

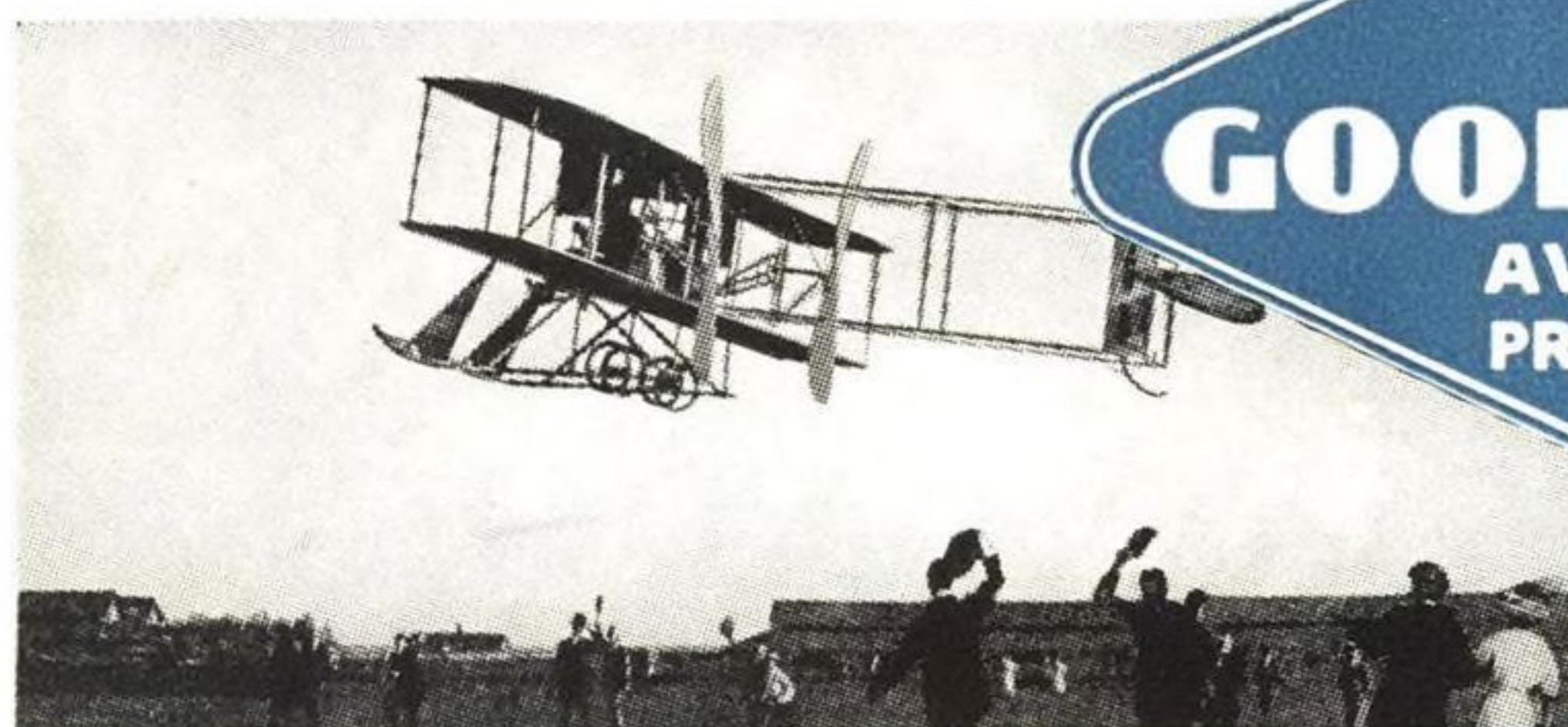
AVIATION WEEK

A MCGRAW-HILL PUBLICATION

NOV. 13, 1950

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Goodyear Wing Tires on Wright Biplane—1910



Goodyear track landing gear on B-36

IT was 1910 when Goodyear organized a special "Aeronautics Department" to supply its newly pioneered pneumatic "aeroplane" tire, wing fabric and other needs for early airplanes built by Wright Brothers, Curtiss, Martin and others. Today, as constantly through the past 40 years, Goodyear continues to pioneer in serving aviation, both civilian and military. Among Goodyear's many contributions to

modern flight are the low-pressure tire, Multiple and Single Disc Brakes, the Cross-Wind Landing Wheel, the endless belt track landing gear, Airfoam cushioning, bullet-sealing and Pliocel fuel tanks, and heated Iceguard wing and propeller boots. This leadership in serving aviation explains why "more aircraft land on Goodyear tires, tubes, wheels and brakes than any other kind."

Goodyear, Aviation Products Division, Akron 16, Ohio or

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VULTEE

DOUGLAS

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GRUMMAN

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McDONNELL

NORTH
AMERICAN

HONEYWELL ELECTRONIC GAGE

NORTHROP

REPUBLIC

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MAJOR aircraft companies have been quick to recognize the vastly improved principle of calculating fuel quantity by weight. As a matter of fact, thirteen manufacturers, representing a total of 33 different aircraft models, already are using the Honeywell capacitance-type electronic fuel gage as standard equipment.

Each application involves individual engineering analysis and installation, resulting in positive assurance that the exacting requirements of each type of ship are met. Exhaustive tests prove the installation. Throughout, complete Honeywell service engineering is furnished.

Only an organization the size of Honeywell is in a position to offer such engineering excellence and such far-reaching service. Investigate! Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 17, Ontario.



Honeywell electronic fuel gage — the first null balance, capacitance-type gage.

Other Honeywell electronic aeronautical equipment includes the famous Autopilot and the turbo supercharger control system.



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Our Octopuller has several new brothers, to help you do more jobs—better and faster. For example, all PROTO* puller screws now have "live center" tips to prevent shaft damage. Five jaws have holes to allow bolting together, thus saving the cost of extra long jaws. These tools and the other pullers illustrated feature the famous PROTO* interchangeability of parts. To save precious hours, grab your hat, hurry to your PROTO* dealer and arm yourself with these new pullers! Write for catalog to

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Bearing
Separator-
Puller Plate



4040-1 to 14
Puller Step
Plates



4022TS
"Live Center"
Screw Tip

*PROTO means **PRO**fessional
TOols. It's the new name for
the tools that have been pre-
ferred for 43 years.



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Executive and Editorial Offices: 330 West 42nd 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 17, 1111 Wilshire Blvd.; San Francisco 4, 68 Post St.; Houston, 514 South St. *Correspondents* in more than 60 major cities.

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Aviation Week November 13, 1950 Vol. 53, No. 20
McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), Founder, Publication office—99-129 N. Broadway, Albany, N. Y. CURTIS W. McGRAW, President; WILLARD CHEVALIER, Executive Vice-President; JOSEPH A. GARRETT, Vice-President and Treasurer; JOHN J. COOKE, Secretary; PAUL MONTGOMERY, Senior Vice-President, Publications Division; RALPH B. SMITH, Editorial Director; NELSON BOND, Vice-President and Director of Advertising; J. E. BLACKBURN, Jr., Vice-President and Director of Circulation. Published Weekly in U. S. A., price 50¢ a copy, 50¢ in Canada. Subscription rates—United States and possessions, \$6 a year, \$9 for 2 yr., \$12 for 3 yr., Canada, \$8 for 1 yr., \$12 for 2 yr., \$16 for 3 yr., payable in Canadian currency at par. Pan American countries, \$10 for 1 yr., \$16 for 2 yr., \$20 for 3 yr. All other countries, \$20 for 1 yr., \$30 for 2 yr., \$40 for 3 yr. Address all communications about subscriptions to 99-129 N. Broadway, Albany 1, N. Y., or Director of Circulation, 330 W. 42nd St., New York 18, N. Y. Please indicate position and company connection on all subscription orders. Allow at least ten days for change of address. Entered as second-class matter, July 16, 1947, at Post Office, Albany, N. Y., under Act of March 3, 1879. Copyright 1950 McGraw-Hill Publishing Co. Cable address "McGraw-Hill New York." 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.



Sunset on June 30th, 500 miles above a point 400 miles WNW of San Francisco

CRASHING THE UNKNOWN!

Solving the "unsolvable" problems of guided missile development is the task of the most brilliant scientific minds in America today. These experts apply knowledge of practically every branch of science. AiResearch engineers and craftsmen are proud to assist them.

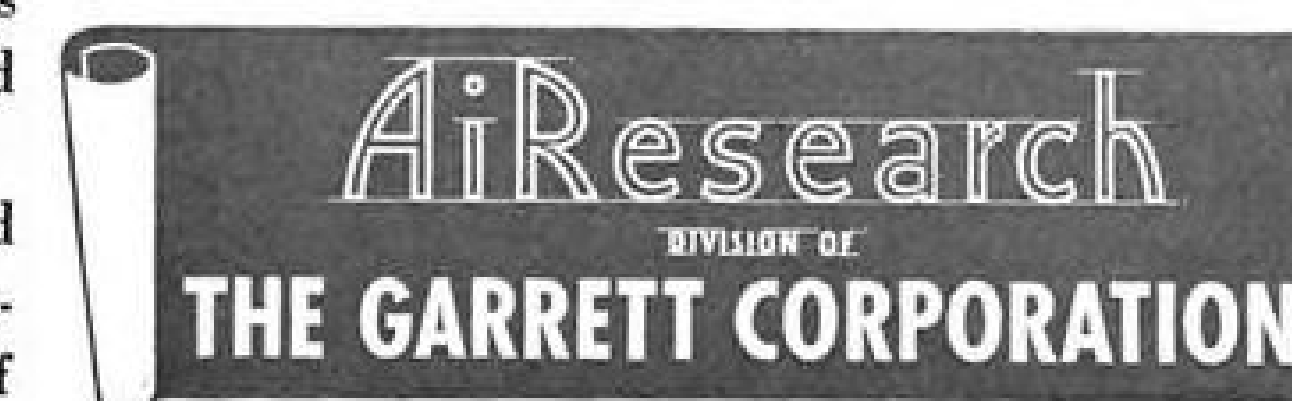
Outstanding contribution of AiResearch in this field is the design and manufacture of auxiliary power "packages." Utilizing hot gases, these units supply a second source of power within the missile needed to operate such vital elements as stabilizers, air surface and guidance controls.

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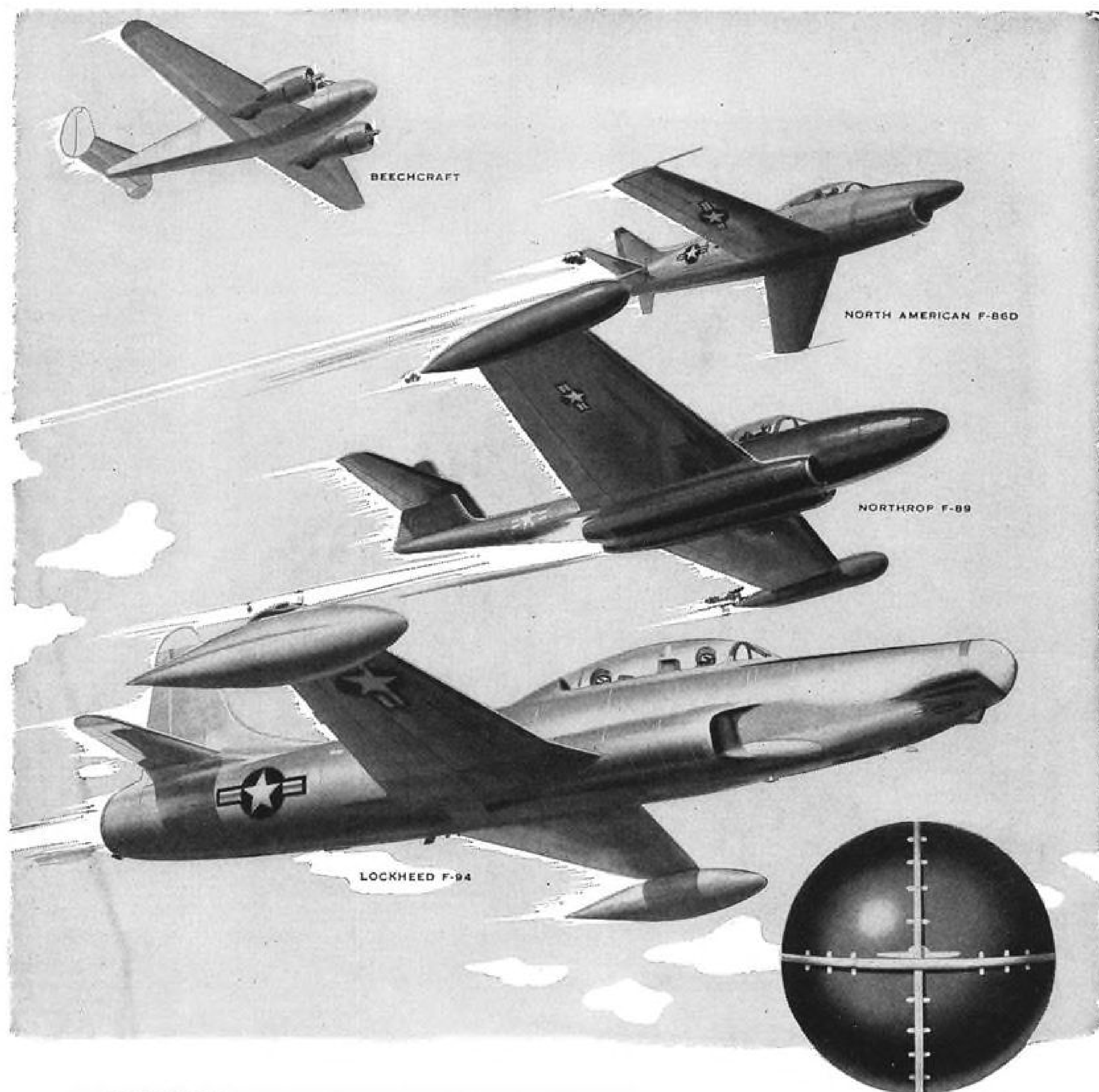
specialized work in the fields of air cycle cooling, heat transfer, pressurization, gas turbines, electronic controls and electrical actuators, AiResearch brings to the missile program knowledge and abilities which are difficult to find elsewhere.

● If you are concerned with any phase of missile development, you are invited to bring your hard-to-solve problems to AiResearch. Here you will find skilled engineers, the most modern equipment obtainable and—

what is most important—the kind of creative thinking that is accustomed to meeting and solving the "unsolvable."



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► The Zero Reader tells the pilot

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NEWS DIGEST

DOMESTIC

Republic Aviation employees decided by a very close 1778-1717 vote to have the International Assn. of Machinists represent them in bargaining.

John Dykstra, Ford vice-president, and Maynard Murray, general manager of Ford's Chicago division, will be key executives in the new Chicago plant which will make P&W R-4360 Wasp Major engines under license. Air Materiel Command has signed letters of intent authorizing the car maker to take over the government-owned plant, with definitive contracts expected to be negotiated by Jan. 1, 1951.

More than 800 hr. of continuous service have been run up by four P&W R-4360s on a Boeing C-97A Strato-freighter operated by MATS Pacific division. Ground crewmen of the squadron to which the plane is assigned completed an engine change in 25 min.

Ernest G. McCauley, for 32 years designer and manufacturer of plane props, has sold his interest in the McCauley Corp., Dayton, and retired to Ft. Lauderdale, Fla. He is credited with much of the original work on hydraulic pitch control props and sold his patents to Standard Steel Propeller Corp., later merged in Hamilton Standard.

Rear Adm. Paul E. Pihl has relieved Rear Adm. Lucien M. Grant as BuAer representative at Wright-Patterson AFB. The Navy has more than 400 people at the base.

First Flight of the experimental agricultural plane developed by Texas A & M's personal aircraft research center will probably take place before or about Dec. 1. Director of the center, Fred E. Weick, reports that the airframe is virtually completely assembled and is undergoing static tests while awaiting the Continental E-185 powerplant.

Monroe R. Brown has been named administrator of research and development for Piasecki Helicopter Corp., reporting directly to Frank N. Piasecki, board chairman. Don Ryan Mockler, public relations director of the Personal Aircraft Council of the Aircraft Industries Assn., will also handle Brown's former duties as secretary of the AIA Helicopter Council.

Brig. Gen. Donald F. Stace is new

chief of Los Angeles AF Procurement Field Office, succeeding Brig. Gen. Thomas H. Chapman. Stace will supervise all AF contracts in Washington, Oregon, Arizona, Idaho, Utah, Nevada, and California.

Smokeless Rato rocket booster has been developed by Allegheny Ballistics Laboratory, Cumberland, Md., under Navy sponsorship. The new rocket motor will be used primarily by carrier planes.

Airlift Task Force organized Aug. 24 to speed cargo and troops to Japan during Korean crisis will be disbanded Nov. 16, with direct control of West Coast Pacific airlift reverting to MATS Continental division to San Antonio.

FINANCIAL

Northrop Aircraft, Inc. estimates fiscal first-quarter profit at \$685,000, equal to \$1.52 per share. Company has working capital of approximately \$6,350,000, and has loan agreement with RFC for maximum credit of \$5,800,000. Under agreement, Northrop can't pay dividends out of capital stock without RFC's consent.

Curtiss-Wright Corp. reports consolidated profit of \$4,962,237 for nine months ending Sept. 30, after provision for taxes, and consolidated net sales of \$98,009,096. Company will pay dividend of 25 cents per share on its common stock, on Dec. 18, to holders of record as of Dec. 6. Wright Aeronautical Corp. reports profit of \$2,837,875 after taxes, and net sales of \$56,521,106, for nine months ending Sept. 30.

Fairchild Engine & Airplane Corp. announces dividend of 40 cents per share payable Nov. 28 to stockholders of record on Nov. 14. This brings dividends for the year to 60 cents, with prior 20-cent payments last June.

INTERNATIONAL

British Guided Weapons Office is counterpart of newly created U. S. Dept. of Defense Office of Guided Missiles. British agency was created to speed missile research, development and production, under direction of Air Chief Marshal Sir W. Alec Coryton.

British European Airways twin-engine Viking crashed in ground-controlled (radar) landing at London Airport on trip from Paris to Northolt Airport, killing 28 of the 30 aboard.

WHEREVER YOU GO
WHATEVER YOU FLY



THERE IS
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THE ARC TYPE 11A

Meets your basic navigation and communication needs. Provides for VHF transmission, LF range reception and rotatable loop navigation.

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Adds two-way VHF communication. System includes tunable VHF receiver and a five-channel, crystal controlled VHF transmitter. As many as four of these transmitters may be installed providing up to 20 channels.

THE ARC TYPE 12



Gives you the combined advantages of the type 11A and the Type 17 systems. You get two-way VHF communication and LF range reception, as well as rotatable loop navigation.

Ask about ARC Type 15B Omni-range equipment and ARC's 10-channel Type F11 Isolation Amplifier. Write for all the details.

All units of these systems are type certified by the CAA. Installations for both single and multi-engine planes are made only by authorized agencies.



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EXAMPLE PROJECTS

*10

THIN SHEET METAL BUTT WELDS

Problem:

To avoid objectionable overlapping resistance welded seams in long thin stainless sheet fabrication.

Solution:

Construction of copper quenching, machine heliarc mandrels with cushioned clamping arrangement to hold butting edges in identical plane alignment.

Result:

Beautifully fused and flawless butt welded seams retaining full tensile values across the joint.



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AVIATION CALENDAR

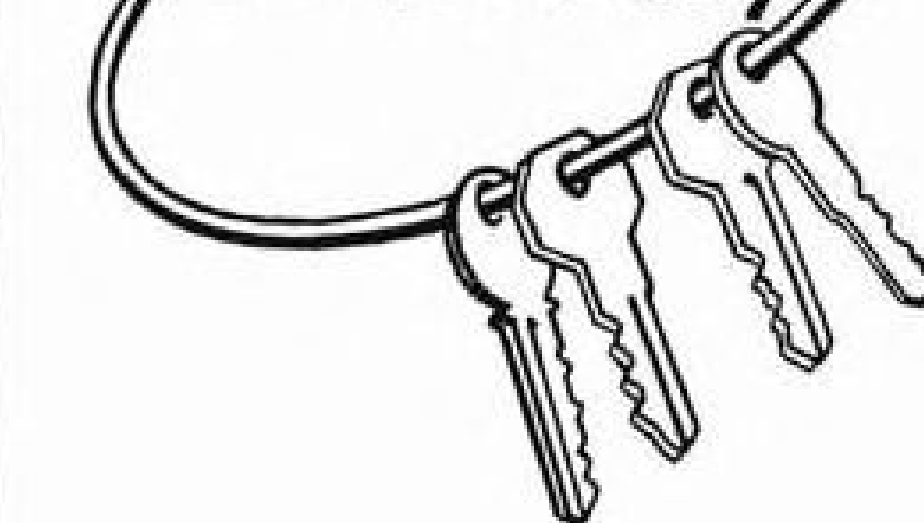
- Nov. 14—ICAO rules of the air and air traffic control meeting, fourth session, Montreal, Canada.
- Nov. 23-26—Snowbird Soaring Meet, sponsored by Elmira Area Soaring Corp., Elmira, N. Y.
- Nov. 26-Dec. 1—71st annual meeting, American Society of Mechanical Engineers, Hotel Statler, New York.
- Nov. 28-30—Airport fire safety clinic sponsored by the National Fire Protection Assn. committee on aviation and airport fire protection, Baker Hotel, Dallas.
- Nov. 29-Dec. 1—Eighth annual meeting of Aviation Distributors and Manufacturers Assn., Ambassador Hotel, Los Angeles.
- Nov. 30—Airport fire safety clinic, sponsored by Committee on Aviation and Airport Fire Protection of the National Fire Protection Assn., Baker Hotel, Dallas.
- Dec. 7-8—Auction sale of aeronautical books, furniture, paintings, prints and furnishings, Plaza Auction Rooms, 9 E. 59 St., New York.
- Dec. 8—Aviation Associates show and dance, Town Hall, Philadelphia.
- Dec. 16—14th Wright Brothers Lecture, Institute of Aeronautical Sciences, U. S. Chamber of Commerce Auditorium, Washington, D. C.
- Jan. 2-7, 1951—Miami Aviation Week, Miami, Fla.
- Jan. 6-7—Florida Air Pilots Assn. air show and exposition of planes and equipment, Opa Locka Airport, Miami, Fla.
- Jan. 8-10—Eighth annual air cruise Miami-Havana, and return, of Florida Air Pilots Assn.
- Jan. 15-18—Plant maintenance show and concurrent conference on plant maintenance techniques, Cleveland, Ohio.
- Jan. 29-Feb. 1—19th annual meeting of the Institute of Aeronautical Sciences, Hotel Astor, N. Y.
- Mar. 19-23—Seventh Western Metal Exposition, Oakland Auditorium and Exposition Hall, Oakland, Calif.
- Apr. 24-26—ATA annual engineering and maintenance conference, Hotel Drake, Chicago.
- June 11-15—Second annual conference on industrial research, conducted by Columbia University Dept. of Industrial Engineering, New York.
- Sept. 7-11—Third annual Anglo American Aeronautical Conference, convened jointly by Royal Aeronautical Society and IAS, Brighton, England.
- Sept. 10-14—Sixth national instrument conference and exhibit, sponsored by Instrument Society of America, Sam Houston Coliseum, Houston, Tex.

PICTURE CREDITS

7—(top) USN, (center) INP, (bottom) Glenn L. Martin Co.; 12—(top) Glenn L. Martin Co., (bottom) McGraw-Hill World News; 13—B-45, NAA; 15—McDonnell Aircraft; 18—Howard Levy; 22-25-26—Fairchild Aircraft; 32—Roy Croft; 39—NACA.

LOCKSMITHS

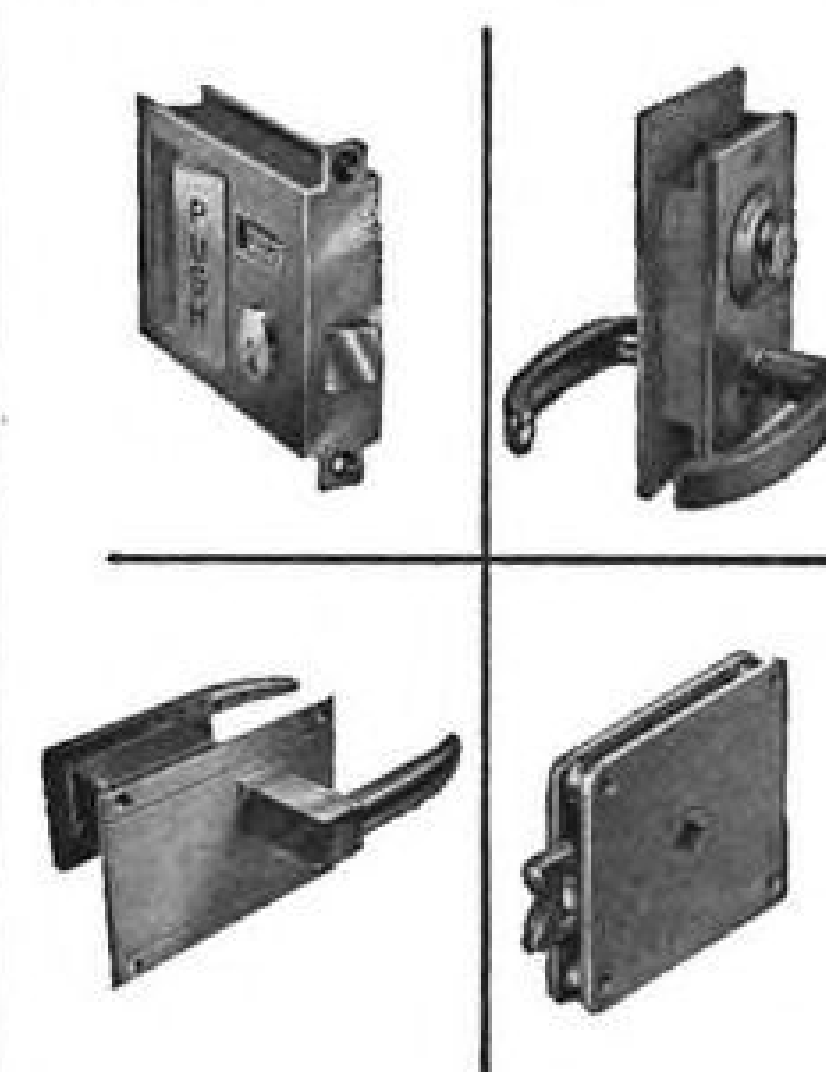
to the Industry



Adams-Rite is headquarters for locks, latches and closures for securing fuselage, compartment, lavatory, galley and bulkhead doors.

We manufacture over 600 separate locking devices which are regularly specified and used on 80% of aircraft in service today. In addition, Adams-Rite engineers are always available to design any type of lock, latch or closure to meet your specific requirement — a service backed up by experience in designing more than 3500 individual locks and latches since 1927.

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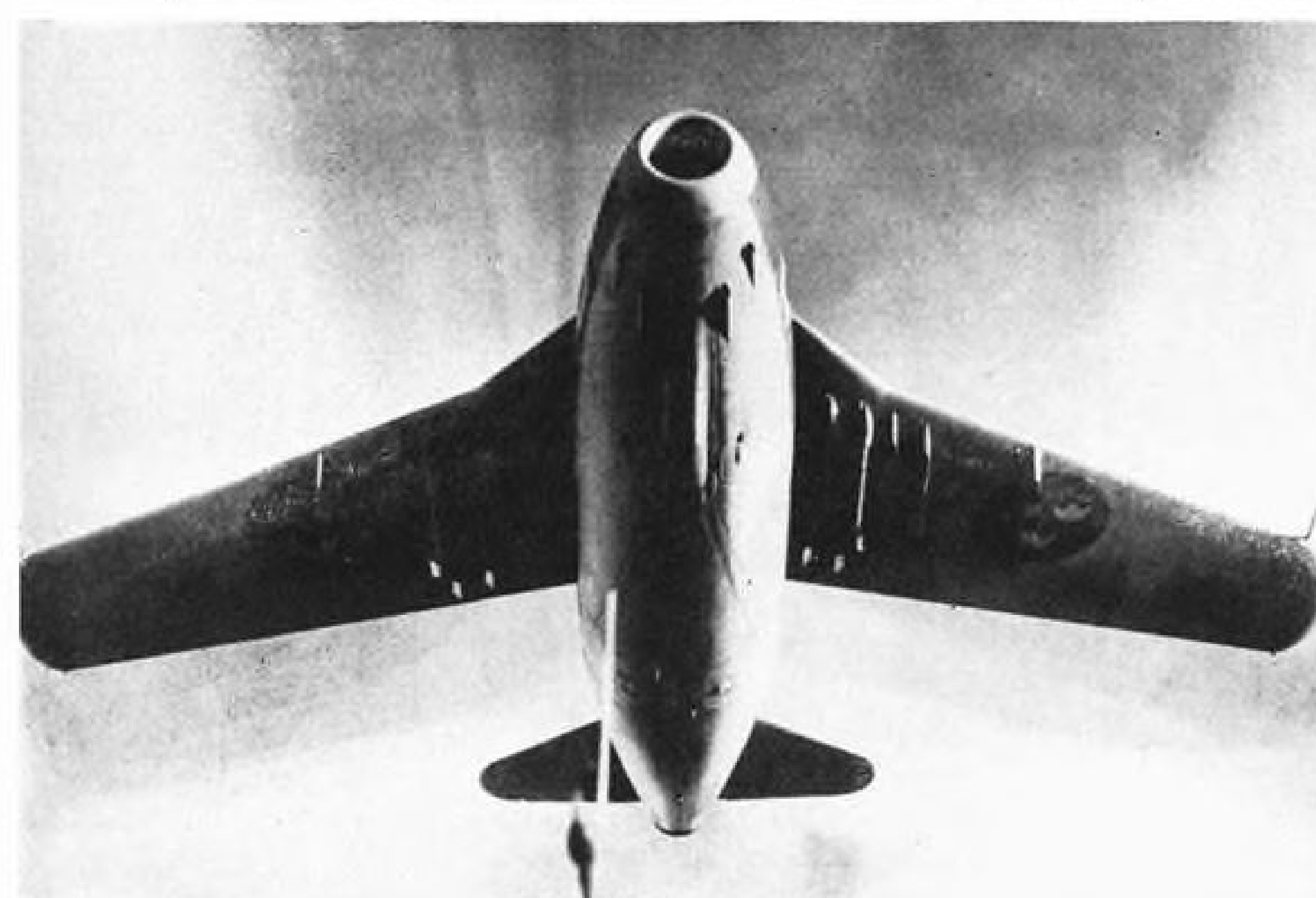
Adams-Rite locks, sanitary plumbing and Wedjits are designed and built for aircraft use exclusively! Insist on genuine factory equipment for replacement or when converting or modernizing aircraft. Both in first cost and in upkeep you'll find it cheaper to do business with Adams-Rite. (For Wedjits outside California, please contact United-Carr Fastener Corp. who are licensed manufacturers.)



AVIATION WEEK, November 13, 1950



NAVION AT SEA—Ryan L-17 Navion plays a new role in Korean operations as it leaves the deck of the escort carrier USS Badoeng Strait to observe amphibious operations. Success of ground forces permitted the pilot to land ashore, instead of on the carrier.



News Picture Highlights

SWEDISH ROCKETEER—This unusual view of the Swedish SAAB J-29 jet fighter shows up the stubby craft's planform. Recently added have been the eight rocket-firing mounts beneath the wings near the fuselage. The 600-mph.-plus fighter is powered by a DH Ghost. The Swedish Air Force has ordered 500. Main armament consists of four 20-mm. nose cannon.



MERCATOR TRIO—Navy pilots try their hands at flying a formation of recently delivered Martin P4M-1 long-range patrol planes

in service with VP-21 based at Patuxent River, Md. Two P&W R-4360s and two Allison J-33s give an impressive performance.

AVIATION WEEK, November 13, 1950

Two metals for high temperatures

INCONEL

INCONEL "X"

Offering exceptional hot strength and high corrosion-resistance, these high-nickel alloys solve aircraft "hot-spot" problems.

The extremely high temperatures generated within jet and gas-turbine power units are among today's most challenging aircraft engineering problems.

Relatively few materials are able to withstand the destructive combination of high temperatures, corrosive combustion products, and high stresses. Still further complicating the problem...many otherwise satisfactory materials are impractical either because of high cost or inherent lack of workability.

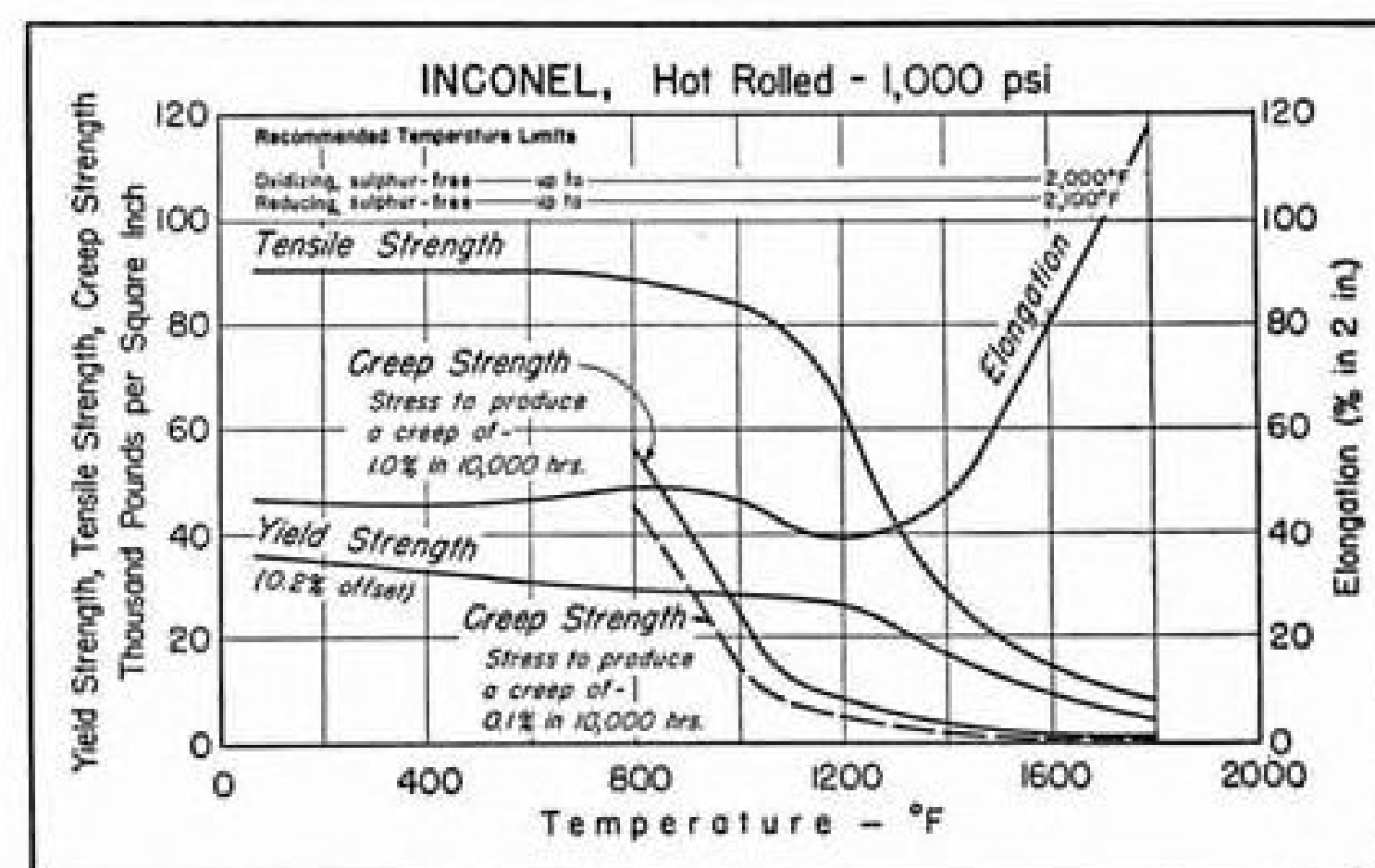
Among the few materials to show satisfactory performance in jet and gas turbine applications are *Inconel*® and *Inconel "X"*®. Both alloys have excellent resistance to corrosion and destructive oxidation at temperatures up to 2000° F. Both alloys are workable. And both alloys are practical in cost.

Inconel serves best where a high degree of oxidation resistance is required and where moderate hot strength is sufficient. Typical applications are—jet burner liners, exhaust systems, heater combustion chambers.

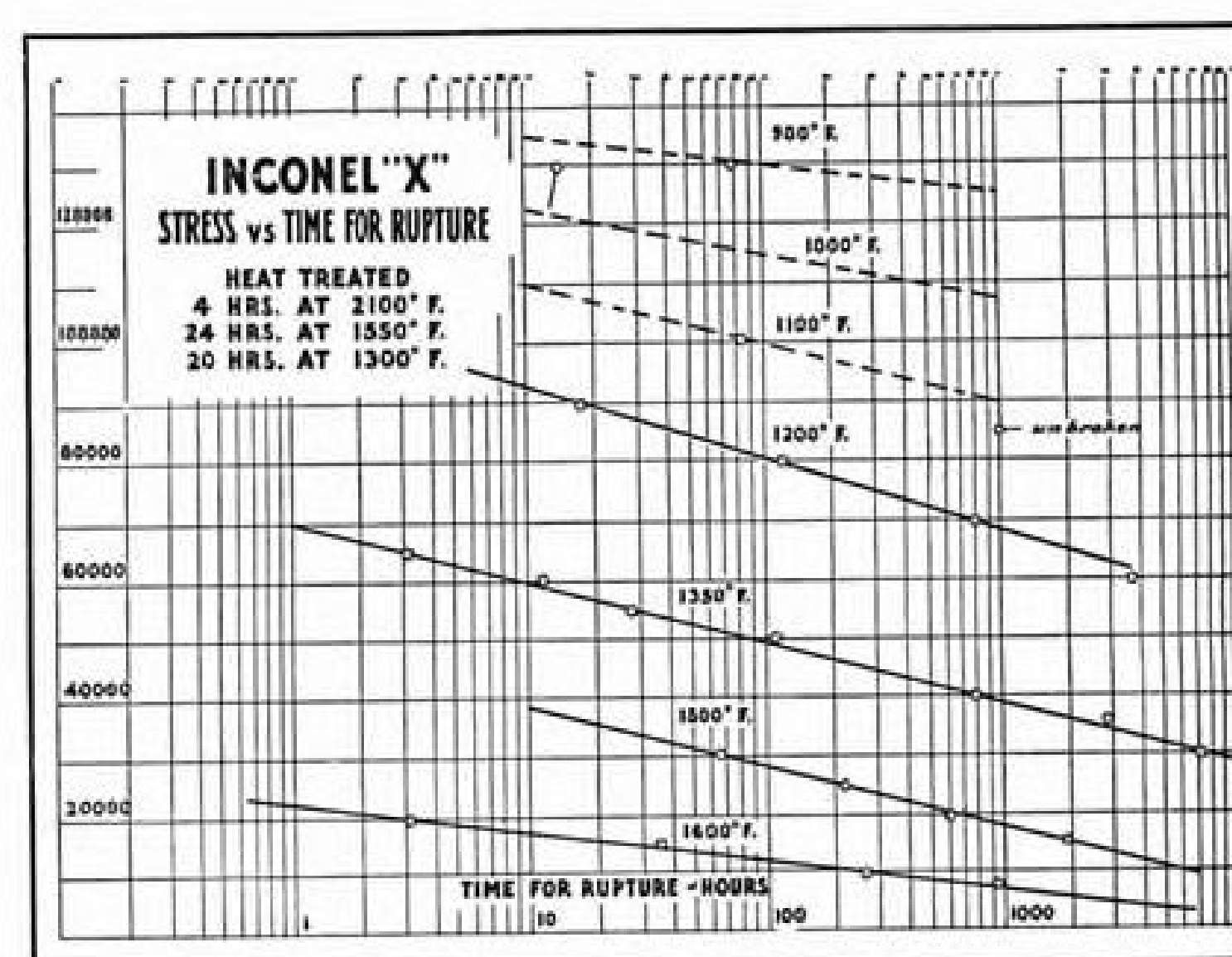
Age-hardenable *Inconel "X"* offers much higher hot strength up to 1500° F, in addition to oxidation-resistance, making it useful for turbine wheels, turbine blades, high-temperature structural members and fastenings, and for springs up to 1000° F.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York 5, N. Y.

INCONEL...for long life at high temperatures



INCONEL provides an economical answer to high-temperature metal problems where moderate hot strength is adequate.



INCONEL "X" is age-hardenable and offers exceptional mechanical properties as well as high resistance to destructive corrosion.

Write, today, for full engineering information about these heat-defying alloys. And remember...our Technical Service Department is always ready to help you solve metal-selection and fabrication problems.



WHO'S WHERE

In the Front Office

Fred T. Smye has been named a member of the board and executive vice president of A. V. Roe Canada, Ltd., Malton, Ontario. He was previously assistant general manager. Smye was Avro Canada's first employee, joining the company after World War II. During the war he held positions in the Canadian Department of Munitions and Supply, aircraft committee of the Joint U. S.-Canada Production Board, and was assistant general manager of Federal Aircraft, Ltd.

Raymond W. Young has been appointed vice president in charge of engineering for Reaction Motors, Inc., N. J., and has also been recommended for a membership on the company's board. John Shesta was named vice president heading up research and continues as a director of RMI. Young was formerly vice president-engineering for Curtiss-Wright; Shesta is one of the founders of Reaction Motors.

What They're Doing

Leo G. Sands has been named staff assistant to the general sales manager of Bendix Radio Communication division of Bendix Aviation Corp. . . . Fred C. Weigold has been appointed production manager for Airborne Instruments Laboratory, Mineola, N. Y. . . . L. A. Carlson has been made project engineer for Westinghouse Air Brake's aircraft division. The division has appointed as new field and service representatives: H. W. McCracken, N. Y.; D. R. Read, Dallas; D. S. Permar, Cincinnati; E. L. Holbrook, Washington; J. F. Graham, Los Angeles; and R. K. Whittlesey, Seattle.

Howard Holmes has been made general manager of development for Simmonds Aerocessories, N. Y. The new assistant manager for the firm is G. J. McCaul. . . . Norman L. Winter has been appointed director of special electronic sales for Sperry Gyroscope Co. . . . E. Van Vechten has been made manager of stores and purchasing at the Glendale plant of Grand Central Aircraft Co. . . . C. M. Harmon has joined Lockheed Aircraft Service as manager of accounting and finance. . . . David Shawe, formerly of American Aviation Associates, is now general manager of a new western area office for the Air Force Assn. at 3974 Wilshire Blvd., Los Angeles. . . . Alwin A. Gloetzer has been appointed Washington, D. C. consultant to New Departure division of General Motors.

Honors and Elections

J. H. Carmichael, president of Capital Airlines, has been awarded a plaque by the Washington Board of Trade for "his outstanding contribution to the transportation industry by introducing air coach to scheduled airlines."

Ralph R. Layte, president of Purolator Products, Inc., Rahway, N. J., has been honored by the company on completion of 25 yr. of service with the concern.

INDUSTRY OBSERVER

► Canadair, Ltd., after building one F-86A jet fighter, will not make any more F-86s until it gets complete engineering changes and data from North American for the later F-86E model of the fighter, which will be the production model for Canadair.

► Titanium will be used for an experimental guided missile wing and for the complete aft fuselage section of a jet fighter, in experiments at Air Materiel Command's aircraft laboratory. Rivets, forgings and sheet will all be titanium. High strength-to-weight ratio of titanium and its heat-resistant qualities are advantages which indicate it will be a primary aircraft structural metal, whenever supply is stepped up and price drops. Large-scale production is expected to bring ingot prices down possibly to \$1 a lb.

► Navy is considering more powerful engines for the Douglas F3D night fighter, which Navy pilots consider somewhat underpowered with its present two Westinghouse J-34-WE-38 engines, rated at 3600 lb. thrust each.

► Two front tires of the bicycle landing gear of a Martin XB-51 were blown out in a hard landing on the runway of the Martin plant a few weeks ago. Damage was confined to the tires and to two skin panels. Plane was flying again a few days later.

► Next step in large military assault helicopter development will be to twin-engine machines. Several proposals in the recent anti-submarine and Arctic rescue competitions suggested twin engines, but both Air Force and Navy settled on single engine designs. Kellett and McDonnell's experimental prototypes and the big Piasecki XH-16, not yet assembled, are the only twin-engine craft announced so far, in this country. A twin-engine machine which would haul about 15 to 20 men may be the next step up in size.

► An experimental Fairchild C-119 Packet powered with Wright R-3350 engines, instead of the Pratt & Whitney R-4360 powerplants now standard, may mean a switch in powerplants for the military cargo plane.

► A long-range fighter-bomber version of the sweptwing North American F-86 is another entry in the ground support sweepstakes. It will be loaded with four external fuel tanks in addition to its regular internal capacity, and will carry a heavy armament of either rockets or bombs. It will also be quickly transformable to its original day interceptor fighter role.

► Beech Aircraft has delivered its 15th Model 18 twin transport to the Netherlands government civil flying school, for twin-engine pilot training. School provides pilots for Netherlands air force and KLM Royal Dutch Airlines.

► Aircraft companies are looking hopefully at the Lustron plant at Columbus, adjoining the Curtiss-Wright plant which North American Aviation is taking over. If RFC lets go of the Lustron facility built in World War II, it may be occupied by aircraft production again. War Production Board at the end of World War II recommended that it be held available for aircraft production if needed.

► Aircraft Industries Assn. has been supplying Department of Defense with weekly reports from principal manufacturers on cost data, in an effort to keep a close check on rising parts and accessories and materials costs.

AF Shopping for Troop Support Bombers

XB-51, B-45, AJ-1 and British plane are Chief entries in evaluation.

By Alexander McSurely

Substantial new Air Force production contracts will be the prize for the winner or winners of the light bomber evaluation now in its early stages. Four planes are involved in this examination of low-flying troop support craft.

English Electric Co.'s Canberra Mark II, the sensational high-performance British light bomber, is a dark horse competitor in the evaluation, against three American entries. These are:

- **Martin XB-51** sweptwing three-jet bomber.
- **North American B-45** four-jet bomber, now in service.
- **North American AJ-1** composite-powered Navy attack bomber.

Air Force pilots, including Brig. Gen. Al Boyd, commander of Edwards AFB, Muroc, Calif., have already flown a preliminary testing program in the Canberra in England. But it is understood that one of the planes will be brought to this country for further flight tests.

► **B-45 Service Evaluation**—The North American B-45 will be evaluated on the basis of its performance in service, since it is the only one of the four planes which is now flying in squadrons for the USAF.

There are two XB-51 prototypes now flying. One or possibly both of these will be used for the evaluation, either at Eglin AFB, Fla. or at Edwards AFB.

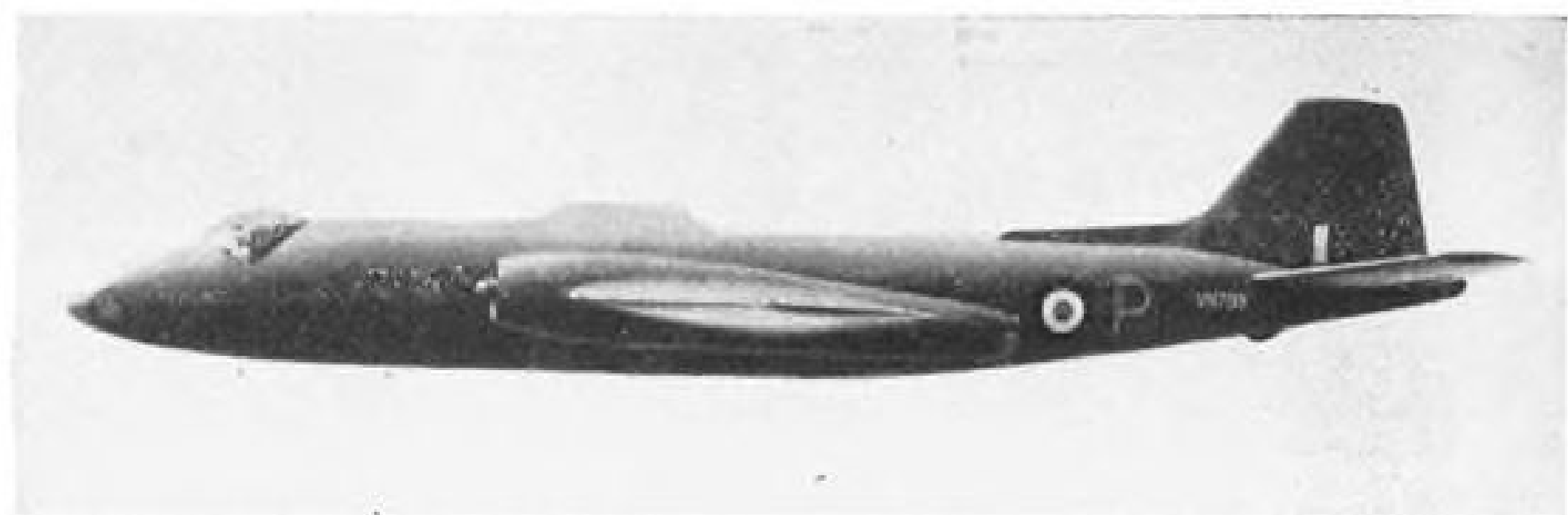
Air Force pilots were expected to make a preliminary evaluation of the AJ-1 soon, probably at the Western Flight Test Base at Muroc.

► **Canberra Contract?**—Pentagon sources indicate that the Canberra will probably get a fair-sized contract and that one of the three American planes will get the rest.

The unorthodox Martin plane which has a variable incidence wing, was specifically designed as a low-level troop support bomber for operation out of advanced bases. Although it made its first flight a year ago, Martin has never received an additional order for even a service test quantity. This is probably due to the fact that Air Force was placing its primary emphasis on strategic bombers and interceptors, and putting the tactical types of planes well down



MARTIN XB-51—Climbing in popularity among Army officers seeking ground support plane.



CANBERRA—Dark horse with bright performance is an odd-on favorite in Pentagon.

on the priority list. Now that picture has changed.

► **Army View**—Army tacticians have indicated they like the XB-51 and would like to have it or something like it for their troop support work (AVIATION WEEK Oct. 2). They have recommended that, if it cannot be procured, certain design features of the plane be incorporated into the B-45, a current production light bomber.

Air Force interest in the AJ-1 Navy carrier-based bomber as a possible alternative for the troop support role has been kept quiet. But early performance reports on the first AJ-1s now going into carrier service have caused the Air Force to take a good look at it anyway. Probably the slowest of the four competitors the AJ-1 uses two piston-engine Pratt & Whitney R-2800s for its normal cruising. Then the pilot can kick up the speed to around World War II fighter maximum performance, well over 400 mph. when he fires up an Allison J-33 jet engine in its tail for combat (AVIATION WEEK Nov. 6).

There are approximately 150 North American B-45s now flying for the Air Force. The airplane has been developed

considerably beyond its early capabilities, particularly as to range by addition of external tanks and other modifications. The airplane is currently out of production.

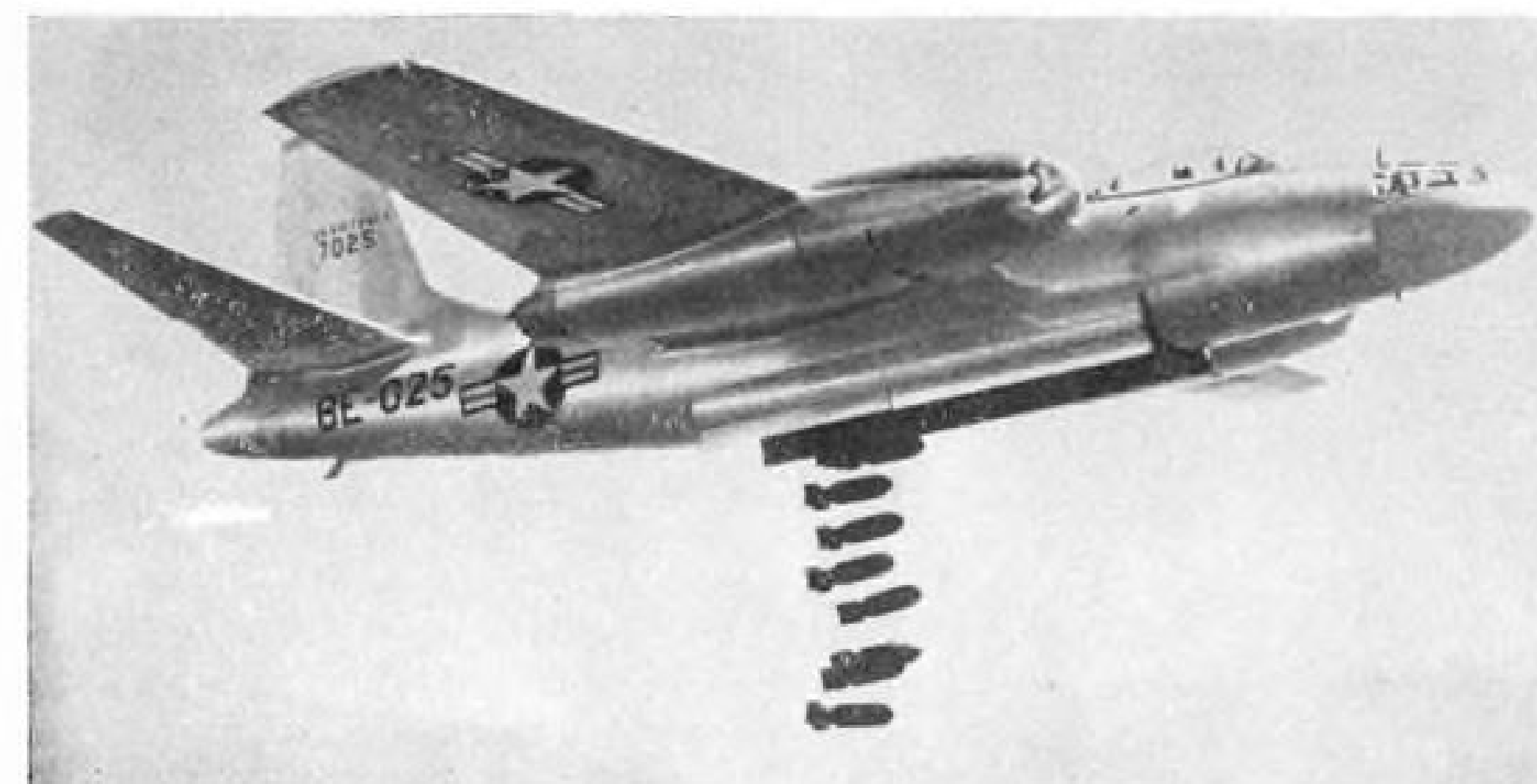
Here are brief thumbnail descriptions of the four contenders:

• **Canberra Mark II.** A two-jet plane powered with Rolls-Royce Avon engines rated at around 7500 lb. thrust each. Dimensions are: Span 64 ft., length 65 ft. 6 in.; height 15 ft. 7 in. Gross weight and performance data have not been made available, but the plane is fast, well up above 500 mph., and extremely maneuverable for its size. Its standard demonstration includes most normal fighter maneuvers. Besides large fuselage fuel tanks, it can be fitted with large wing-tip tanks to extend range. It flies well, too, at slow speeds, below 100 mph. It was originally designed as a radar bomber for 50,000-ft. altitude operation, but has proved equally suited for low-level operations.

• **North American B-45.** Powered with four GE J-47 axial-flow turbojets rated at 5200-lb. thrust each. The straight-winged B-45 is capable of speeds in the 550-mph. range and has a tactical radius



NORTH AMERICAN AJ-1—Navy-sponsored, but it looks good to the Air Force anyway.



NORTH AMERICAN B-45—Out of production, but in the running for large new contracts.

of over 800 miles. Gross weight is about 82,000 lb. Wingspan is 89 ft. 6 in.; length, 74 ft., and height, 25 ft. The plane is fitted for wingtip tanks, thus greatly extending its present range, while some of the planes that are now in service have been modified for photo reconnaissance work. It carries a crew of four.

• **Martin XB-51.** Powered with three GE J-47 turbojets rated at 5200-lb. thrust each, the XB-51 is the fastest of the entries in the evaluation with a top speed reported over 600 mph. Gross weight is about 45,000 lb. Wingspan is 55 ft.; length, 80 ft.; height, 17 ft. Wing and tail have about 35-deg. sweep-back.

The angle of incidence of the wing can be changed by a mechanism controlled from the cockpit. Main landing gear is a tandem installation in the fuselage consisting of two pairs of wheels, while small auxiliary wheels retract into the wingtips. Two engines are mounted on pylons extending from the fuselage just below the wing. The third engine is mounted in the tail of the ship. The plane carries a crew of two.

UAL Sues Douglas for DC-6 Crashes

Two United Air Lines' suits against Douglas Aircraft Co. for a total of \$9,720,565, in New York State Supreme Court, have recently been disclosed. They allege that deficiencies in four-engine Douglas DC-6 airplanes were factors responsible both for the 1947 Bryce Canyon, Utah, and also the 1948 Mt. Carmel, Pa., United accidents.

United filed the first suit for \$6,926,000 Oct. 22, 1948. UAL says its 35 DC-6s did not meet CAA requirements as to the fuel vent system. Direct result was the Bryce Canyon crash, United says. UAL claims Douglas admitted this when it later changed the vent system on all DC-6s, grounding the planes for an average of 175 days.

United filed the second suit June 8, 1950, for \$2,794,565, saying that when Douglas modified the planes after the grounding, it made several changes that eventually caused the Mt. Carmel crash.

Douglas denies formal or legal responsibility for the accidents. Douglas points out that DC-6s are in world-

wide service and to date have logged more than 12 billion safe passenger miles.

Civil Aeronautics Administration certified airworthiness without catching the possible dangers of the DC-6 fuel vent location. This, CAA says, was because the fuel exchange that poured raw gasoline out the overflow was not an approved flight procedure, and so was not discovered during routine flight tests.

United Air Lines is the only airline suing Douglas on the DC-6 matter, although others lost money during the DC-6 grounding. CAB, in granting retroactive mail pay increases, put in a clause providing that the back pay would be effective only if other sources of compensation to the carrier were exhausted.

NAC Awards

National Air Council scheduled its delayed 1950 awards to two researchers of the Air Force and Navy Bureau of Aeronautics for presentation Nov. 8 by Defense Secretary Marshall at the Pentagon.

Awards went to:

- **Capt. James L. Hight, USAF.**
- **Rear Adm. Calvin M. Bolster, Navy Bureau of Aeronautics.**

Capt. Hight received his award for "developing a basic multi-purpose and highly flexible aerial delivery system capable of delivering, ready for operation, the majority of vehicles, artillery, anti-tank and anti-aircraft weapons" used by Army airborne divisions.

Adm. Bolster's award was for specific projects which were not disclosed due to security reasons.

Nichols Named As OGM Deputy Head

Maj. Gen. Kenneth D. Nichols, wartime director of the atomic "Manhattan Project," last week was named deputy director for Defense Department's new super-agency, Office of Guided Missiles, confirming an earlier story (Oct. 30) in AVIATION WEEK of the impending appointment.

Gen. Nichols was chief of Armed Forces Special Weapons Project and senior member of the Military Liaison Committee to the Atomic Energy Commission prior to this assignment. He will be deputy to K. T. Keller, named Oct. 26 by Defense Secretary George C. Marshall to direct the coordination of this nation's guided missile development and production.

Nichols will set up the actual operating machinery of the new office while Keller as director will serve on a part-time basis in an advisory capacity to Secretary Marshall.

Army Due to Buy More Planes

Joint Chiefs of Staff decision expected to let ground forces order transports, fighters, copters, bombers.

By Ben S. Lee

Decision of the Joint Chiefs of Staff scrapping present Army-Air Force regulations (AVIATION WEEK Oct. 2) which set weight limits on army procurement of aircraft is imminent. Current maximum weight limits for Army procurement are 2500 lb. for airplanes and 4000 lb. for helicopters.

With the decision, far-reaching shifts in the military aircraft procurement picture—affecting transports, fighters, liaison planes and helicopters—will begin as Army moves into tactical aviation.

► **Probable Prescription**—The Joint Chiefs will probably prescribe:

- **Assignment of tactical air groups to Army command.** Current thinking is to correct existing "command" relations between services, not to create an Army tactical air force. Tactical air forces in support of armies will be placed under Army command instead of being offered for "cooperation whenever the over-all air situation permits."

- **Authorization to establish an Army Air Logistics Support Group.** Army wants an Air Group to provide for its internal needs much in the same manner

as Navy's Fleet Air Logistics Support Wing does while strategic airlift is, and can be, adequately administered by MATS. Army has an urgent need for a compact air transport group to meet its own logistical needs.

- **Reorganization of the Army Airborne Center** as a joint test facility with command status. This reorganization will place Army in position to enforce its requirement for tactical aircraft and utilization. USAF is currently in control of development and procurement, and tactical employment. Tactical support plane design presently meets USAF requirements first and Army's needs second.

- **Army Ready**—Already functioning is the Army Airborne Center at Ft. Bragg, N. C. As presently constituted, the center has no command function. Its director, Maj. Gen. Robert M. Miley, now only "assists the Chief of Army Field Forces, in discharging his responsibilities in airborne matters."

Organization of the Airborne Center came as a direct result of an Army Airborne Panel's January, 1950 recommendation for its establishment to aid development of a modern airborne fight-

ing force. Original proposal to ease the joint problems of tactical air support was advanced two years ago by Army field forces which had pleaded for organization of a joint airborne test center.

Proposed mission of the Joint Army-Navy-Air Force Airborne Center was to foster advanced airborne techniques, doctrine, tactics, and development of weapons and equipment for airborne operations common to all three services. Air Force demurred and the joint plan was shelved for the time being.

► **Command Status**—The probable JCS decision to cancel present Army aircraft procurement, plus the increased emphasis placed by the services on tactical air support, will undoubtedly also see raising the airborne center to command status. It similarly will signal its reorganization as a "joint" facility.

With its organization as a joint facility, Army requirements in the field of tactical aviation, now treated as "suggestions," will become commands in reference to medium transports, helicopters, fighters and fighter-bombers as they relate to ground support.

Army planners feel that aircraft employed in tactical support operations must be specialized from point of design to meet Army requirements.

Specifically Army is interested in:

- **Light bomber.** Glenn L. Martin Co.'s three-jet-engined XB-51 is favored by Army as the nearest approach to its requirements as a tactical air support weapon. Air Force has already ordered evaluation of the XB-51, the North American B-45, the North American AJ-1 and the British Electric Co. Canberra II (See AVIATION WEEK, page 12).

- **Fighter.** McDonnell's XF-88 Voodoo, Westinghouse-powered twin-jet fighter is still considered by Army to be the best answer to its tactical support fighter need. Lockheed Aircraft and USAF are trying to convince Army that the F-94C can fill the bill. Prime consideration Army asks in a fighter design is range and endurance; second, fire-power; third, speed.

- **Transport.** Three types of transport are needed by Army—utility, cargo and assault. Army is presently developing new requirements for its own twin-engine utility transports for personnel transfer and is secretly examining several twin-engine types. Among them are Consolidated-Vultee 240 (USAF T-29), Martin 4-0-4. Also being considered is the possibility of acquisition of some Douglas Super C-47 transports.

In the cargo transport field Army will have a lot to say about load and unload characteristics but basic configuration and design engineering will remain primarily under USAF control since this overlaps into strategic airlift.

Army has already made its demands felt in assault transport needs, and its

The MIG-15

First reports of Russian-built, sweptwing jet fighters now operating against UN forces in Korea identified some of the planes as MIG-15 interceptors. For a detailed story on this latest Russian service type, read the authentic analysis on page 36 of this issue.

requirements in this field will continue to increase for planes such as the YC-122 and XC-123.

- **Helicopters.** Probably most important in current Army planning is the future role of the helicopter in liaison, transport and assault operation. Long eager to share in Marine Corps development of the assault helicopter, Army will place heavy pressure on helicopter development. Army considers the Piasecki XH-16, a helicopter with a fuselage compartment the size of a C-54, the probable answer to its assault transport needs for the next decade.

- **Liaison.** Army tacticians predict early replacement of the fixed-wing liaison aircraft with smaller helicopters for forward combat use in the near future because of greater flexibility of copters. For rear action command liaison, however, Army still favors the fixed-wing plane. Trend in this field is away from the light "artillery spotter" plane and towards heavier, faster, multi-place personnel transports.

- **Liaison Competition**—Indicative of this latter is the liaison-type competition ordered by USAF and set to begin early in December at Wright-Patterson AFB, Ohio. Contract plum dangled before competitors is an award for "approximately 300 planes" to the winner.

Entered are: Cessna Aircraft Co.; Fletcher Aviation Corp.; Piper Aircraft Corp.; Ryan Aeronautical Co.; Helio-plane Corp.; Taylorcraft, Inc.; Bellanca Aircraft Corp.; Aero Design and Engineering Corp.; Montagu Aircraft Co.; Monocoupe Airplane and Engine Corp.; Meyers Aircraft Co.; Goodyear Aircraft Corp.; Mooney Aircraft, Inc.; Aerobat and Aquafight, and de Havilland Aircraft of Canada, Ltd.

Where Construction Money Will Go

The first detailed listing of major construction projects for Army and Air Force out of fiscal 1951 funds has been disclosed by Army Corps of Engineers.

The listing includes approximately \$209 million for 210 projects.

Showing expansion of Air Force facilities and rocket development and testing facilities of both USAF and

Army is the fact that more than one-half of the total funds set aside are for that purpose.

Two-thirds of the initial phase of 1951 program (approximately \$135 million) is for construction, principally in Alaska. Award of individual contracts will be made to the lowest responsible bidder after public advertising, and will be made through organization of the Division and District Corps of Engineers.

Air Force facilities which are due for expansion and new construction are:

- **California,** Fairfield-Suisun AFB, \$1,796,800; Muroc AFB, \$1,344,000.
- **Florida,** Eglin AFB, \$7,550,000.
- **Kentucky,** Campbell AFB, \$60,000.
- **Maine,** Limestone AFB, \$7,929,416.
- **Michigan,** Selfridge AFB, \$315,336.
- **Montana,** Great Falls AFB, \$2,329,000.
- **Nebraska,** Offutt AFB, \$300,000.
- **Ohio,** Wright-Patterson AFB, \$782,000.
- **South Dakota,** Rapid City AFB, \$410,100.
- **Texas,** Carswell AFB, \$495,000.
- **Washington,** McChord AFB, \$348,337; Larson AFB, \$3,987,000; Spokane AFB, \$3,455,100.
- **Alaska,** Eielson AFB, \$26,141,000; Ladd AFB, \$14,671,900.
- **Kenai (Pacific Island),** \$7,000,000.
- **Bermuda,** Kindley AFB, \$1,500,000.
- **Miscellaneous locations** both in the U. S. and outside continental U. S., for airway navigational aids, \$4,898,093.
- **Repair and replacement of airfield lighting,** \$750,000.

Rocket facilities which are due for expansion and new construction are:

- **Alabama,** Redstone Arsenal, \$4,272,600.
- **California,** California Inst. of Technology, \$608,000.
- **Maryland,** Aberdeen Proving Ground, \$2,914,000; Camp Detrick, \$6,567,000.
- **New Mexico,** White Sands Proving Ground, \$2,460,400.
- **New York,** Malta Test Station, \$840,000.
- **New Jersey,** Picatinny Arsenal, \$268,000.
- **Utah,** Dugway Proving Ground, \$8,695,159.



JET NOISE ABATEMENT

Strident clamor of jet engines running up at McDonnell Aircraft Corp. is being muted by some new hush boxes designed to win friends among neighbors of the McDonnell plant at Lambert-St. Louis Municipal Airport. Tailpipe muffling units shown above are elliptical chambers, lined with sound-absorbing materials. Meanwhile water injection and induction of cool secondary air into the cylinder provides cooling. Each

SEC Transactions

Purchase of 10,000 common shares of Fairchild Engine and Airplane stock by Grover Loening, director, making a total holding of 20,000 shares, is reported in Security and Exchange Commission's latest survey of major transactions.

- Purchase of 200 common shares in Fairchild by George F. Chapline, officer, is also reported.

- Other transactions by aviation officials reported for the mid-September to mid-October period included:

- **Airfleets, Inc.** Purchase of 1400 common shares by Oswald L. Johnston, director, making a total holding of 2600 shares; purchase of 10 common shares by C. C. Sawyer, officer, making a total holding of 15 shares.

- **Consolidated Vultee Aircraft Co.** Sales of 2000 common shares, total holding, by George H. Howard, director.

- **Eastern Air Lines, Inc.** Purchase of 4200 common shares, by L. S. Rockefeller, director, making a total holding of 74,200 shares.

- **Lockheed Aircraft Corp.** Sale of 300 capital shares, by Cyril Chappellet, director, leaving a holding of 4154 shares.

- **National Airlines, Inc.** Purchase of 200 common shares, by Joseph Merrick Jones, director, making a total holding of 6900 shares.

- **Northwest Airlines, Inc.** Purchase of 200 preferred shares total holding by Amos Culbert, officer.

- **Pan American World Airways, Inc.** Sales of 100 capital shares by Robert G. Ferguson, officer, leaving a holding of 471 shares.

- **Solar Aircraft Co.** Purchase of 100 common shares by E. Franklin Hatch, director, making a total holding of 200 shares.



CITED FOR SAFETY

Winners of the annual awards of the Flight Safety Foundation (AVIATION WEEK Oct. 30): seated (left to right), Brig. Gen. Carl B. McDaniel, commander, Randolph AFB, Tex., who was commander of Mather AFB, Sacramento, Calif., when that base compiled a record of 41 months training operations and 30,585,800 air miles without a fatality or injury; Brig. Gen. C. H. Caldwell, commander, Lowry AFB, Denver, Colo., who represented Maj. Gen. Robert W. Harper, commander of the Air Training Command; J. A. Herlihy, vice president-

operations, United Air Lines, who made the presentations; Capt. Ian R. Harvey, British European Airways. Standing (left to right), Lt. Col. David Kellogg, commanding officer, Maintenance and Supply group, Mather AFB; Capt. Robert K. Baker, American Airlines; William L. Anderson, Pennsylvania Aeronautics Commission; Carl F. Barker, Hamilton Standard Division of United Aircraft Corp.; and R. T. Ledbetter, Curtiss-Wright Corp. Awards were presented in conjunction with FSF safety seminar in Denver.

Washington Roundup

Navy Build-up

In private conferences during the congressional recess, Chairman Carl Vinson of the House Armed Services Committee has asked Chief of Naval Operations, Adm. Forrest Sherman, and Deputy Chief of Naval Operations for Air, Vice Adm. J. H. Cassady, to blueprint a plan to build up the striking force of the Naval air arm.

It would mean procurement of about 600 additional new aircraft.

The plan still must be approved by the Joint Chiefs of Staff, the Secretary of Defense, the National Security Resources Board, the Budget Bureau, and the White House before it will be publicly disclosed. But whether it's approved by the Administration or not, Vinson will push it in the new Congress at the turn of the year. The odds, by past performance, are that he will put it across—despite any political opposition.

Pearl Harbor Navy?

Vinson's determination to push the Navy build-up came after Adm. Sherman's report that the Navy's regular air arm by next June will be only slightly stronger than its Pearl Harbor air fleet. On June 30, 1951, the Navy, under its present program will have 5491 operating aircraft—a slight margin of some 250 planes more than the 5243 at its disposal on Dec. 7, 1941.

"It shocks everyone but us," commented Bureau of Aeronautics chief, Rear Adm. A. M. Pride. "We've grown used to living with a deteriorating naval air arm."

Modest Expansion

Air force, with Administration approval, is building up to the 70-group program—now called "the 69-group program"—recommended by the Finletter Air Policy Commission and the Congressional Air Policy Board.

The new proposed program for the Naval Air Arm will fall far short of the recommendation of the Congressional Air Policy Board for a Naval striking force of 14,500 aircraft. It would increase the Navy's large attack carrier force from the nine now programmed to 12, and build up the number of operating aircraft from 5491 to 7500. This is how it would bolster the Navy's air striking force:

- **Carrier Air Groups:** 12 now programmed; this would be increased to 16.
- **Marine Air Squadrons:** 18 now programmed; this would be increased to 24.
- **Patrol Squadrons:** 27 now programmed; this would be increased to 34.
- **Anti-Sub Squadrons:** 10 now programmed; this would remain the same.

Foreign Mail Pay

Senate Interstate and Foreign Commerce Committee is working on an "approach" to separating air mail service pay from subsidy over international routes.

The Committee's chairman, Sen. Edwin Johnson, has not endorsed the proposal to set the International Postal Union rate of \$2.86 per ton mile as the service rate. Under this, for one year—ending Sept. 30, 1949—studied by the committee, American Airlines would have been underpaid \$76,000; Pan American Airways, \$132,000; and Trans World Airlines, \$303,000.

The Carrier—Always?

Even if the missile is perfected for cruiser use, he continued, "it will find its mass application with carrier-based planes. They will be able to strike at the enemy with guided missiles from a more distant base than the cruiser ever will. The aircraft carrier is going to remain the heart of the Navy for the foreseeable future."

"Super" Carrier

Navy is trying to wash away the "super" and "sitting duck" designations tagged onto its proposed carrier, the United States, whose construction was cancelled. The new flush-deck carrier the Navy is pushing, though, would be about the equivalent of the United States.

But it has already gained substantial support because of Sherman's emphasis on its maneuverability—as great as any carrier now on the seas, and its potency for tactical operations. Navy now disclaims that it has any intention of using the new flush-deck for strategic bombing.

It highlights that it will be able to use the new carrier for tactical air support by high-powered jets from some 600 miles distance from an enemy target, compared to the some 300-mile range for present carrier-based planes.

Jet Limitations

Unless the Navy's new flush-deck ship is approved, manufacturers will have to hold back on their weight and speed-performance characteristics for new naval aircraft, according to Adm. Cassady. "Our present type carriers cannot catapult and service the navy fast jet aircraft now on the drawing boards of manufacturers. Unless the new carrier is authorized, we'll have to lay down limitations to manufacturers on the types of aircraft we can procure."

More Procurement Money

Air Force has requested several hundred million dollars more for procurement this year to off-set price rises. The request is before the Secretary of Defense. The increase won't mean any build-up, simply make possible the present 69-group program. Navy's BuAer hasn't asked for an increase in procurement funds to off-set price rises yet. "But, it looks as though we will have to," BuAer's chief Adm. Pride commented.

Excessive Rail Rates

Railroads have succeeded in getting Interstate Commerce Commission to recommend legislation which would invalidate Justice Department's suit to recapture excessive rail charges on aircraft and parts shipments.

At ICC's request, the chairmen of the House and Senate Interstate and Foreign Commerce Committees introduced the measure.

It would also sanction excessive rail rates on aircraft and parts in the future.

Aircraft Industries Assn. estimates that manufacturers are now "over-paying" upwards of \$15 million a year in freight rates—being passed on to Air Force, BuAer and the airlines in plane costs.

"This legislation is so malicious," AIA's traffic expert Harry Brashear commented, "that I think we will be able to lick it single-handed—even if no one comes in to help us."

PRODUCTION

AF and Industry Study Production

Los Angeles meeting this week will review the joint program designed to improve manufacturing methods.

By William Kroger

Dayton—The aircraft industry this week will get together with the Resources Planning Section of Industrial Planning Division on material and manpower savings that can be achieved by using manufacturing methods now in the experimental stage.

These methods, being developed under sponsorship of the Manufacturing Methods Branch of the Industrial Planning Division of the Air Materiel Command, promise more efficient use of the economic factors of production, especially in the event of mobilization.

At a Nov. 17 meeting in Los Angeles of the Aircraft Industries Assn.'s Technical Service group, the Manufacturing Methods officials will report to representatives of West Coast manufacturers what has been done on 18 projects suggested by AIA as well as review MMB's overall program.

► **Good Results**—The Manufacturing Methods Branch now is in its third year, with some good results evident. It started in fiscal 1947 with two projects, one to use lesser strategic materials in jet engines and in investigation of a coordinate setting machine for tooling.

Now MMB has about 100 projects, investigating manufacturing methods of the many different production operations used fabricating the complete airplane.

The MMB maintains close coordination with Procurement, Engineering, and Research Divisions of AMC and the indications are that the MMB's program is paying off. Once industry might have thought MMB's work was an opening wedge for the Air Force to go into the manufacturing business. As evidenced by AIA's asking MMB to investigate numerous problems, the manufacturers are behind the program.

Instances like this have demonstrated the cooperation between the Air Force and industry:

- **A Potential Saving** of 1100 lb. of steel in the manufacture of a propeller blade by extrusion instead of machinery and welding.
- **A Potential Saving** of \$12 in material and manpower on a subminiature electronic tube which now costs \$30; under full-scale mobilization, this could amount to a total of \$288 million.
- **A Saving** of 20 percent in time in lining up certain airframe jigs by using an optical positioning method.

• **Clearing House**—The Manufacturing Methods Branch in effect is a clearing house for tooling information available in the industry.

The Industrial Planning Division has found in some instances that Manufacturer A might be calling for tools to do a job that could be done by Manufacturer B, who might have different tools. In some instances assists have been obtained outside the immediate aviation industry. So the Manufacturing Methods Branch studies such a situation to determine possibilities of new tooling concepts that may be best for the job in future planning.

This concept had also been utilized in the past, which previously led to the establishment of the Air Force pilot manufacturing plant at Adrian, Mich. (AVIATION WEEK Nov. 8, 1948), the shining example of what the Air Force is trying to do. It is here that a promising method of manufacturing propellers is under development.

MMB engineers studied the manufacturing operations in cooperation with the Curtiss Propeller division of Curtiss-Wright Corp. where, with the best methods known and highly skilled workmen, it was necessary to start with a 1500-lb. piece of steel to produce a 200-lb., 10-ft. blade. MMB technicians assisted in the design of dies, and, working with the Curtiss people, succeeded in squeezing a 400-lb. molybdenum steel billet through a 5500-ton press and produced a 200-lb., 10-ft. blade.

The result:

- **Potential saving** of 1100 lb. of critical material.
- **Elimination** of possibly 75 percent machining.



AVRO CANADA FILLING INCREASED ORDER FOR CF-100

Order for an undisclosed number of CE-100 Canuck twin-jet fighters has been given by the Canadian government to A. V. Roe

Canada Ltd. as part of new defense expenditures. The first order was for ten of the aircraft, but subsequent orders have increased

that figure considerably. Photo shows a section of the A. V. Roe plant at Malton, near Toronto, in CE-100 production.

- **Time-saving** in elimination of about 175 in. of welding.

- **An extrusion time** of about 15 seconds, as opposed to the hours it takes to produce a blade by conventional means. This means a reduction in lead time vital to accelerating productive capacity.

About 40 extruded blades have been produced to date experimentally and Curtiss now has a contract to produce 100 prop blades by this extrusion method.

The Resources Planning Section is aiming at reduction of both manpower and materials in manufacturing. So it deals with development of both products and processes. It does none of the actual work itself. All is done by industry under contracts let through the Procurement Division of AMC.

The entire program is still too new for detailed cost analyses. Cost reductions will flow naturally from decreased manpower and material requirements.

► **Reduced Manpower Needs**—Perhaps the most important attainment will be reduced manpower requirements; or, to be exact, reduced requirements for highly skilled manpower. Maj. Adams points out the terrific complexity in production of electronics systems which require, even for minor production, personnel with training far above normal standards. And in case of full-scale mobilization there just wouldn't be enough of such people. Projects are under way to serialize some phases of electronics production.

About the same reasoning applies to materials.

That the methods being developed under MMB sponsorship will save mobilization costs for the Air Force is plain. What this means to the manufacturer is not so clear at the moment. If a manufacturer has an incentive-type contract whereby he retains part of any saving on the target price, he may stand to reap greater profits. But the factors of excess profits tax and renegotiation have to be considered.

MMB does not interfere with a manufacturer on costs and profits and proprietary rights. The normal research and development contract of the Air Force contains a provision that any patents arising from work on the contract become the property of the government and can be made available to all industry.

MMB has had no occasion to deal with the proprietary rights angle. For the entire manufacturing methods program is voluntary. The Military Establishment probably could enforce compliance with recommendations on processing but is neither willing nor ready to do that since it is recognized the competitive enterprise will seek the proper level if properly encouraged.

► **Projects**—The effectiveness of the voluntary approach is attested to by the close cooperation with AIA. About two years ago, the manufacturers, through AIA, submitted to MMB a list of nearly 120 projects it would like to have investigated. After discussion, the list was winnowed down to 18 for actual processing. They are:

- **Precision castings** of large airframe parts, suggested by Bell.
- **Non-destructive weld tests**, offered by Bendix.
- **Electronically-controlled routing and drilling**, suggested by Boeing.
- **Machine to cut templates** from photos, suggested by Boeing.
- **Stretch measuring device**, suggested by Boeing.
- **Hydro-forming**, suggested by Douglas.
- **Stretch leveling**, suggested by Douglas.
- **Simultaneous tapering and contour forming** for sheet stock, suggested by Fairchild.
- **Long distance measuring device**, also offered by Fairchild.
- **Welding of heavy aluminum**, suggested by Lockheed.
- **Prevention of distortion** when machining, also offered by Lockheed.
- **Electronic assembly production checker**, suggested by Martin.
- **Countersunk head screws and rivets**, suggested by McDonnell.
- **Die quenching**, suggested by North American.
- **Constant tolerance die mold material**, suggested by Northrop.
- **Pre-welding treatment**, also by Northrop.
- **Stretch-forming of tapered sheets**, suggested by Republic.
- **Stainless steel tapered sheet**, offered by Ryan.

Lockland Expands

General Electric's jet engine manufacturing facilities at Lockland, O., are in for a big expansion. The company is planning to procure additional undisclosed space there and is moving executive and engineering staffs from Lynn to Ohio. Although management states that present operations at Lynn and nearby Everett, Mass., will not be changed by the transfer, the decision indicates that Lockland is slated to become the focal point of GE's future jet operations.

Additional space to be obtained at Lockland has not yet been fully decided. The former Wright Aeronautical-operated plant is now owned and partly occupied by the Electric Auto-Lite Co., and is shared by GE, Auto-Lite and Seagram Distillers. GE has been producing engines there since February, 1949, utilizing nearly 200 subcontractors.

AF Invitations

Bids openings are 20-30 days after approximate issue dates shown in the following bid proposals. Bid sets containing specifications for items to be procured will be sent to qualified applicants who state bid invitation number.

One bid set will be available for examination without obligation by prospective bidders, after bid publication date, at each of the seven AMC procurement field offices. This will enable firms to see specifications before writing or telegraphing for their own bid sets.

Procurement field office locations: Boston Army Base, Boston 10, Mass.; Government Aircraft Plant No. 4, Ft. Worth 1, Tex.; 39 S. La Salle St., Chicago 3; Wright-Patterson AFB, Dayton, Ohio; West Warren and Longo Aves., Detroit 32; 155 W. Washington Blvd., Los Angeles; 67 Broad St., N. Y. 4.

Adapter, 400 each, bid invitation No. 51-947, issue date 2 Nov., delivery within 90 days after date of award.

Resistor, precision, 2-20 items, bid invitation No. 51-948, issue date 2 Nov., delivery within 270 days after date of award.

Test set, 707 each, bid invitation No. 51-952, issue date 2 Nov., delivery complete within 60 days after government approval of first article.

Stand assembly, 78 each, bid invitation No. 51-953, issue date 2 Nov., delivery complete within 100 days, after government approval of first article.

Filter unit lens, 1-4 items, bid invitation No. 51-957, issue date 2 Nov., delivery complete within 90 days after date of award.

Communications equipment C1-16, 1-7 items, bid invitation No. 51-941, issue date 2 Nov., delivery of 50 units a week, within 90 days.

Resistor and capacitor, 1-17 items, bid invitation No. 51-949, issue date 2 Nov., delivery within 270 days after date of award.

Control panel, 1-12 items, bid invitation No. 51-951, issue date 2 Nov., delivery of first articles within 60 days, production to start within 60 days after approval of first articles.

Coupling assembly, 1-9 items, bid invitation No. 51-955, issue date 2 Nov., delivery complete within 90 days after date of award.

Hose assembly, and adapter, 16,000 each, bid invitation No. 51-956, issue date 2 Nov., delivery 30 to 120 days after date of award.

Nut assembly, 1-36 items, bid invitation No. 51-959, issue date 2 Nov., delivery ¼ within 60 days, ¼ within 90 days, ¼ within 120 days.

Commercial electrical equipment, C1-08, 1-18 items, bid invitation No. 51-960, issue date 2 Nov., delivery complete within 90 days.

Chemicals, C1-24, 1-32 items, bid invitation No. 51-962, issue date 2 Nov., delivery by 26 Dec. 1950.

Aircraft & engine accessories, C1-03, 1-15 items, bid invitation No. 51-963, issue date 2 Nov., delivery complete within 90 days.

Special tools & equipment, C1-18, 1-43 items, bid invitation No. 51-964, issue date 3 Nov., delivery to begin in 60 days, complete 30 days thereafter.

Connector-plug, 1-12 items, bid invitation No. 51-965, issue date 3 Nov., delivery within 30 days after date of award.

Aircraft hardware, C1-04, 1-11 items, bid invitation No. 51-966, issue date 3 Nov., delivery to start in 45 days, complete in 120 days.

Aircraft hardware, C1-04, 1-8 items, bid invitation No. 51-967, issue date 3 Nov., delivery to start in 45 days, complete 120 days.

Connector-receptacle, 1-12 items, bid invitation No. 51-968, issue date 3 Nov., delivery within 30 days after date of award.



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LETTERS

A Ph.D. View

Among the Letters to the Editor Aug. 21 was one from Mr. Baughman of Viking Air Lines. He wants this question answered: "What about the pioneers—the nonskeds that paved the way for the public to enjoy air coach? Must they be throttled—put out of existence? Where is our free enterprise?"

It appears that not only must the answer be repeated but also a protest entered against Mr. Baughman's way of stating the question. To "throttle . . . pioneers" seems both ungrateful and damaging to the future of this country. And the question, "Where is our free enterprise?" certainly is intended to suggest that our American system and the freedoms we hold dear have been crudely assaulted. The cease and desist order against Viking, or for that matter against any other nonskeds, means no such thing, of course.

Air transportation is legally a public utility in the United States. Since a public utility is a business "peculiarly affected with the public interest" it is subject to a set of "rules of the game" found nowhere else in our economy. The Civil Aeronautics Act of 1938 gave the CAB typical public utility regulatory powers, that is, the authority to create a monopolistic situation by limiting the number of airline companies, and then to control these presumably privileged firms in the interest of the public. It amounts to giving a privilege and simultaneously making the recipient impotent to use the privilege to his own advantage. But why such a roundabout method? It is used because of the assumption that unlimited competition would be unworkable in the industries labeled public utilities.

If the nonsked argues that unrestrained competition—over all routes for all kinds of service—is workable in air transportation, then he goes to the heart of the matter. He questions the public utility treatment of this industry and would scrap most of the economic regulation provided in the 1938 Act and in our motor carrier regulation, too. He may be right, although I believe the case has not been proved as yet, and I see no evidence that such a drastic overhaul of our transportation regulation is imminent.

If, on the other hand, the nonsked argues that this is a country of free enterprise and implies that the CAB has no moral right to put him out of business he attempts to substitute the rules of, say, the grocery store "game," for the rules of the public utility "game," without having demonstrated that the air transport business is economically more like a grocery store operation than it is like an electric or gas company. He forgets that the public utility operator plays the game according to a rigorous set of rules he never made. The nonsked has lived on borrowed time since birth, and probably knew it. It can be argued that the CAB was remiss in letting him slip into business in the beginning.

But, the nonsked replies, what about my pioneering work in developing air coach service? He points with pride, as Mr.

Baughman does, to the eminent editorials in AVIATION WEEK on the subject. It seems to me that those editorials said, in a forthright manner, what needed to be said on the nature of the demand for air service. However, I do not get from them the view that unrestrained competition should be tried in air transportation today.

Again, perhaps the CAB was remiss in not positively encouraging, or, if necessary, forcing the scheduled airlines into air coach experiments. At least, I see little value now in attaching praise or blame to any of the three participants in the controversy. The nonsked got into the industry where he could. He was an innovator, but that is faint praise since it is easy to be bold with other people's money—in this case the government investment in war-surplus equipment. The scheduled airlines stayed where they were, since there is little incentive to be bold under our mail pay system. There is no point in wishing that the five capable men in Washington had the omniscience of gods.

The answer is logical, if you start with the public utility status of air transportation. The CAB order is sound if you accept the view of public utility regulation that the well-being of the certificated operation is the only thing that matters to the public interest. Unfortunately, no answer is satisfying to a nonsked forced out of business.

DOLE A. ANDERSON, Ph.D.
Department of Public Utilities
& Transportation
New York University
New York, N. Y.

Copter Coverage

Your Oct. 9 issue, which on page 12 features the helicopter industry, certainly has pepped up everybody around here and it should do the same throughout the rest of the helicopter industry. . . .

Will you please rush us 25 additional copies.

C. M. BELINN, President
Los Angeles Airways, Inc.
Box 10155
Airport Station
Los Angeles 45, Calif.

Policing Nonskeds

Many thanks for your article concerning ACTA in your Oct. 2 issue. We intend to fulfill the mandates of the organization in order that the general public will be completely satisfied with the low-cost transportation which we pioneered.

Today, I suspended Columbia Air Coach System Agency from the Air Coach Transport Assn. This action was not taken in haste. After several meetings and a hearing of Columbia Air Coach Systems before the Executive Board in which we attempted to help them straighten themselves out, I found that they continued to be a detriment to the industry in their misrepresentation to the public, their complete disregard

for credit and ethical business practices. Therefore, the above action takes effect immediately.

I would like to mention that there are several other agencies whom we are investigating at the present time and if they do not straighten out, a similar action will be taken against them. We are a two-fisted organization and will continue to be tough where it is necessary.

We appreciate any brickbats or bouquets which you have and welcome your suggestions.

Thanking you again for your assistance in our job. . . .

JOHN MARK, Coordinator
Air Coach Transport Assn.
55 W. 42 St.
Suite 1143
New York, N. Y.

J-42 in Combat

I would like to toss a bouquet to Alpheus Jessup for his series of excellent articles on the reports of air power in the Korean war. He has made available a great deal of interesting material that is not supplied by the daily press or any other source that I know of.

However, I would like to correct one statement he made in his most recent report on Naval air power in action. Jessup wrote that "only the F9F-3 has been in action in Korea." The Navy records show that a squadron of Grumman F9F-2s powered by the P&WA J-42 Turbo-Wasp went into action over Korea on Aug. 6 from the deck of the carrier Philippine Sea. They have been in continuous action ever since and among other things provided air coverage for the successful invasion at Inchon.

Incidentally, the J-42 has compiled a rather startling record for reliability and durability during its first year of active service by doubling its overhaul interval from 150 to 300 hours. It is in service with both Navy and Marine squadrons.

I, and probably a great many others in the industry, would like to see Jessup tackle the role of the helicopter in Korea in the same fashion he has written of jet fighters, airlift and Naval aviation. I have a feeling there is a great deal of material there which has not yet been published.

ROBERT B. HOTZ, Public Relations
Manager
Pratt & Whitney Aircraft
Div. of United Aircraft Corp.
East Hartford 8, Conn.

Seaboard's Case

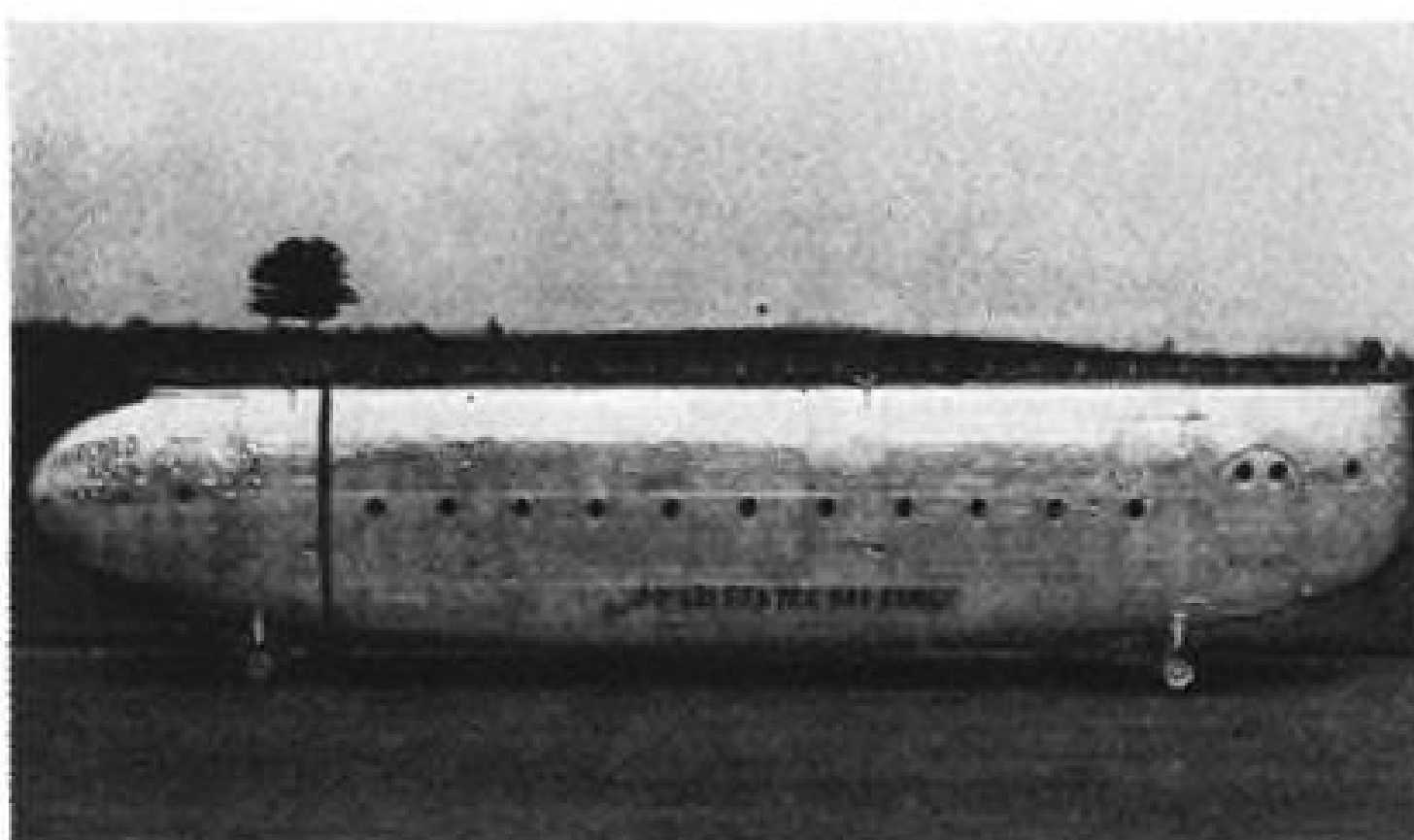
I read with interest your editorial Oct. 9 ("Business As Usual"). I am enclosing a copy of a brief on the United States-Europe-Middle East Cargo Service Case. I believe you will be interested in the exceptions we have made. I hope that Seaboard and Western will get a break and be certificated as an all-cargo carrier without subsidization requirements.

C. H. SCHILDHAUER, Aviation Director
Baltimore Association of Commerce
22 Light Street
Baltimore 2, Md.

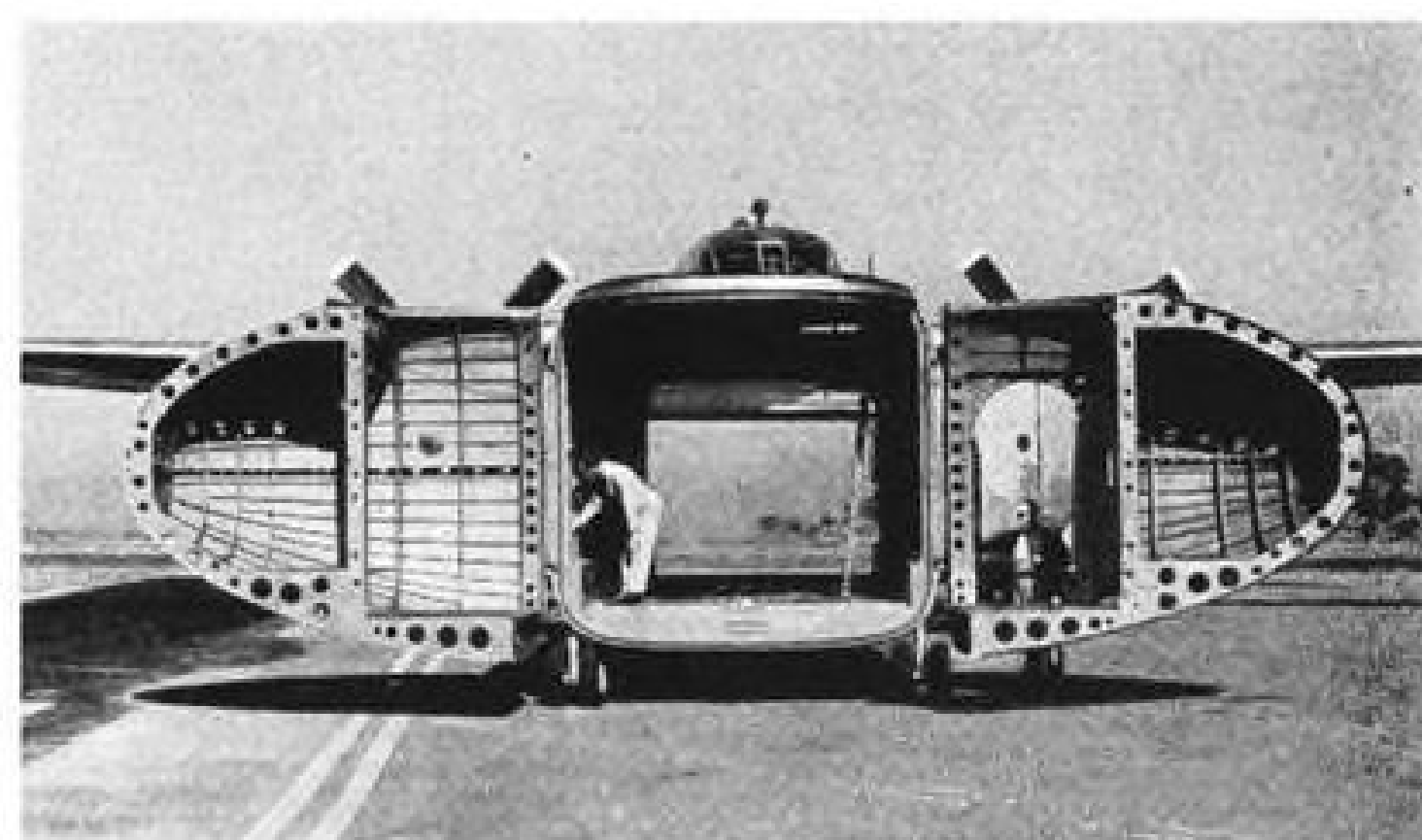
AERONAUTICAL ENGINEERING



PACK PLANE is Fairchild's high-utility design combining huge detachable fuselage with quick-turn-around carrier. Gap between the two is closed by inflated deicer-boot-type seal. Craft is logical progression of C-82 and C-119B.



LONG pack measures almost 56 ft. overall, about 37 ft. between hinged clamshells. Wheels detach easily.



SPACIOUS cargo hold has clear, 2700-cu. ft. of volume. Clamshells give easy fore-and-aft loading.

How XC-120 Pack Plane Is Engineered

Simple hookup plan for carrier and detachable pack extends usefulness of "flying boxcar" concept.

By Irving Stone

The detachable-fuselage XC-120 Pack Plane opens a vast potential of utility in the field of air transportation, both military and commercial.

Though this specific quick-turn-around cargo concept represents a radical departure from conventional methods of air haulage, the roots of the design go back to proven configurations for high utility.

► **How Idea Evolved**—Original design ancestor of the Fairchild Engine & Airplane Corp.'s XC-120 is the company's C-82 Packet, which introduced a new high in the utility scale. This "flying boxcar"—actually an aircraft

built around a huge cargo space—gave a substantially rectangular, unobstructed, end-loading, 2312-cu. ft. room to accommodate trucks, tanks, half-tracks and other bulky units without necessity for dismantling.

Next step in the progression to the XC-120 was the C-119 Packet, also embodying the C-82 boxcar configuration, but a larger, heavier craft affording more cargo volume (2700 cu. ft.) and greater speed.

Because the boxcar principle of these planes was so eminently fitted for resolution into a carrier and detachable fuselage (pack) arrangement, the C-119B evolved into the XC-120 with a minimum of design changes. This

Pack Plane is another classical example of how one good basic design can be adapted and improved for still higher utility.

► **Costs Cut**—Design concept of the XC-120, as well as the C-119B and C-82, originated with Armand J. Thieblot, Fairchild Aircraft division's chief engineer.

Work on the XC-120 design was begun in Fairchild's Washington, D. C., office on Jan. 1, 1948, under supervision of project engineer James A. Sterhardt, who heads the development program.

As many parts as possible were carried over from the C-119B to cut design costs, utilize same tooling, and promote interchangeability. Approximately 3100 new detail drawings were added to about 3200 of the C-119B. The latter in turn, incorporated many

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Illustrated above is the Window Converter Unit—the "heart" of the new Model V22E. It is extremely compact, and weighs much less than other electric wiper installations.

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of the C-82 drawings, and thus the savings stem progressively from the initial boxcar design.

In relation to the C-119B, the XC-120's outer wing is the same, the center wing modified but locally.

Lower fin and rudder units were added to the twin booms (as on the C-82). A dorsal fin is installed on the booms for added stability.

Stabilizer, elevator, and upper fin and rudder are unchanged.

Bottom half of the pack is the same, while upper portion is slightly modified. Cargo volume remains identical, and tiedown fittings are unchanged.

► **Trial Vehicle**—The Pack Plane is not advanced as the final answer in the carrier-detachable fuselage scheme. It is merely a preliminary step to probe the possibilities of the hookup plan and supply answers to the numerous design and operational problems that must be ironed out before production is deemed feasible.

Much development work remains and no conclusions can be drawn now as to whether the plane will be used in this specific configuration for military or commercial service, even though the craft has demonstrated its fundamental usefulness in more than a dozen flight trials and numerous hookup demonstrations since it first took to the air on Aug. 11, 1950.

► **High Utility**—Even at this stage of development, the Pack Plane scheme indicates a degree of adaptability that appears limited only by the imagination. Here are some of the advantages foreseen:

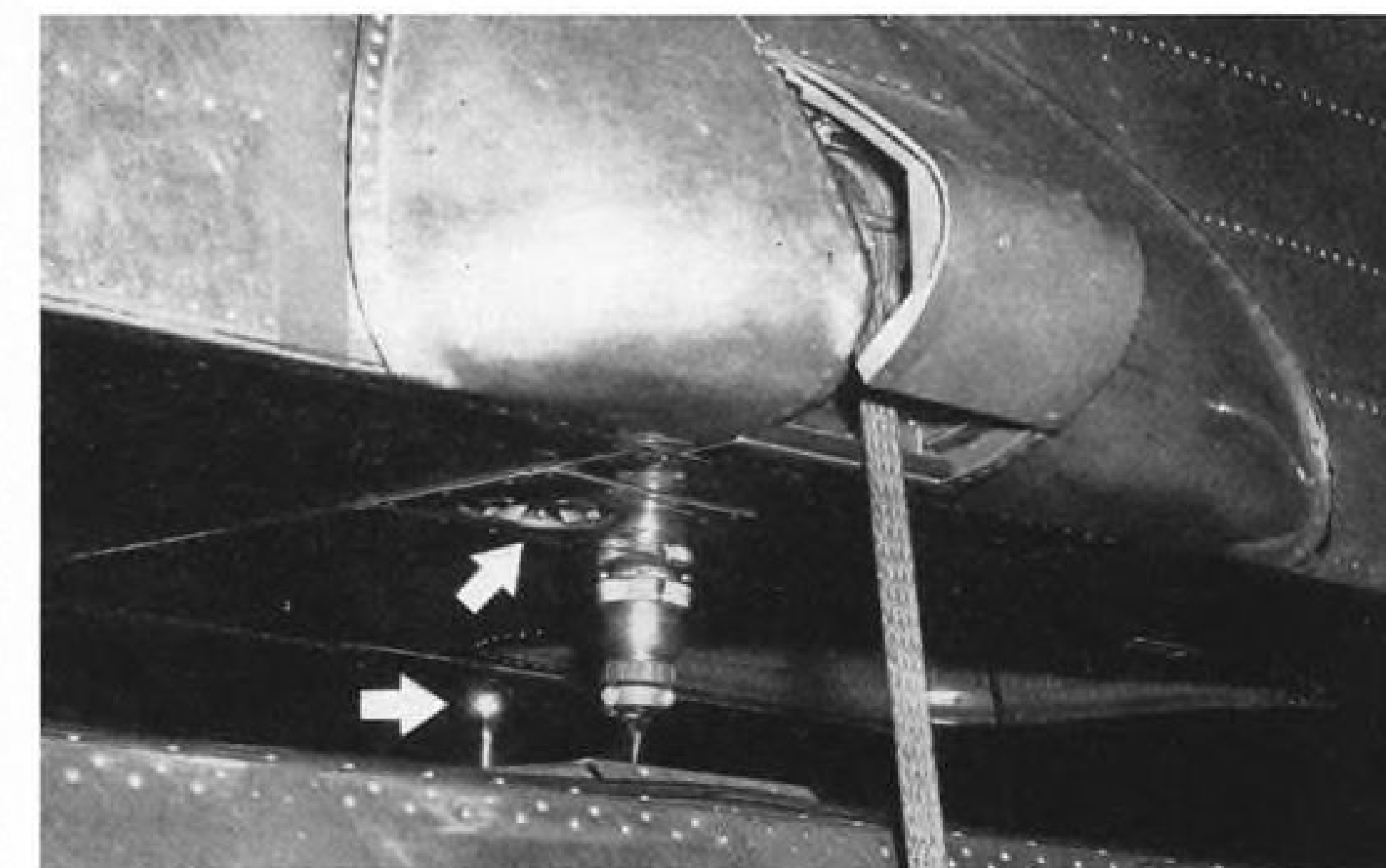
- It will increase the airplane (carrier) utility by almost double. It eliminates tying up the craft for a considerable period during loading or unloading, relieves airport congestion.
- Packs are cheaper than planes. Thus,



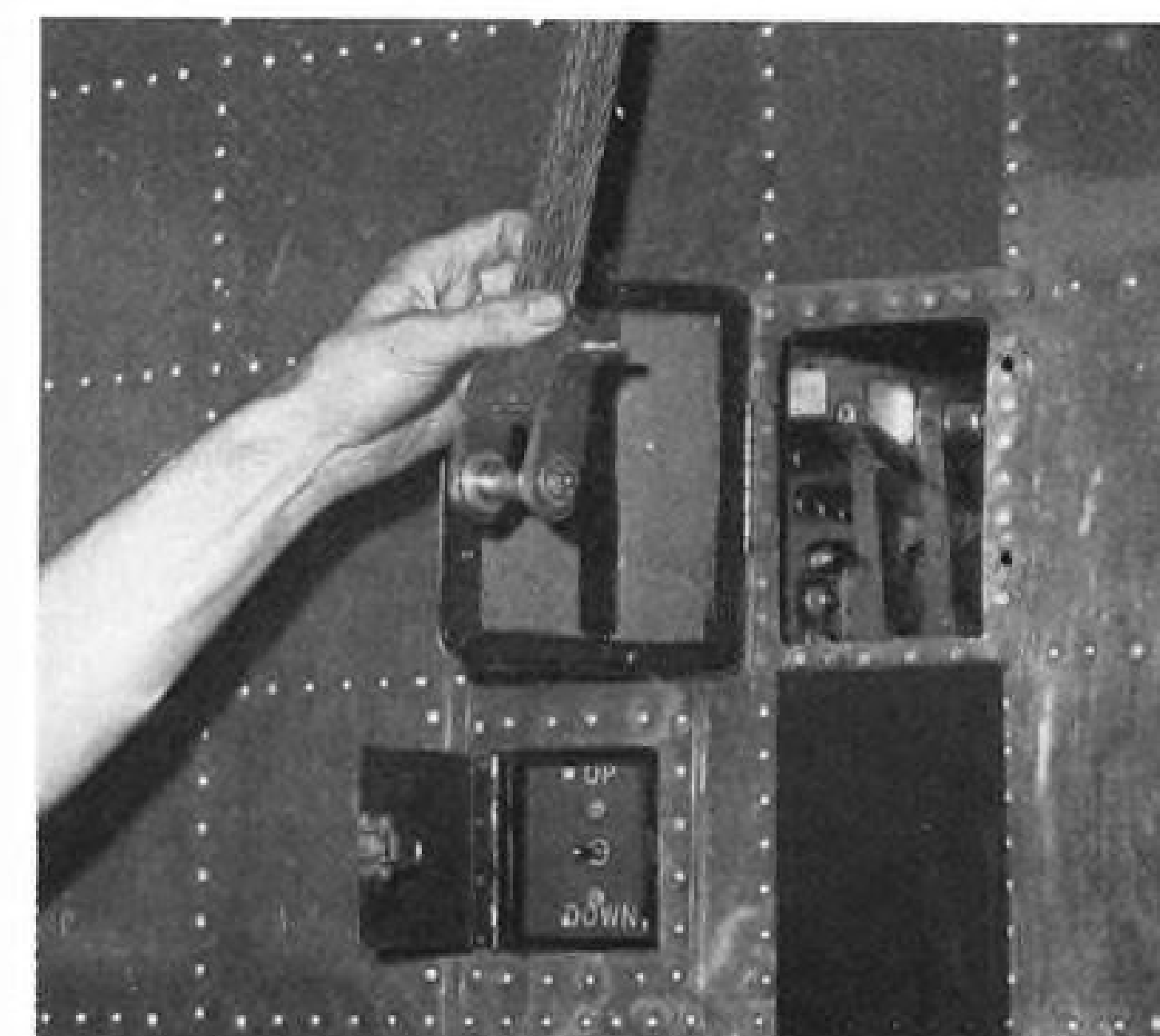
EXTENSIBLE ladder reaches to crew hatch.



LADDER FOLDS to compact 3-ft. unit



HOOKUP between carrier and pack is by orange-peel and ball fittings (arrows). Also seen are electrical hookup, hoist cable, crew nacelle hatch.



PACK HOOK extended for attachment to flat hoist cable. Switch controls cable travel.



CLOSURE is controlled by main-switch operator standing in pack as he watches nacelle-pack alignment.

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LANDING GEAR is quadricycle type, with 15-ft. 7-in. wheelbase. Main and auxiliary units are retracted aft simultaneously.

one plane could be combined economically with different pack types variously affording accommodations for refrigeration, heating, machine shop, photo lab, hospital, headquarters, storage, radar station, paratroopers, etc.

• Special insulated packs could be used for arctic operations to afford temporary, advanced housing.

• Packs could be loaded directly at an equipment manufacturer's warehouse, to reduce handling and transit time, cut breakage chances. In this connection, packs could be designed for roadability to permit highway towing by trailer-truck. This, of course, would involve decreasing the pack from its present approximate 11-ft. width to about 8½ ft.

• Non-strategic materials could be used for pack construction.

• Packs could be designed for dropping by chute or skidding them to a landing on land or from a water touchdown onto a beach.

• In commercial application, planeloads of materials could be shipped from manufacturer to wholesaler or retailer in a single handling operation, the pack to be trucked to the airport for pickup at plane arrival, eliminating usual intermediate handling and storage problems.

• And packs could be fitted for specific shipping schemes required by the various industries.

► **Pack Scheme**—Pack on the XC-120 has two large clamshell doors on front and rear to allow cargo passage at either end. Paratrooper doors are cut in the rear clamshells as on the C-119.

Top of the pack is flat to match with the flat contour of the carrier. For positioning under the carrier, the pack may be towed or pushed by tractor bar attachment to either of the front beaching-type support wheels. The two front wheels are rotatable and casting. Rear wheels are fixed.

Off-center positioning of the pack under the carrier is no problem because the cable hoists in the latter have

swiveling sheaves to take care of misalignment.

► **Hookup**—There are four lockpoints—orange-peel-jaw type—on the underside of the carrier's crew nacelle.

One jaw of the front pair is located just aft of pilot's seat, the other eight feet directly opposite, aft of copilot's seat. Rear jaws on the crew nacelle are similarly oppositely located, about twelve feet aft of the front fittings, under the rear spar of the wing carry-through structure.

All four lock fittings in the crew nacelle are interconnected by a continuous chain and cable system to permit arming, locking and release by a manual control lever on the flight deck. This control also permits jettisoning the pack in flight.

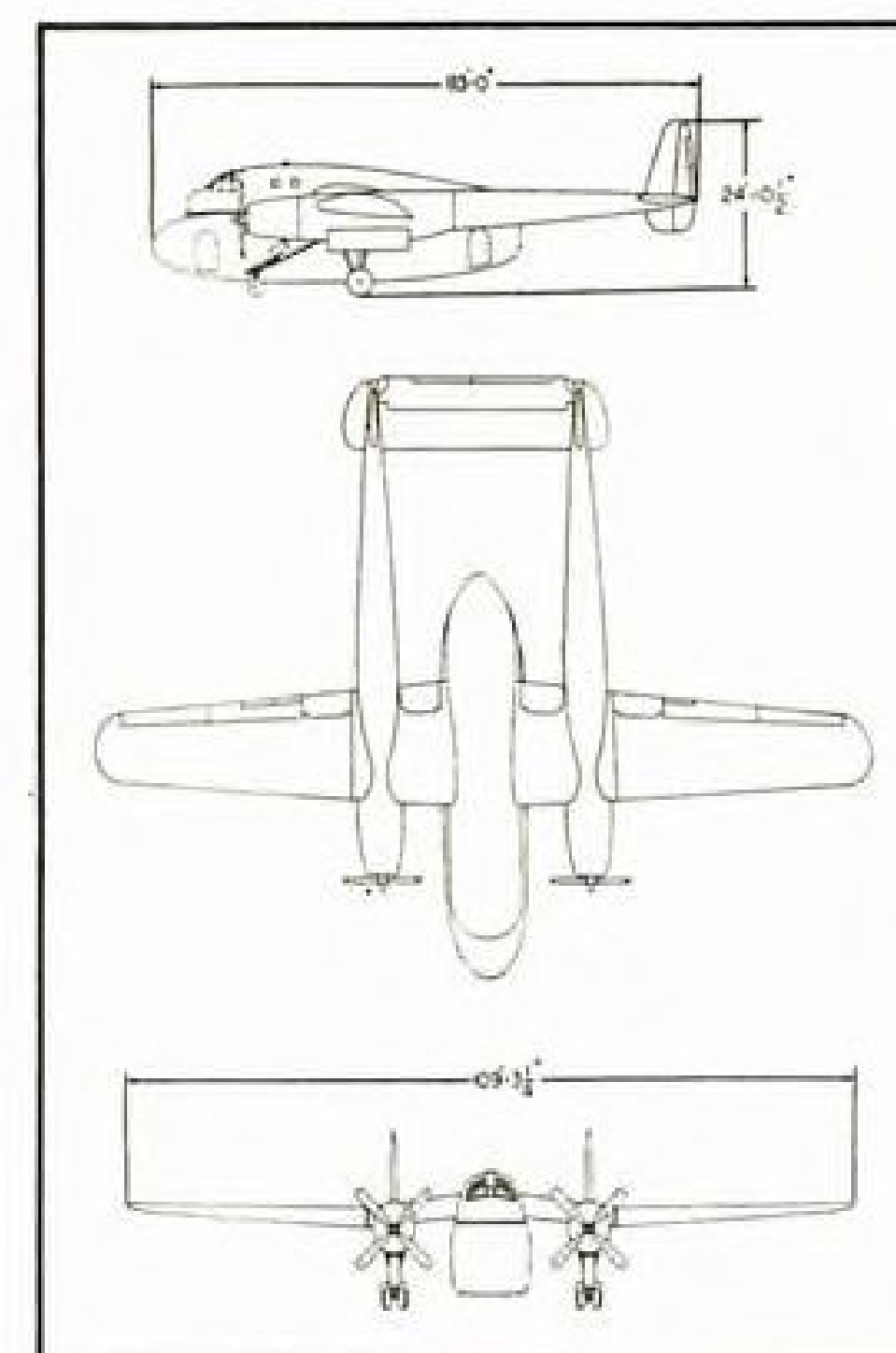
On the roof of the pack there are four ball type fittings (front, 1¼ in. diameter; rear, 2½ in. diameter) which mate with the orange-peel units on the crew nacelle.

All fittings are stainless steel, to resist corrosion. Front units will take about 25,000 lb. vertical loads; rear right fitting, about 50,000 lb. vertical load and 25,000 lb. side and fore-and-aft loads; rear left fitting taking vertical and side loads only. The rear fittings are stronger because C.G. of the pack is nearer the rear.

► **Flat Cables**—At each orange-peel fitting in the crew nacelle is a constant-speed motor and hoist arrangement to raise and lower the pack.

Hoist cables presented a difficulty. Round cable could not be used because drum size would be too large. A flat configuration of 7 × 7 aircraft steel wire, specially made by American Chain & Cable Co., solved the problem. Front cables are 1½ in. wide by ⅝ in. thick, rear are 2 × ⅝ in.

Cable pulleys on the front of the crew nacelle extend beyond the skin and are covered by fairing. Cables on rear pulleys come through the crew



THREE VIEW of Pack Plane.

nacelle just aft of the wing rear spar. ► **Pack Hooks**—The four hoist hooks on the side of the pack are hinged and housed behind small flush-skin doors about five feet above the ground.

Alongside each pack hook is a switch to permit raising or lowering of cable.

When the pack is positioned for hoisting under the carrier, an electrical connector extending from the roof of the pack is plugged into a receptacle on the carrier. This gives electrical current to the pack for the cable switch, lighting, signals, and intercom functions from a source of external power or from an auxiliary power unit in the carrier. The A.P.U. will supply sufficient power to raise a pack cargo load of 5000 lb.

► **Initial Regulation**—Each cable-hoisting switch on the pack is thrown to the "down" position and cables are lowered from the pulleys on the carrier. Where the cables pass over the surface of the pack, there are plastic rubbing plates to prevent abrasion.

Cable speed—up or down—is 2 fpm., purposely made this slow to explore the hoisting procedure in this experimental model.

When the cables have been dropped sufficiently to engage the pack hooks, connection is made and slack is taken up by holding the adjacent switch in the "up" position, the power being cut off automatically when 500 lb. of tension is placed on the cable.

Separation distance between pack and carrier, when hoisting begins, varies from about 9 to 18 in., depending on fuel load in carrier and load in pack.

► **All-Over Control**—When all four cables are tensioned to 500 lb., power is automatically transferred (signalled by a light) to a portable switch control, held by a main operator.

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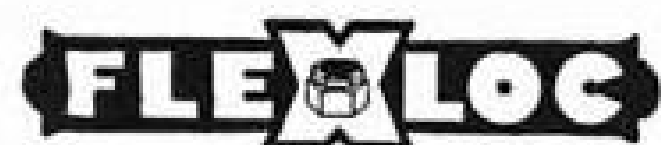
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...are made to latest NAS Specifications. Threads are fully formed by rolling after heat treatment, an important UNBRAKO feature. Full range of standard sizes.

CLOSE-TOLERANCE, HIGH-STRENGTH, SHEAR BOLTS



EXTERNAL WRENCHING NUTS

...incorporate the famous FLEXLOC self-locking principle and one-piece, all-metal construction. The exceptional reliability of this construction has been proved by the millions of FLEXLOCKS used in the aircraft industry.

Other outstanding advantages include:
Maximum tensile with minimum weight
Approved under latest NAS Specifications
Large bearing surface
Positive self-locking—"won't shake loose"
Temperature range to +550° F.

No special tools needed—use standard 12-point socket or box wrenches. Designed for use in cramped quarters
Sizes from 1/4" to 3/4" NF Thread Series
Send for samples and information.



ONE-PIECE SELF-LOCKING NUTS

The one-piece FLEXLOC is both a stop and a lock nut, due to its resilient segments which lock positively, even under extreme vibration. Torque is unusually uniform—within a few inch pounds. "Thin" and "regular" types; NC and NF threads. Officially approved by many U. S. depts., bureaus, etc., and CAA for aircraft use.



Write for further information on these UNBRAKO and FLEXLOC Products.

SPS STANDARD PRESSED STEEL CO.
JENKINTOWN 3, PENNSYLVANIA

Pack Plane Basic Data

General	
Span	109 ft. 3 1/4 in.
Length	83 ft.
Height	24 ft. 10 1/2 in.
Weights	
Design gross, pack on	64,000 lb.
Design cargo	20,000 lb.
Pack	
Length	55 ft. 11 in.
Height, on wheels	11 ft. 2 in.
Width	11 ft. 6 in.
Floor height, above ground	
On wheels	2 ft. 8 1/2 in.
Attached to carrier	3 ft. 5 in.
Floor area	353 sq. ft.
Cargo volume	2700 cu. ft.
Normal passenger seat space for	44
Max. passenger seat space for	66
Litter accommodations	35
Length between clamshells	36 ft. 11 in.
Inside height	8 ft.
Inside min. width at floor	9 ft. 2 in.
Carrier	
Length	50 ft. 6 in.
Max. width	10 ft.
Height	6 ft. 10 in.
Entrance hatch height above ground	12 ft.
Engines: Two P & W R-4360s	3250 hp.
Propellers: Four-blade, 15-ft.-dia. Hamilton Standard.	
Maximum speed	250 mph.

To get a good view of how the hoisting is progressing, the main switch operator climbs a wall ladder inside the pack, his head sticking through a roof opening directly under the main entrance floor hatch to the flight deck.

He raises the pack by pressing a master button on the portable switch, and can use any one of four other buttons to adjust the corresponding lift point to keep the pack's roof deck parallel with the crew nacelle floor deck.

When all ball fittings on the pack are connected to the carrier's orange peel counterparts, four green lights show on the portable switch control. (Pack can also be raised by hand-cranks in crew nacelle.)

► **Stowage**—Cables are then slackened (lowered) by the individual hoist switches, disconnected from the pack hoist fittings, then raised around the pulleys in crew nacelle. As the cable ends pass into the carrier they engage doors to close the openings in the flight deck and wing.

With the pack locked in place, each ground gear is easily dropped by removal of a spring-loaded pin, and stowed within the pack.

Gap between pack and crew nacelle

in locked position is about 2 in. This is sealed by inflating a tubular deicer type boot on top of pack by an air pump located at the rear clamshell.

► **Firm Grip**—Locking mechanism for ball and orange-peel fittings is simple:

The lock handle on the flight deck is placed in the armed open position. As the ball fitting comes up and contacts the top of orange-peel jaw, it rotates the segments of the latter around pivots to clamp the segments over the ball and also causing a roller on top of each segment to push out of a detent on the bottom of a spring-loaded plunger.

This causes the plunger to drop, carrying a roller attached to it down to the track of a surrounding cylindrical cam (armed locked position).

The control handle is then thrown to the locked position, the cam housing sprocket being rotated by chain, so that the cam roller (on the plunger) is placed in the close-fitting end of the cam track in a secure position.

For release, when all four cables have 500-lb. tension, the manual control handle is moved to the armed locked position, then to the release position.

► **Second Floor**—The crew nacelle is comprised of a nose section, crew compartment and equipment section.

The nose section extends forward from aft of the instrument panel and is hinged at the top to swing up for easy access to instrument installations.

Crew compartment, extending from instrument panel back to front spar of wing carry-through structure, is entered through a trap-door type opening just aft of pilot's seat.

Access from the ground, when pack is not in place, is by a Fairchild-designed accordion-type aluminum alloy ladder, which hooks to crew compartment floor fittings. Collapsed, the ladder stows in about 3 ft. of vertical space under navigator's table.

Aft of the cockpit on copilot's side is the flight engineer's (crew-chief's) seat. This slides on diagonal tracks to allow him to come into position between pilot and copilot so he can observe the instrument panel and pedestal. He has no separate panel station.

Aft of the flight engineer's seat is the navigator's station, and opposite on the left side of crew compartment is the radioman's station.

► **Compact Arrangement**—After this is the wing carry-through structure, 38 1/2 in. deep, forming the floor of a short crawlway to the nacelle's equipment section at the rear.

In the equipment section are eight 200,000 Btu. heaters, four on each side of the passageway, for the anti-icing system and heating of the crew nacelle. There is also a small chemical toilet (forward of heaters) and a hydraulic powerpack for brake operation and

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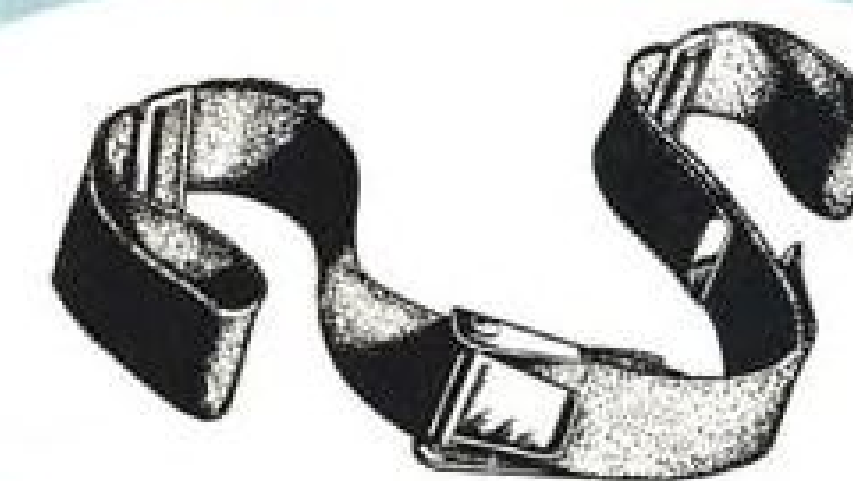
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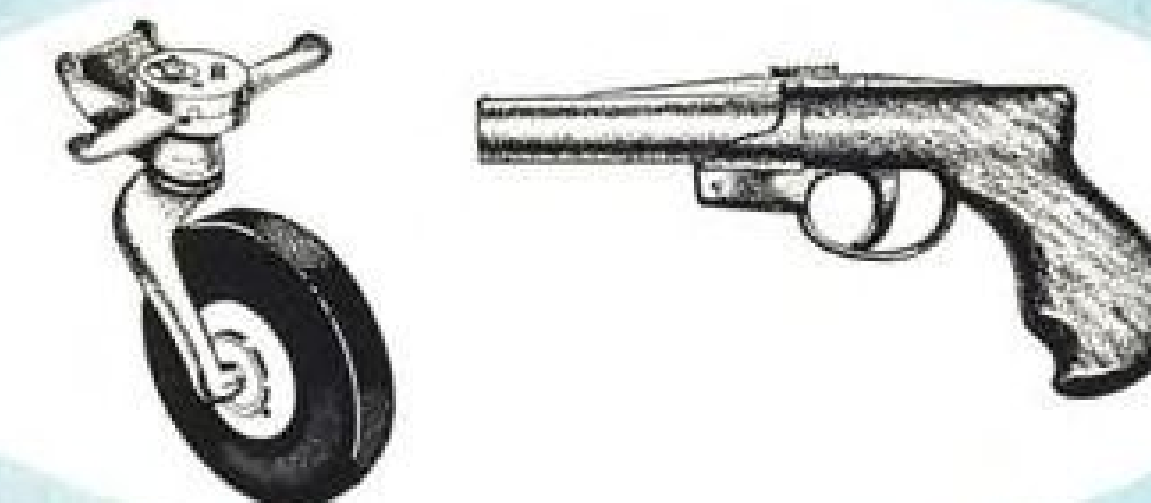
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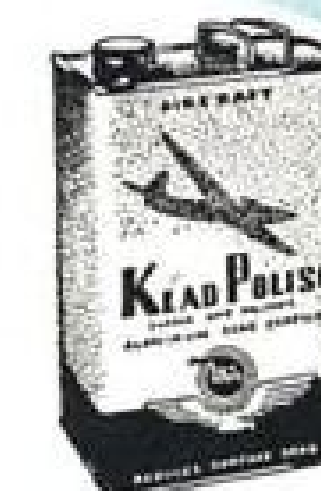
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landing gear steering.

Aft of the heaters, in the center, is the auxiliary power unit. In the very end of the crew nacelle is the life raft compartment.

Though the crew nacelle has numerous items of equipment, ducts, wiring, tables, etc., there is ample room for easy movement.

► **How Gear Evolved**—Landing gear configuration posed a considerable problem.

A nose gear unit could not be used because of requirements for pack removability from under carrier in a fore or aft direction, plus the fact that the bottom of the carrier was too high for a strut of reasonable length.

A tail gear was not considered for the same reasons.

A truck-type combination of main and nose gear also was ruled out because wheelbase would have to be limited by lack of room in the engine nacelle for stowage of the retracted gear.

A quadricycle arrangement finally was selected, with separate structural supports for the auxiliary (nose) and main units. Both retract aft into the engine nacelle and occupy a considerable cavity. Actuation is by a motor-operated screwjack.

► **Special Fitting**—One of the hurdles in the gear design was a supporting strut in the vicinity of the engine mount. This was essentially a problem of placement to obtain sufficient clearance for easy engine removal without strut interference.

After considerable study, the strut was located outside the mount frame by use of a special "bathtub" fitting. This accommodates the engine mount attachment end on top of the strut attachment point so that the former may be removed without disturbing the support strut.

Except for the upper drag links and aft stowing, main gear is same as that on the C-119B.

► **Wheel Steering**—The auxiliary gear extends forward under the Pratt & Whitney R-4360 powerplant. The gear was made steerable, with differential positioning between left and right assemblies to eliminate any dragging of the outboard wheels in a turn. Difference varies with the radius of turn and may be as much as 20 deg.

However, the steering system was disconnected during early trials and it may be continued this way because of the plane's favorable ground handling characteristics.

Auxiliary unit structure is covered with a wide front fairing. Clearance between fairing and the Hamilton Standard 15-ft., four-blade paddle-type propeller is about 9 in.

Landing gear tread is 29 ft. 2 in. Wheelbase is 15 ft. 7 in.



Rings and blanks of varying diameters produced by the CENTRI-DIE process. Shown as cast and rough-machined.

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Lebanon also produces centrifugal castings in refractory molds—in any quantities. Illustration shows typical casting made by this process.

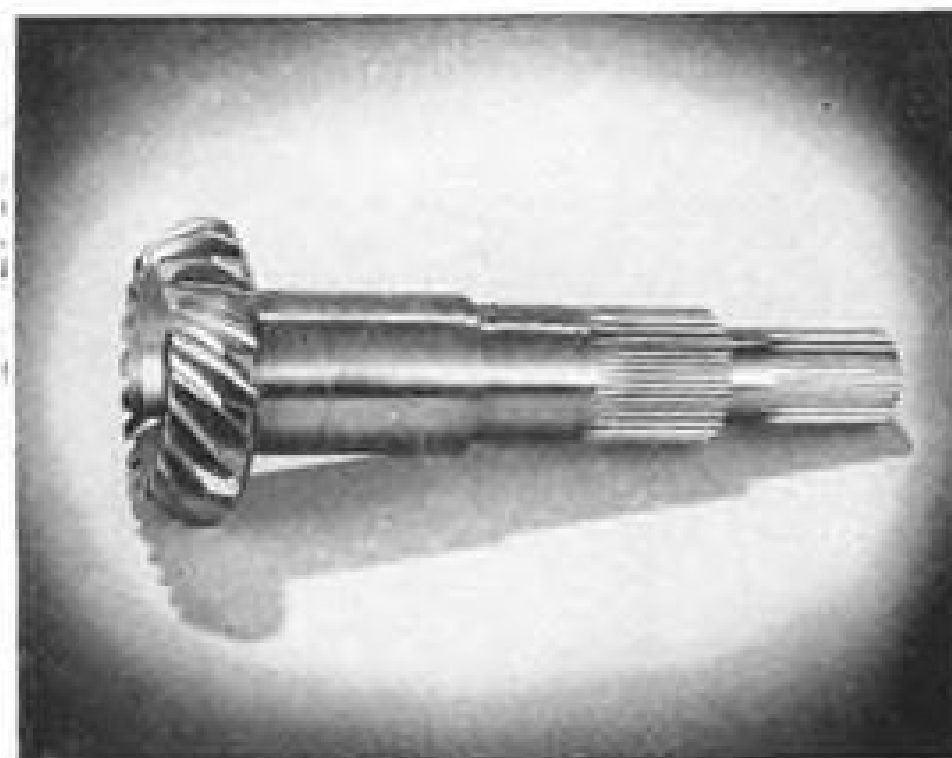
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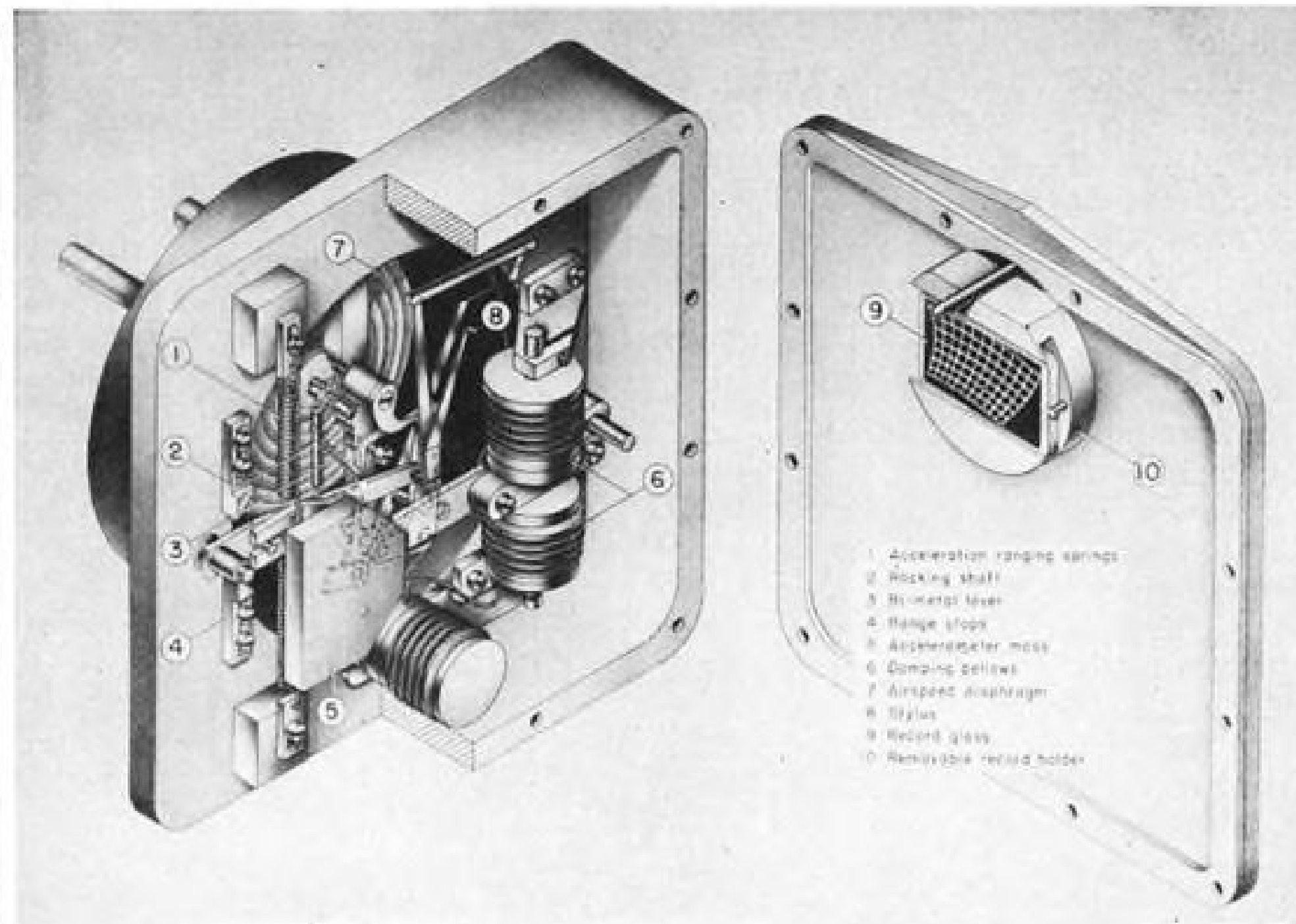
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More Accuracy for V-G Recorder

Studies of the effects of atmospheric turbulence encountered by aircraft in routine operational flight will be facilitated by an improved V-G (velocity-gravity) recorder developed at the National Advisory Committee for Aeronautics Langley Laboratory. Highlight of the new unit is an oil-damping scheme.

NACA's original V-G recorder had an accelerometer unit damped by dry friction. Suitable records could be secured if accelerometer damping were adjusted correctly in each specific application.

But adjustment was difficult because it had to be made in the field by relatively inexperienced personnel.

And changes in damping occurred with time and operating conditions.

Also, a study of the unit's frequency-response characteristics indicated that even with optimum damping adjustment, response would have to be improved to cope with the problem of higher plane speeds bringing a higher rate of rise and decay of accelerations from gusts.

► **New Advantages**—The new recorder, according to NACA Technical Note 2194, October, 1950, "The NACA Oil-Damped V-G Recorder," by Israel Taback, eliminates major limitations of the friction-damped device:

- It requires no adjustment.
- Has more accurate acceleration-recording characteristics.
- Has adequate damping to eliminate resonances at vibration frequencies.
- Shows no evidence of rectification under sinusoidal acceleration inputs.

► **Components**—The new recorder comprises a temperature-compensated air-speed unit and an oil-damped accelera-

tion mechanism for graphing forward velocity of the plane and simultaneous values of its normal acceleration.

Recording is by a stylus scratching a smoked glass screen.

Vertical motions of the accelerometer mass, opposed by retarding force of springs and damping bellows, are magnified and transferred to the stylus arm. Rotational deflections of the airspeed link are transmitted to the stylus by a short link.

The airspeed mechanism is a commercial unit similar to those used in airspeed indicators.

Accelerometer mechanism is a mass-spring system damped by bellows filled with oil having a low viscosity-temperature coefficient. Range is adjusted by springs of proper constant, damping by using a silicone oil of proper viscosity.

► **Compensator**—A damping compensator is included between the bellows units to give approximately constant damping throughout a wide temperature range. This device has a gate actuated by a spiral bimetal strip, which opens bypass capillaries between the bellows, so that an increase in oil viscosity with temperature is accompanied by a corresponding decrease in flow resistance between the bellows. Net effect: Damping remains approximately constant throughout a wide temperature range.

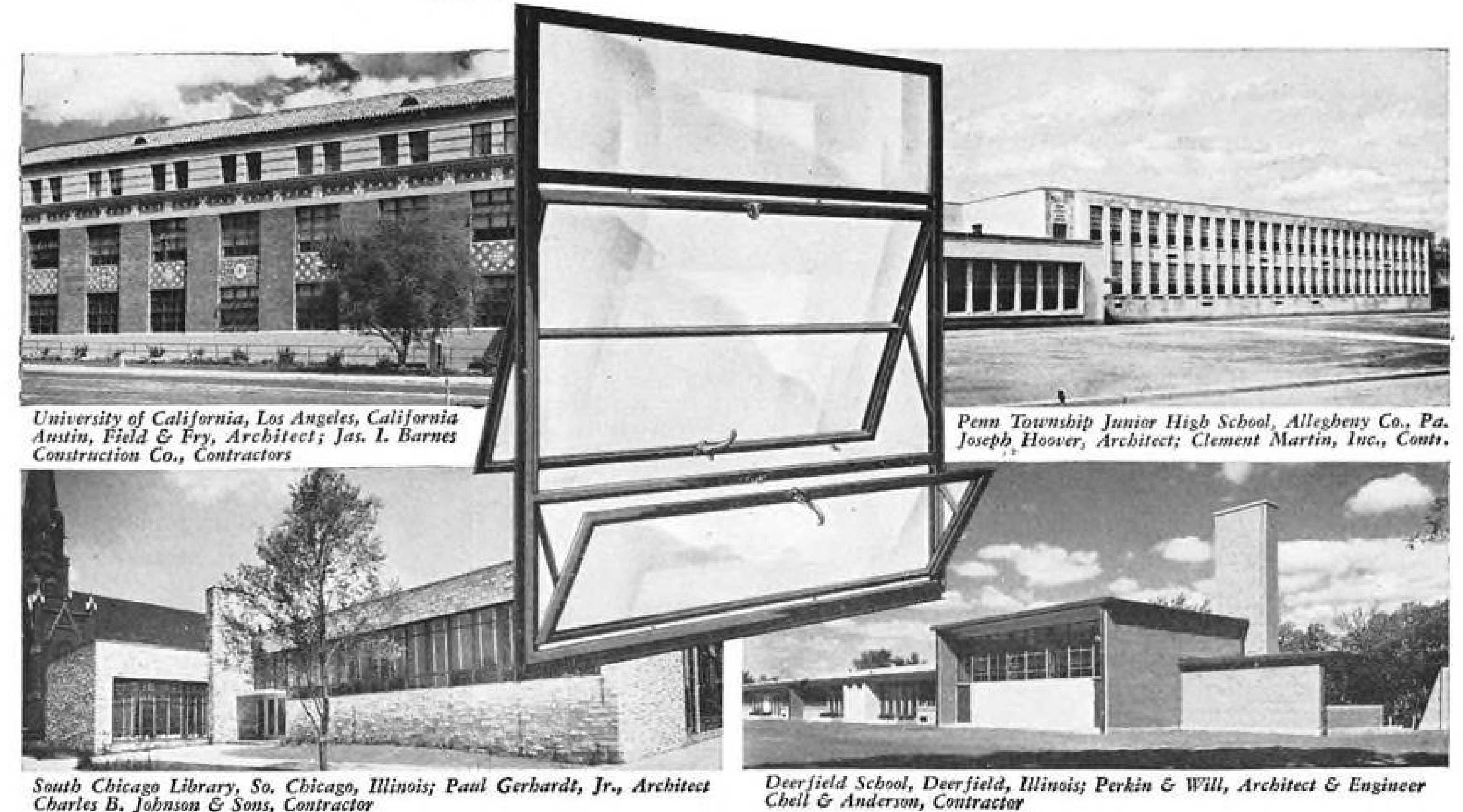
Temperature compensator is adjusted before assembly of the bellows mechanism and no additional adjustment is required, regardless of the acceleration range of the recorder.

Range of the acceleration linkage in G-units is -3 to 6 ; range of the airspeed linkage in mph. is 0 to 200 . Both ranges can be made greater.



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The Lear Automatic Pilot *is here... and it's great!*

Progress in aviation is not always achieved at the same even rate. Sometimes it inches along with very little change; other times it picks up speed and travels at a gallop. And on very rare occasions—as now, for example, with the perfection of the Lear L-2 Automatic Pilot an accomplished fact after seven long years of designing, engineering, and testing—aviation suddenly leaps ahead into an *entirely new era* of flight safety and simplicity.

Yet, new as it is, the Lear L-2 Autopilot is by no means untried—by no means merely a promise of things to come. Already installed in Navions, Bonanzas, Cessnas, DC-3's, Lodestars and Twin Beeches, and with many thousands of customer-hours behind it, the L-2 autopilot is today a fully proved, widely accepted, readily purchasable *reality*.

WHAT WILL IT DO? (1) The L-2 will hold your airplane laterally and longitudinally level in fair weather or foul, in turbulent air or smooth, without requiring a finger or foot at the airplane's controls. (2) It will hold your airplane on any course you select and hold it automatically, accurately, and smoothly. (3) It will enable you to alter this course at will in a smoothly coordinated, automatically executed turn. (4) It will automatically maintain your airplane in any desired safe angle of climb or descent. (5) It will automatically maintain your airplane in any desired safe climbing or descending turn.

In other words, the L-2 is both a *stabilizing* and *maneuvering* automatic pilot, operating on all three axes—roll (aileron), pitch (elevator), and yaw (rudder).

NOW LET US TRANSLATE these five basic functions of the Lear L-2 Autopilot into

the actualities of everyday flying. What does the automatic flight control of the L-2 mean to you, the private owner or business executive, who depends upon his plane to provide the maximum in safe, efficient, and pleasurable transportation?

It means that all you have to do is turn on the L-2 engage switch and then sit back comfortably for the entire trip, regardless of its length or the weather you encounter, without once touching the airplane controls except for the actual takeoff and landing. (As a matter of fact, the sensitivity of the L-2 is such that it will even take off and land your plane automatically, although it is not designed or recommended for this.) On a long trip the constant muscular effort and nervous strain of manually controlling your plane tax your energy and mental alertness to a considerable, sometimes dangerous, degree. Relieved of this fatiguing burden by the L-2, you will remain physically and mentally relaxed for the brain work that safe flying requires. You will be able to fly many more hours a day than you ever did before and still feel refreshed enough to go about your business when you land.

IT MEANS SMOOTHER FLYING and consequently less airsickness for your passengers and greater comfort for yourself. In rough air the L-2 checks the airplane's rolling, pitching, and yawing movements *before* they develop any appreciable magnitude.

It means that while the L-2 flies your plane, you will be completely free to converse with your passengers; handle your radio communications; write down the weather sequences and winds aloft; make entries in your position log; figure your ETA's; re-plot your course on the chart in case of bad weather; attend to your numer-

ous duties after takeoff and before landings; keep a lookout for other traffic, etc. And it means, furthermore, that you will be able to do all these things leisurely, undistractedly, and accurately.

IT MEANS GREATLY INCREASED safety while you maneuver at low altitude and low airspeed to observe roof markers, check points, strange fields, runway conditions, wind socks, etc. While your attention is outside the plane, the plane can be maneuvered automatically and safely in perfect turns and constant altitude.

It means greatly increased accuracy in navigation. Most navigational difficulties are caused not so much by poor calculation as by the poor steering brought on by compass errors, rough air, restricted visibility, and pilot fatigue. The L-2 will hold an accurate course in the roughest air.

It means that you fly faster and use less gas because you are able to fly straighter, because you are able to hold your altitude and maximum cruising speed once you have established them, and because you are able to maintain efficient constant-rate climbs and descents.

IT MEANS COMPLETELY AUTOMATIC control when emergencies occur. For example, in case of engine failure in multi-engine aircraft, the L-2 will instantly correct for the yaw due to unbalanced power and automatically hold the plane straight and level. An owner of a single-engine airplane equipped with an L-2 Autopilot claims that it recently saved his airplane by taking over the flying when an engine fuel-pump failure required his full attention to pumping gas by hand.

The L-2 can mean the difference between life and death for the VFR pilot

accidentally caught off base in instrument weather. Although Lear does not recommend intentional instrument flying with the L-2 unless you are properly licensed and equipped for such flying, it is a known fact that practically every pilot sometimes gets into conditions beyond his equipment and training. However, bad weather makes little difference to the L-2—it flies just as well in zero-zero conditions as it does in CAVU. A test pilot flying a Bonanza equipped with a Lear L-2 Autopilot deliberately entered a cold-front thunderstorm and came out on exactly the same heading he went in, although the hail-laden currents within the storm were so violent that the paint was stripped bare from the leading edge of his wing. No structural damage

occurred, however, because the L-2 kept the plane in a constant attitude—no dives, no high "g" pull-outs.

It means greatly increased peace of mind while flying at night, which can also be treacherous to the non-instrument pilot.

FOR THE QUALIFIED INSTRUMENT PILOT the L-2 has as many advantages as it has for the fair weather pilot. It means, first of all, relief from the strain and hypnosis dangers of prolonged instrument flying. With all due respect to your ability, there isn't a pilot in the world who can do as good a job on the "gauges" as the L-2.

Flying with the L-2 takes most of the grief out of radio range problems, beam bracketing, and ILS approaches. To

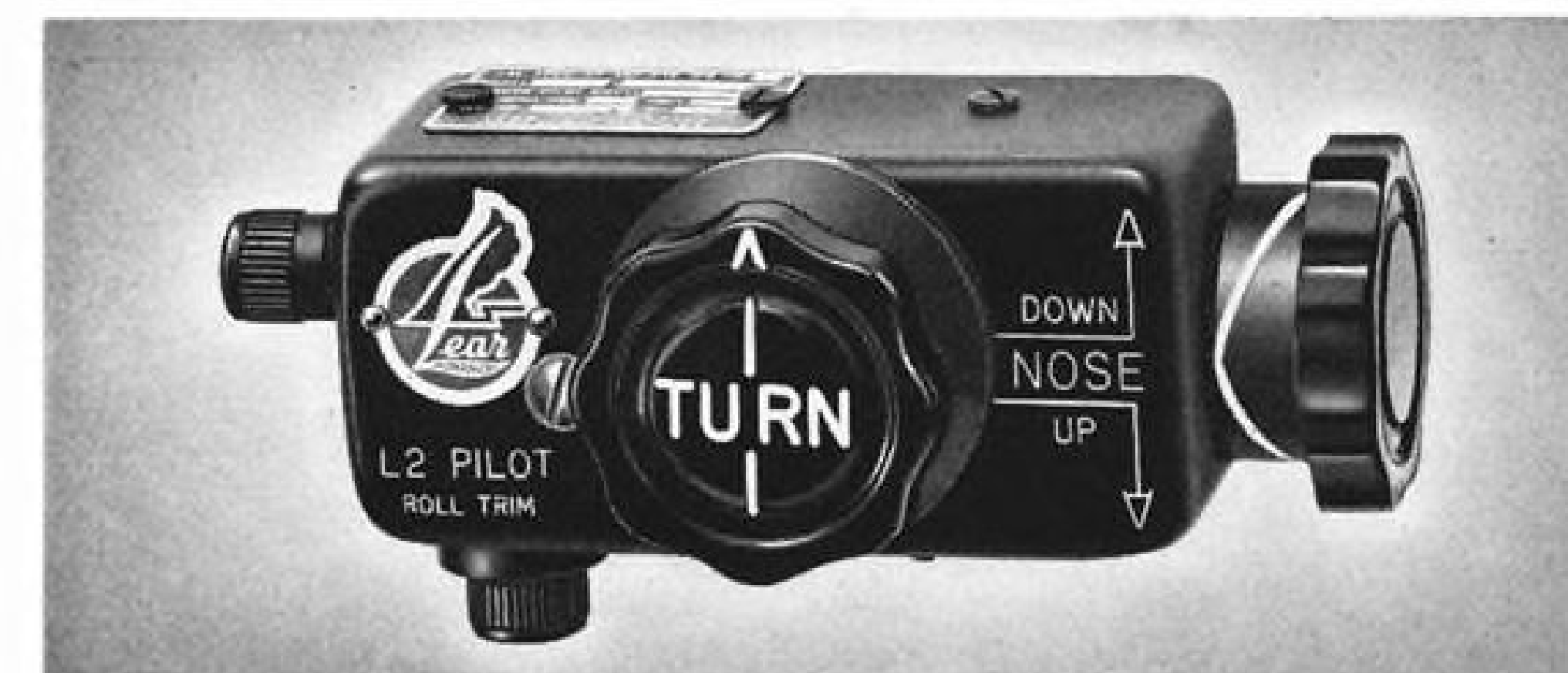
change course you merely rotate the "Turn" knob on the Controller. Your plane turns smoothly and automatically, and stops turning exactly—but *exactly*—where you want it to stop. To descend, you merely rotate the "Pitch" knob on the Controller for the desired rate of descent, and the L-2 will bring you down from the markers strictly according to the book.

"Holding" over a fix with the L-2 is simplicity itself. You do it just as the airlines do—with a minimum of effort and at exactly the altitude and position at which you are supposed to hold.

THE L-2 IS SIMPLE TO OPERATE, easy to install, and weighs less than 30 pounds (without gyros). The price of the L-2 is \$2990, and includes a set of excellent directional and horizon gyros, which replace the ones you normally use for visual reference. The L-2 also contains provisions for adding the Lear Automatic Approach Coupler and the Lear Automatic Altitude Control.

With the Lear L-2 Autopilot in your plane your experience of flying will have no resemblance to anything you have known in the past. You will discover air transportation at its best, its safest, and its most enjoyable. You will certainly want to know more about this remarkable instrument, so we have prepared a comprehensive book entitled *The Lear L-2 Autopilot* which describes its operation and functions in full detail. We invite you to send for your copy today—free, of course.

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The L-2 is unbelievably easy to operate. Turn on the engage switch and your plane is under complete stabilized control on all three axes! To make a turn, simply rotate the "Turn" knob in the desired direction. Stop the turn by moving the knob back to the neutral position. To climb, just roll the "Pitch" knob backward. To descend, roll it forward. The L-2 can be easily overpowered by the pilot, and instantly disengaged by the flip of a fingertip switch on the control wheel. Automatic trim tab control keeps the plane constantly in trim on the pitch axis, thus assuring a normal, no-load condition on the elevators whenever the L-2 is suddenly disengaged to permit manual flight.

THE L-2 STABILIZES YOUR PLANE AUTOMATICALLY

(Amount of deviation shown here has been deliberately exaggerated. In actual practice, the L-2 prevents deviations before they develop.)

When a gust hits and a wing goes down...



the L-2 goes into action instantly, applying exactly the right amount of corrective control.

If for any reason the plane is thrown off the established pitch attitude...



the L-2 elevator servo brings it back. Necessary trim changes are made automatically.

If the plane deviates by even a single degree from the established heading...



the L-2 rudder servo immediately applies a proportionate amount of correction, but without lag or overswing.

THE L-2 MANEUVERS YOUR PLANE AUTOMATICALLY



You get a smoothly coordinated, constant-bank turn by simply rotating the "Turn" knob on the Controller. A great aid to accuracy in contact flying—invaluable for instrument and night flying.



The L-2 will hold your plane automatically in a safe constant-rate climb or descent, at the same time maintaining a fixed heading and a wing-level attitude.

With the L-2 you can execute automatically controlled climbing and descending turns—a feature you will appreciate especially after takeoff and on landing approach.





Red Defender: MIG-15 Interceptor

Sweptwing jet aircraft compares to USAF F-86 Sabre, but has edge in maneuverability and heavy armament.

(McGraw-Hill World News)

London—The existence of a Russian sweptwing, single-seat fighter already in service has been confirmed by the British Air Ministry. Reports of several sweptwing machines flying in Russia had persisted for months before the official announcement, and it is certain that at least one other fighter designed along similar lines is now ready for production.

The drawing here is based on a provisional official three-view and two photographs.

The new fighter, an MIG interceptor design, is revealed as a sleek midwing, tricycle-undercarriage machine with aerodynamic layout as advanced as any service fighter flying elsewhere. Previous MIG jets were the MIG-9 twin-axial-flow-engine single-seater of early postwar vintage, and a single-jet "pod and boom" design flying in 1947 (presumably MIG-11). Since Soviet fighters are invariably allotted odd type numbers, and assuming the Russians skip the designation number 13, the latest MIG comes out as the type 15.

► **Swept Surfaces**—Rough measurements from the photos indicate that the wing and tail sweepback is 35 degrees. The medium-span wing has a slightly tapered, low-aspect-ratio planform, giving a favorable lift area and loading, while having the sweepback and thinnish section necessary for near sonic speeds. A large swept fin, two-piece rudder, and

swept horizontal tail should provide good stability and control right up the Mach scale.

► **Powerplant**—Engine type is not known, but from the short, round fuselage and the fact that the nose intake is divided to pass the air on either side of the cockpit, it appears that a centrifugal-flow jet is fitted. This would be a Chelomey unit based on the Rolls-Royce Nene or Derwent.

With its inherent simplicity and moderate sensitivity regarding production materials as compared with axial-flow designs, this type engine should be well suited to Russian methods of quantity production. Even so, there seems little doubt that, like the Americans and British, the Reds are concentrating on axial-flow engines, though probably for different reasons.

Interesting powerplant details are the large diameter of the nose intake, and the way the tail pipe is cut back beneath the vertical tail surfaces—presumably designed to reduce thrust losses aft of the turbine.

► **Cannon-Armed**—Armament is apparently two guns in the front fuselage belly, one of 30mm. calibre and the other 20mm. For some time the Russians have followed the German lead in fitting shell guns heavier than the standard 20mm. European weapon, or the American .50 caliber machine-gun.

Small caliber automatic weapons have been discarded on most new Soviet machines and replaced by 20mm. and

30mm. cannon on fighters, and high velocity weapons up to 53mm. on some of the heavier Russian ground attack machines.

Another equipment feature of the MIG-15 is the fitting of an ejector seat. Seat ejection was tried out by the Russians several years ago, initially with the seat installed in the aft fuselage of a PE-2 light bomber. There has been plenty of time for the seat to be perfected and produced in quantity for the newest jets.

► **Interceptor Use**—Range of the compact little fighter is likely to be short, as befits its primary role as an interceptor. There seems to be little space for fuel other than just behind the cockpit and in those parts of the wing root which are not taken up by the main undercarriage units. The landing gear main legs fold inward towards the fuselage. The nose wheel is stowed within the front fuselage between the cannon.

Assuming the MIG-15 follows the Russian fighter tradition of light weight and small size, the combination of medium span, low aspect ratio and loading and generous control surfaces should give it very superior climb, roll-rate, and maneuverability. The Russian may be able to roll faster or turn tighter than the F-86 Sabre, which almost certainly will have a greater wing loading. While the MIG's top speed, around 640 mph., is inferior to that of the F-86, in actual combat it could be a formidable opponent for the American fighter, and may have the edge in hitting power by means of its longer-range, heavier caliber armament.—Roy Cross

Photoelastic Study Conducted at IIT

General methods of three-dimensional photoelastic stress analysis are to be developed under the terms of a grant awarded to Dr. Max M. Frocht of Illinois Institute of Technology by the National Advisory Committee for Aeronautics.

► **Done with Light**—Photoelasticity is an experimental method of stress analysis. It utilizes polarized light to see through transparent models of objects and to produce a color pattern which is directly related to the internal stresses in the object.

Photoelastic studies have been most generally confined to two-dimensional bodies, although a limited amount of work has been done with three-dimensional studies. This latter work has been limited to symmetrical objects.

Foundation stone of the entire problem is the ability to fix the stress pattern permanently into the material after the loads have been removed.

Princess Readied For Long-Range Role

Progress with the first Saunders-Roe Princess—140-ton British flying boat—indicates that this huge liner will be ready for flight trials in the fall or winter of 1951, perhaps in time for an appearance at the Society of British Aircraft Constructors' Farnborough display.

Reports are that the second and third Princesses initially should take to the air in the succeeding five-month intervals.

► **Engines Soon**—First of the Bristol Proteus turboprop engines for the craft, which will mount ten powerplants—four coupled pairs and two singles—will be delivered before the end of this year. Complete engine delivery is slated for the middle of '51.

Meanwhile, a coupled unit is being test-run on a Princess wing section. And Bristol engineers are working on the Mark III version of the engine, which is expected to bring the speed of the craft to 385 mph.; range, to 5500 mi.

Choice of turboprop power is considered to be the logical solution for the craft's transport role (AVIATION WEEK, May 22).

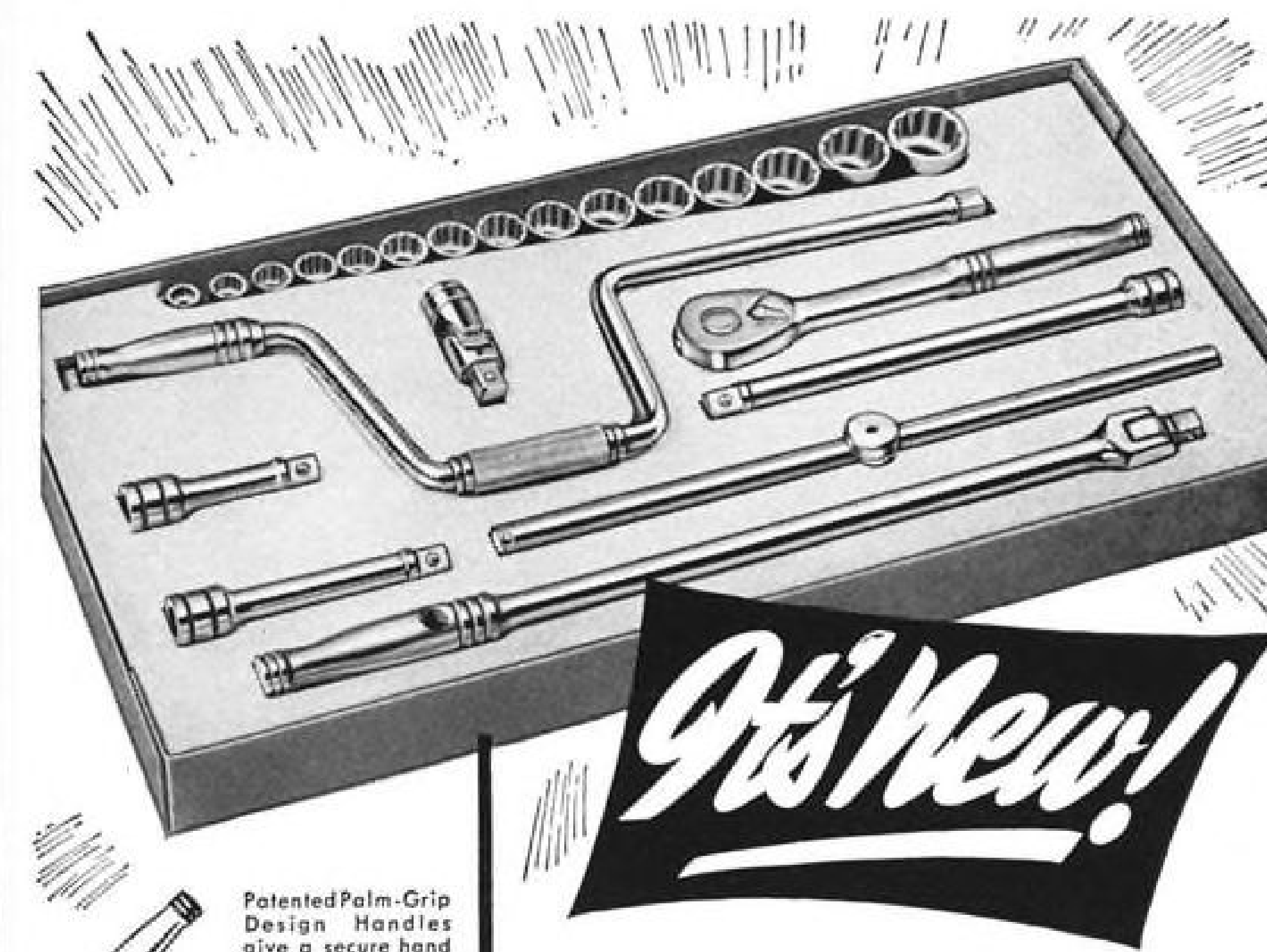
► **Work Status**—An indication of the enormity of the 105-passenger Princess is reflected in its material requirements—40 mi. of electric cable, 10 mi. of extrusions, 2½ acres of light plate.

The hull is complete externally, and inner wing sections have been attached. Outer wing panels will be fitted when the craft is taken out of the hangar early next year, as will be the fin's top 10 ft. (too high for hangar).

► **Plans Made**—British Overseas Airways Corp., meanwhile, is preparing to put the flying boats into service in 1953, by formation of a group to prepare the line's Hythe flying boat base with engineering and maintenance equipment to accommodate the Princess. Another job will be to develop economic and operational data.

► **Route Possibilities**—While ultimate decision on routes will depend on BOAC's flight trials and the general transport picture at service time, Saunders-Roe already has studied the possibilities, its analyses indicating that the craft will be suitable for nearly all routes available to the considerably smaller Short Solent. And it estimates the Princess' landing run to almost approximate the Solent's.

Preliminary route forecasts indicate that the London-Johannesburg run with single stop at Lagos will require less than 24 hours; London-Australia about 50 hours, allowing for stops, and another 5½ hours to bring in New Zealand.



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And, you're money ahead with Chevrolet's special features. Chevrolet features like Valve-in-Head engine, Power-Jet carburetor and many others exclusive in the field.

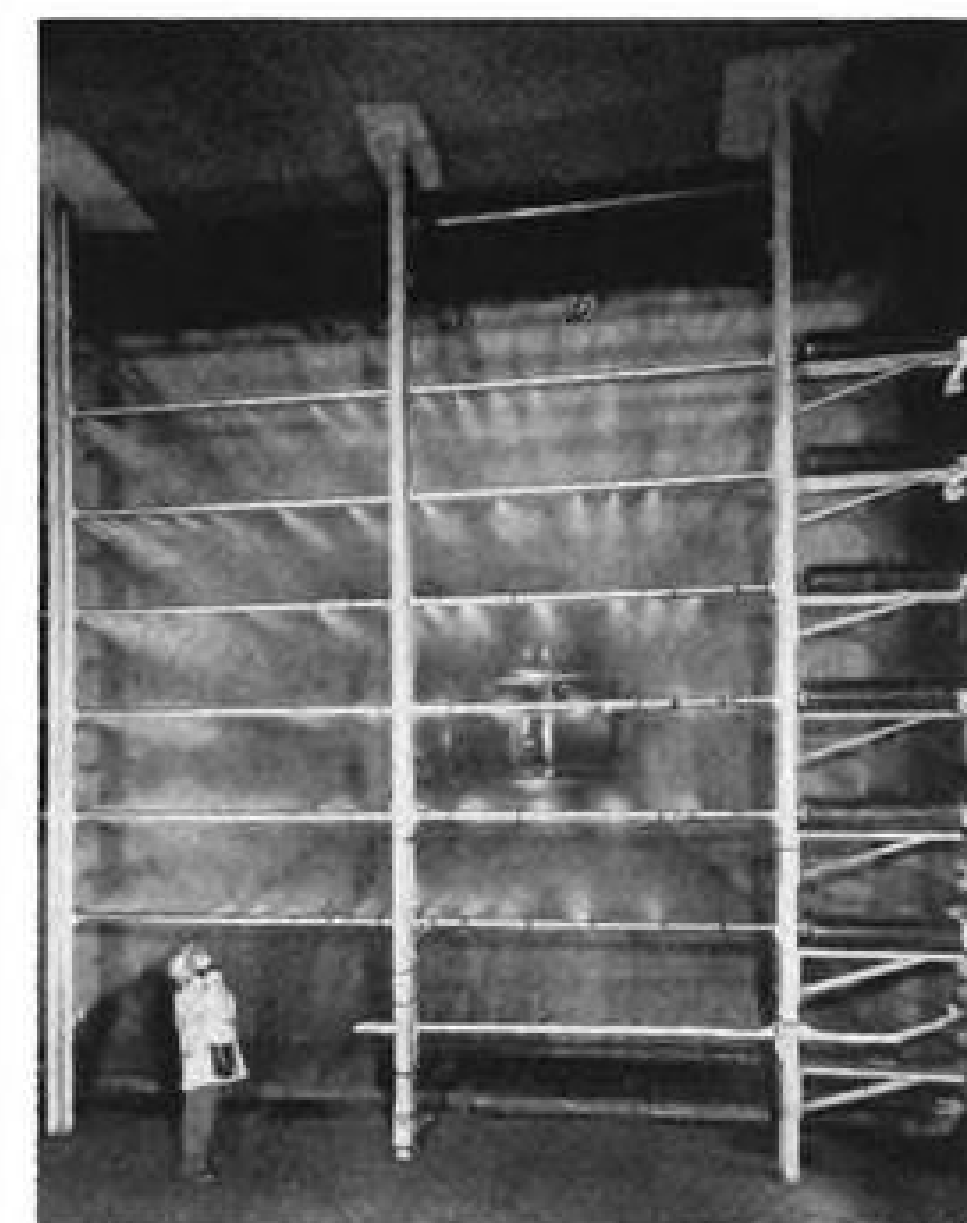
You're money ahead because Chevrolet has a model built for your job . . . a truck engineered to the special requirements of that job and built to do it faster, better, more efficiently.

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CHEVROLET MOTOR DIVISION, General Motors Corporation
DETROIT 2, MICHIGAN



CHEVROLET ADVANCE-DESIGN TRUCKS



This tunnel spray system for simulating icing clouds is NACA's novel method for gathering icing data without necessity for flight trials. Each horizontal strut has special air-water nozzles. Controls are housed in airfoil section at tube ends.



Two types of icing rate meters in Lewis Lab icing tunnel. These instruments are being installed on airline (Northwest, American, and United) planes for getting statistical data on extent, intensity and frequency of icing on continental routes.

Icing Clouds Simulated in Tunnel

Research facility develops ingenious spray system to supply data usually obtained in flight trials.

Icing clouds now are being made to order in a wind tunnel to eliminate the hazard and expense of gathering icing data by flight research.

Technicians at the Lewis Flight Propulsion Laboratory of the National Advisory Committee for Aeronautics are pushing tunnel studies to determine icing characteristics and protection requirements of components of all-weather aircraft.

► **Air to Ground**—To make sure that simulated conditions in the tunnel would be true to those existing aloft, they first developed special instruments and measured liquid water content and droplet size in natural icing clouds by flight research.

Then they developed an icing tunnel spray scheme to duplicate these phenomena under controlled conditions.

► **Special Nozzles**—Nozzles were an initial problem. Commercial units couldn't meet the exacting, severe conditions of icing research, and drops produced were too large. After a comprehensive study they came up with an air-injection-type that would give natural conditions.

The nozzle is an air atomizing coaxial unit. It carries water through a central passage and ejects it as a solid stream from a very small tube into a high-velocity coaxial air jet, atomizing the water into 5 to 70-micron-diameter droplets.

Regulation of air and water pressure control quantity of water and droplet size to achieve natural icing conditions.

► **Spray Setup**—Next, a spray system was developed to accommodate the nozzles and supply sufficient flexibility to control cloud size, location, uniformity and density.

The scheme incorporates six 20-ft. struts placed horizontally in about 24-ft. increments. The struts have holes for nozzle installation every 2 in. Because a pattern providing a uniform cloud of specific water content requires a non-symmetrical nozzle pattern, special plugs are used to fill the appropriate openings.

An inner tube in each strut, supplying water to the nozzles, is surrounded by a space for carrying the air. A steam and condensate system is incorporated to prevent freeze-up when tunnel temperature is below freezing and the spray system is inoperative.

The entire system uses about 1000 lb. of water and 4000 lb. of air per hour.

System controls are housed in small airfoil sections at the strut ends, with remote operation from the tunnel's main control room.

The tunnel work was conducted by D. R. Mulholland and his associates under supervision of Vern G. Rollin, Acting Chief of the Icing Research Branch.

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Destroyer... OR Rescuer

From the versatile family of Wright Cyclones comes the power that meets the differing needs of these aircraft . . . economical power . . . power ideally suited to long-range operations.

► **The Lockheed P2V-4 Neptune** . . . U. S. Navy long-range patrol bomber . . . is powered by two Wright Turbo-Cyclone 18 compound engines. This descendant of the famous "Truculent Turtle" brings to its anti-submarine warfare operations great stamina, long range and heavy striking power.

► **The Piasecki H-21 Rescuer** . . . a Wright Cyclone 9 powers the great 44 foot rotors of this U. S. Air Force's Arctic Rescue Helicopter . . . which lands as readily on snow and ice as on water or marshland . . . without changing the landing gear.

► The six aircraft shown below do other important jobs. Each has its own special power needs—and Wright engines power them all. The future will bring new needs, and Wright engineering and production teams are ready to handle them.



POWER PLANT FOR THE RESCUER — The Wright Cyclone 9 in the Piasecki H-21 is rated at 1525 h.p. and has a low specific weight of .91 lbs. per h.p. Other advantages are . . . outstanding cooling characteristics, service accessibility, simplicity of maintenance.

WRIGHT Aeronautical Corporation, Wood-Ridge, N. J.
A DIVISION OF CURTISS-WRIGHT CORPORATION

Lockheed Constellation



Chase C122 Avitruc



Douglas Skyraider



Martin P5M Marlin



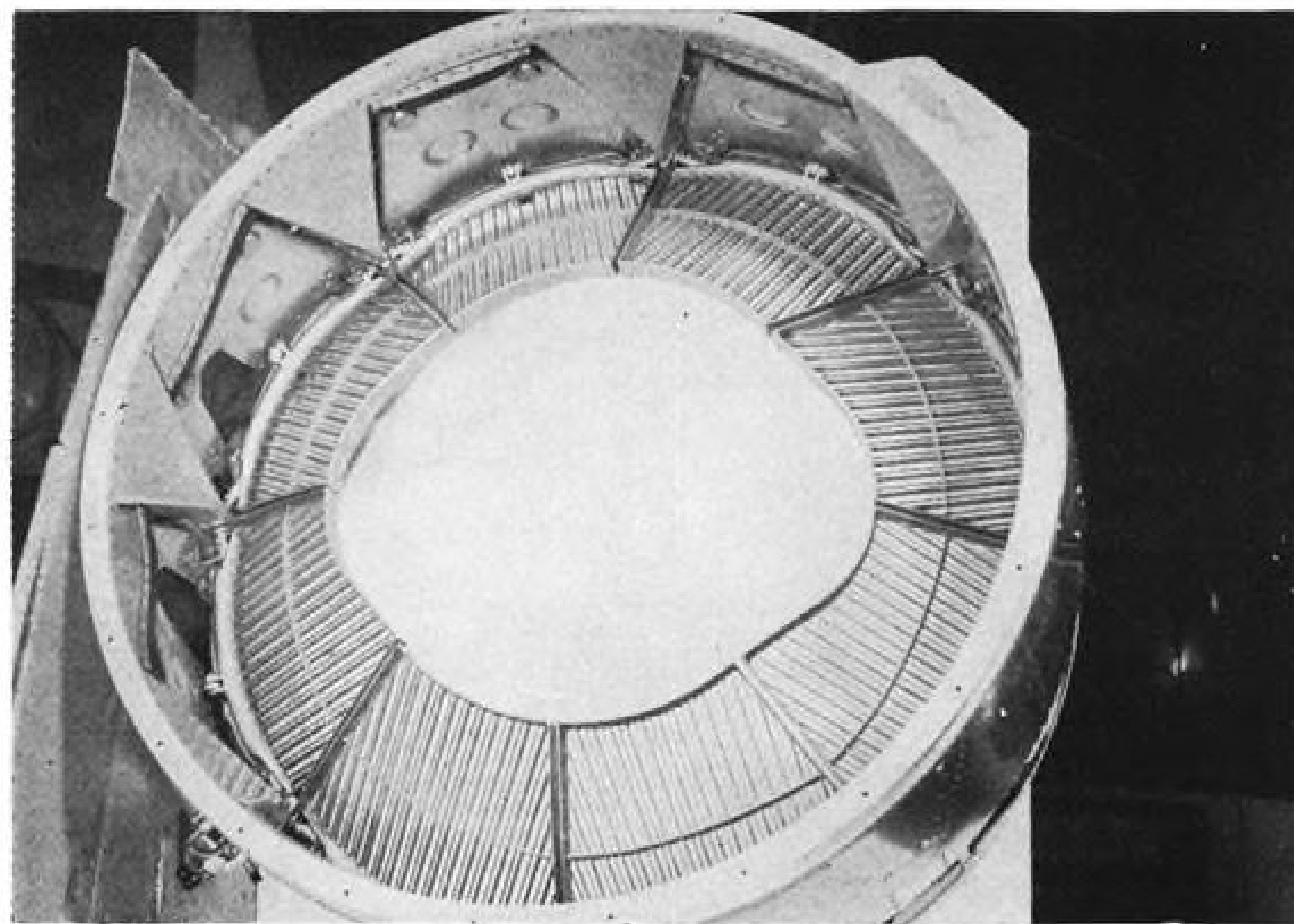
North American T-28 Trainer



Northrop C125 Raider



EQUIPMENT



Air intake screen for axial flow jet engines. Duct doors are visible in retracted position.

Screens Keep Jet Engines Clean

Axial flow jet engine makers are testing Smith-Morris' latest units; wide application seen.

By George L. Christian

Detroit—The Korean war is proving to be an interesting aeronautical classroom.

One of the lessons getting speedy action from jet engine manufacturers is that axial-flow engines cannot inhale combat debris, according to T. N. Kelly, designer of one of the first practical, retractable jet air inlet screens.

Kelly, chief engineer of the Smith-Morris Co., Detroit, manufacturers of the screen, told AVIATION WEEK that although the axial-flow-type jet's vulnerability to debris entering with intake air has been known ever since the engines were first built, the danger of combat debris was not brought home until the Korean war.

► **Initial Success**—The prototype model, built in peacetime (1949) to prevent the engines from ingesting foreign matter such as stones and birds, proved so successful that Allison wanted more, said Kelly. The USAF and General Electric took note, and in approximately one year Smith-Morris have brought the application of its retractable screen up to this status:

- Two Allison development contracts have been completed.
- One USAF development contract has been completed.

• Two development contracts with General Electric and one with A. V. Roe Canada, Ltd. are currently under way. Kelly said that GE had been working on a similar project for some time, but discarded its project after it had experimented with the Smith-Morris unit.

The screen has also been responsible for two additions to the Smith-Morris plant, 825 Myrtle St., Ferndale, a suburb of Detroit.

The company, whose small factory until recently was entirely occupied with the manufacture of high-temperature sheet metal products such as jet tailpipe bellows and aircraft exhaust manifold systems, got into the screen business as a result of an inquiry from the Power Plant Laboratory, installation section, Air Materiel Command, Wright-Patterson AFB.

► **High Strength With Little Interference**—The problem was to build a screen which would keep debris out of axial-flow jet engines, be retractable in case icing conditions were encountered, strong enough to ward off large pieces of foreign matter, yet interfere as little as possible with air flow and fuel consumption of the engine.

Kelly said the problem was difficult to solve, but claims that his latest type of screen causes only 1½ percent thrust

loss and 2 percent increase in fuel consumption.

The first three units were built in August, 1949. They did not include duct doors (which close the air intake in case the engine becomes inoperative). The screens were operated by electro-mechanical actuators, and all the screen elements were of the same size.

One screen system wintered on top of Mt. Washington, installed in the nose of an Allison J-35. Kelly said it passed the ice tests very creditably.

The other two screens were subjected to debris tests. One was finally damaged by throwing a good-sized socket wrench into the intake. The actuating linkage did break, but the wrench was kept out of the engine and "you could have continued to aviate for a while were the engine installed on an airplane," according to Kelly.

► **Design Improvements**—As a result of these tests, certain deficiencies were found. The electro-mechanical actuators were handicapped because of the great power output requirements and the high speed with which the screens had to be moved (three seconds from one extreme position to the other). The prerequisites resulted in relatively heavy, cumbersome units, Kelly said. He added that override arrangements had to be provided. If one or more of the eight individual screen segments stuck, the remaining free units would have to operate, thereby making the electro-mechanical linkage relatively complicated.

The screen tended to impose serious operational restrictions on the engine, indicating that an improved screen element design was needed to permit greater air flow.

No doors were provided to block off the air flow to the engine in case it became desirable or necessary to shut it down during flight. (Blocking the air flow will keep the jet engine from "windmilling" exactly as feathering the propeller on a reciprocating type powerplant.)

Smith-Morris engineers corrected these difficulties.

► **Two-Power Hydraulic Actuator**—They developed a small, lightweight hydraulic operating mechanism which had the interesting feature of providing variable effort to move the screens. High power is required during approximately the first half of the screen's retraction cycle to break the unit free from ice which may be forming rapidly and starving the jet of air. During the second portion of the retraction cycle, a reduction in operating effort is desirable to prevent any entrapped debris

from being squeezed and damaging the screen or cowl.

The hydraulic actuators designed by Smith-Morris provided this two-power effort. During the first portion of the mechanism's travel, two concentric actuating pistons moved simultaneously. At about the halfway mark, the outer piston bottoms and hydraulic pressure was applied only to the inner piston. Reducing the area to which pressure was applied resulted in less effort being exerted on the screens, an effort calculated to be low enough to prevent damage by squeezing an obstructing piece of debris between screen and cowl.

Since each screen segment was provided with its own actuator, if one became stuck, the others could operate freely.

Added advantages of the hydraulic system according to Smith-Morris, were that it was smaller and lighter than the electro-mechanical counterpart, it developed sufficient power to retract the screens under full ram pressure, to break them loose even when fully iced over, yet due to the variable effort feature, did not damage the screens when they retracted with ice or other debris clinging to their surfaces.

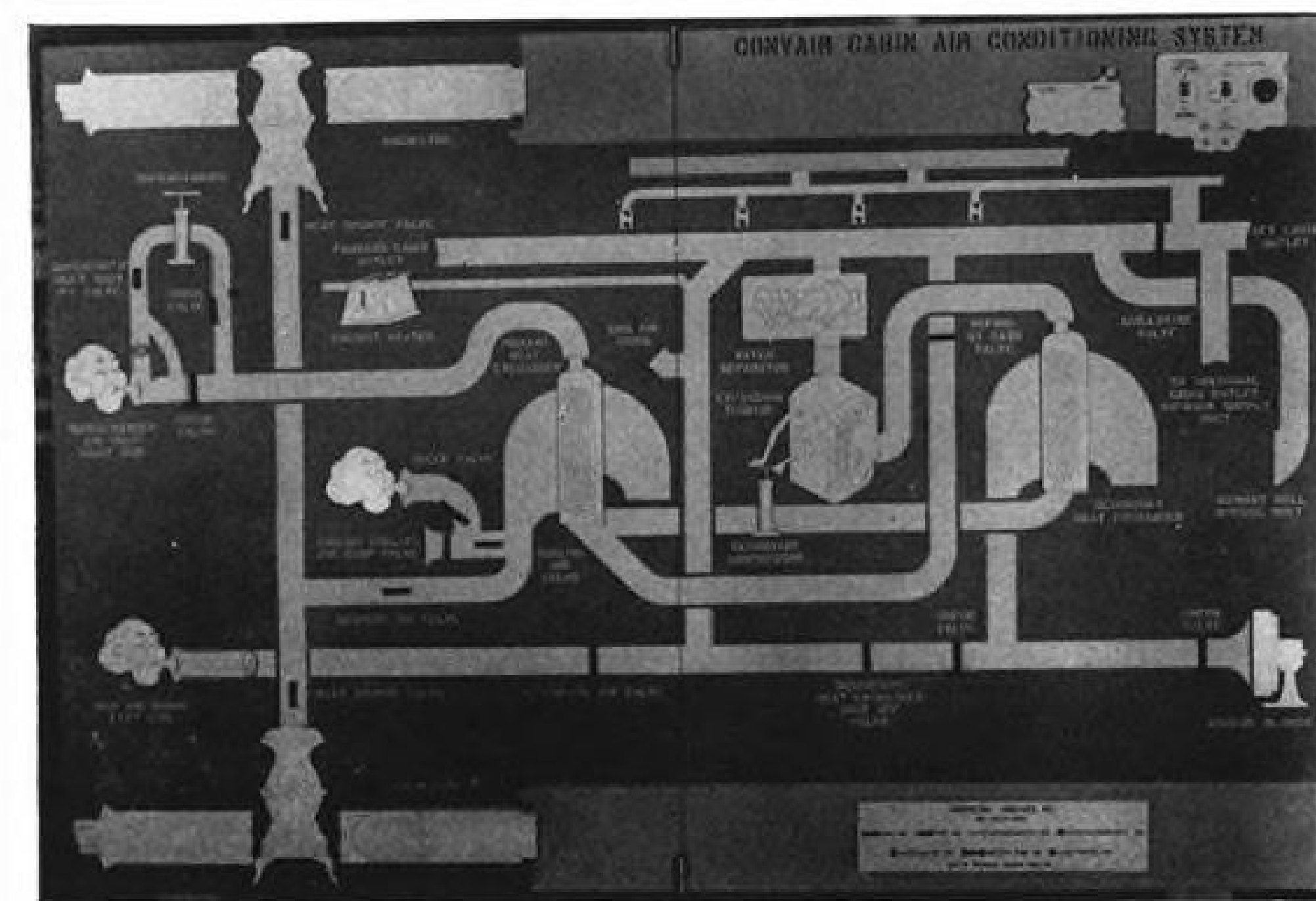
► **Duct Doors Added**—Since it was desirable to provide duct doors in the system to close off the airflow, Smith-Morris engineers designed a set into their subsequent models. The doors are normally retracted out of the way,

lying parallel to the surface of the cowl. They may be extended by actuating the appropriate control and will completely block off all air to the jet. An interlocking mechanism is provided which prohibits extension of the doors when the powerplant is operating, this to avoid inadvertent engine stoppage.

To increase air flow to the engine, new screen elements were designed. Instead of all elements being the same size and circular section tubes, the new units were streamlined section tubes. Also, in the new screens, alternate elements were made of tubing half the size of the adjacent pieces—this resulted in reduced pressure losses through the screen and improved impact resistance. If entering debris were sufficiently large, it would bridge the small elements and come into contact with the stronger, heavier units. The frame and elements are made from stainless steel.

► **Bright Future**—In experimental quantities, the screens cost about \$5000 per engine—this could be reduced by half if ordered in quantity. Weight of a unit for a 150 lb./sec. airflow jet engine is close to 90 lb.

Kelly is enthusiastic about the future potential of Smith-Morris' newest baby. Engineers agree that the axial-flow jet engine will see increasing use as the speed of jet aircraft goes up. And a majority, if not all axial jet engines will eventually be equipped with screens.



Telling the Girls How it Works

American Airlines has adopted this simple and graphic method to teach its stewardesses the intricacies of the aircraft in which they fly. Illustrated is the training aid used in AA's Stewardess school at Chicago Airport to in-

doctrinate the girls in the mysteries of the Convair 240 heating system. A similar panel exists for the heating system of the DC-6. It is manufactured by Technical Training Aids, Inc., to AA's specifications.



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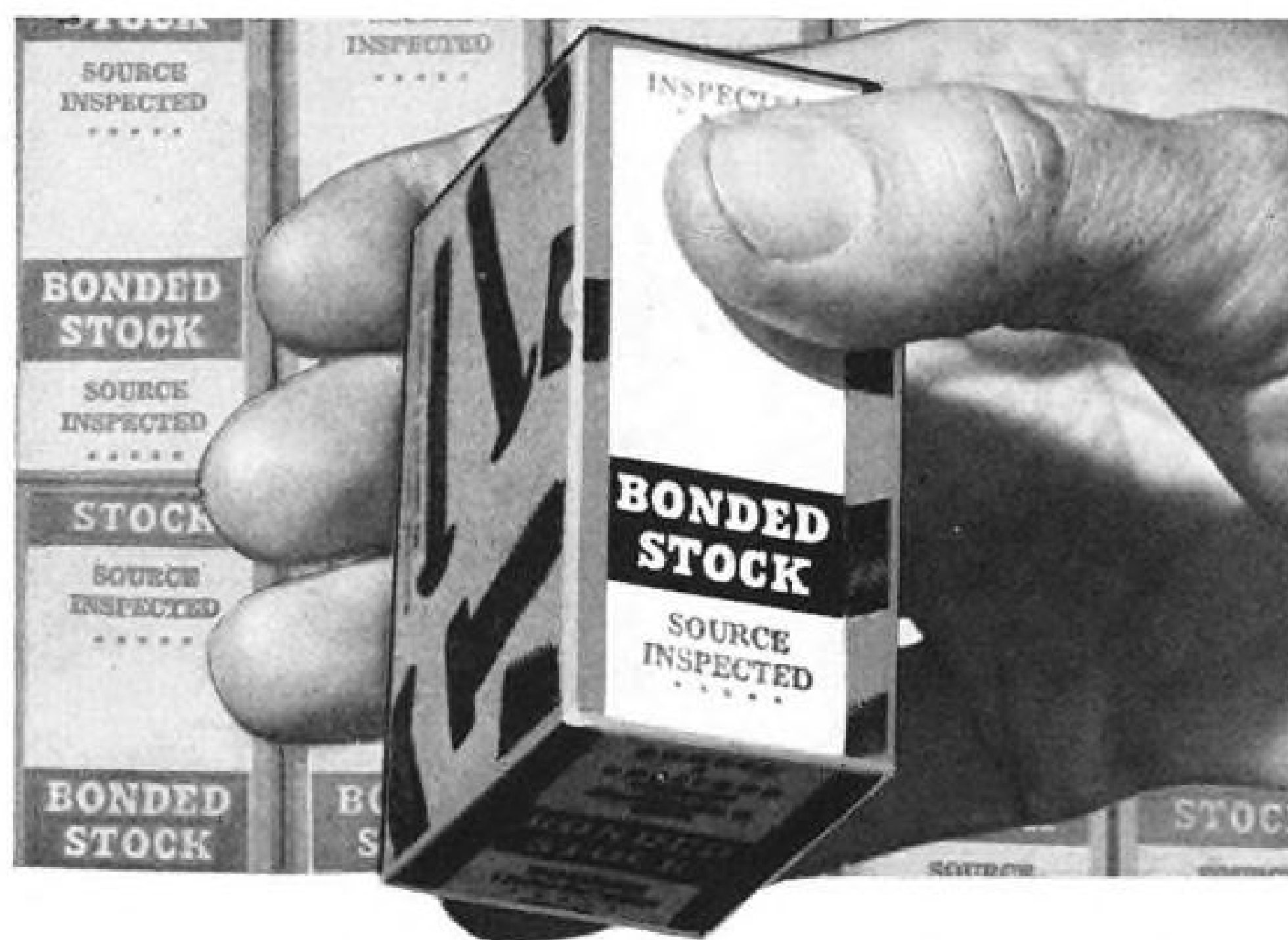
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Tough Flexible Joint

Chicago—"Flexoniflex," recently announced expansion joint, will withstand pressures up to 5500 psi. This is higher than any other expansion joint in existence, according to R. L. Nissen, advertising manager of Chicago Metal Hose Corp., Flexoniflex manufacturer.

Also capable of withstanding temperature extremes ranging from sub-zero to 1600 deg. F., and 250,000 flexing cycles, the expansion joint lends itself to innumerable applications in the guided missile, rocket propulsion and atomic development fields.

Flexoniflex joints are capable of absorbing radial and offset motion as well as axial motion. They derive ability to withstand high pressure from the fact that the pressure carrier is formed within retaining rings which are integral with the expansion joint; the rings are not removable.

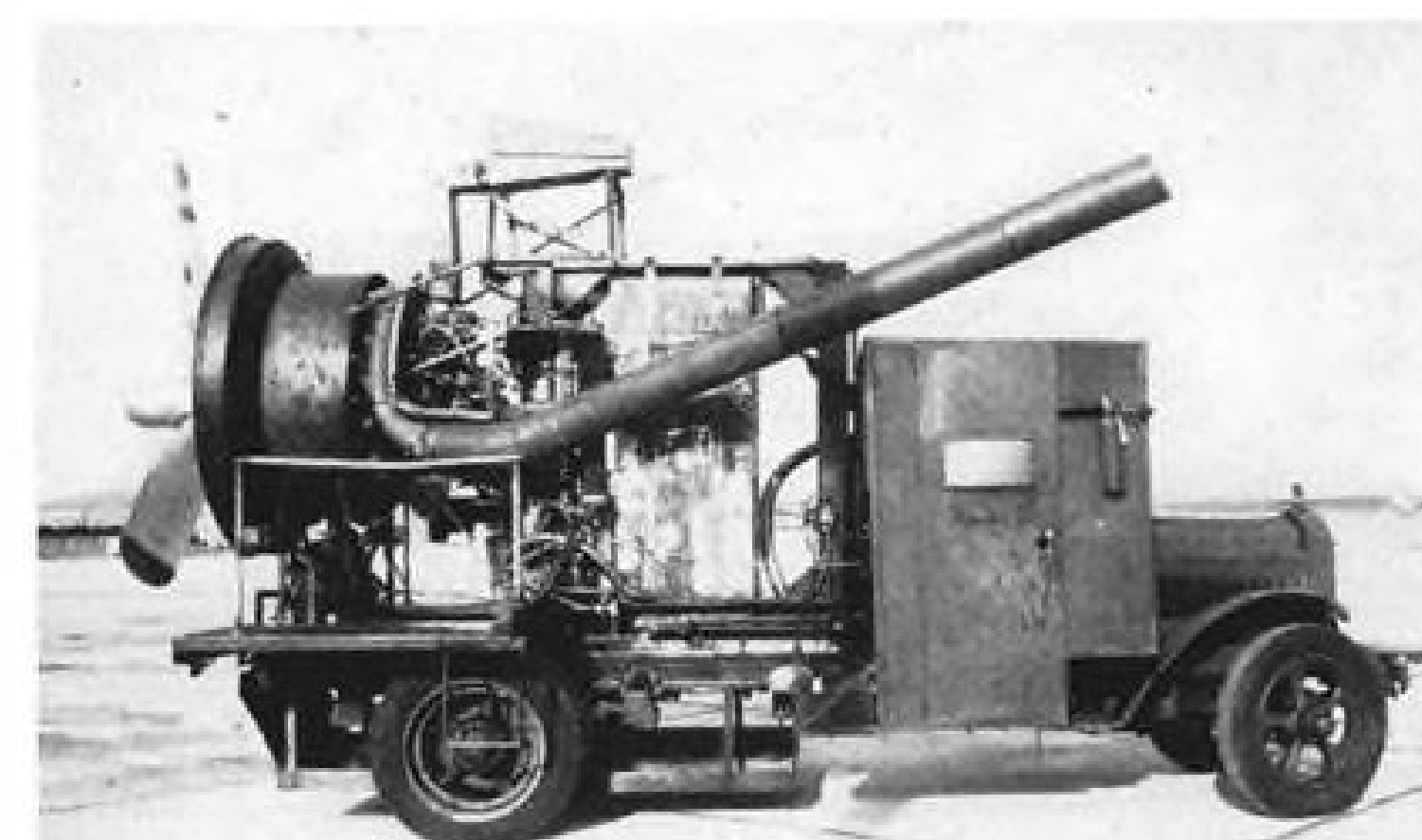
The company, whose plant is in Maywood, Ill. a suburb of Chicago, says that Flexoniflex is being used in many confidential applications where it is necessary to convey fluids or gases under high pressures between relatively moveable parts. It is available in sizes from 1/8 in. continuing through the range of extra high pressure pipe sizes.

Catches Battery Waste

The job of cleaning battery wells on aircraft is no longer the chore it used to be for maintenance crews in the Latin-American division of Pan American World Airways.

The carrier has devised a tank which fastens under the aircraft to catch all the waste which ordinarily would drip on the hangar floor and soil parts of the plane. The tank permits the cleaner to be sprayed under pressure into battery compartment. Dirty fluid drains into tank through a flexible hose to second storage tank on the floor.

W. P. Driver, PAA's assistant superintendent of Douglas aircraft maintenance at Miami, says, "We now do this job in two or three hours, compared to six or more before this gadget was rigged up."



"Old Mack" (left) is still packing newly overhauled DC-3 engines for Continental. Newer but sturdier partner (right) handles larger R-2800s.

Continental's Mobile Test Stands Satisfy

Denver—"Old Mack," Continental Air Lines' venerable mobile engine test stand, has been given a new lease on life.

The \$25 truck still treks around Stapleton Field hauling the air line's newly built-up DC-3 engines during run-in. Continental has a special mechanic who "can coerce consistent co-operation" out of the stubborn old side winder.

In spite of its antiquity and "Jerry-built" appearance, the old truck has well earned its keep at Denver with Continental.

Old Mack was recently joined by a newer model helper to test Continental's Convair R-2800 engines. "Mack II" (right) is a snappier, more up-to-date type of a mobile engine test stand which started its existence as a Rocky Mountain sight seeing bus. (Trans-Canada Air Lines also uses an automotive engine test stand for its liquid-cooled Merlins, AVIATION WEEK Oct. 23).

In Mack II's cabin are a complete set of engine controls and instruments, while outside, in plain sight of the

run-up mechanic, are fuel and oil flow meters which show fuel consumption and rate of oil circulation in the engine being tested.

Considerable care has been taken to protect the newly overhauled engines from inhaling dust by including extensive filter installations in the carburetor intake ducts.

Continental has abandoned any idea of building a permanent testing building for the time being, the Mack twins, pictured above having proved so satisfactory.

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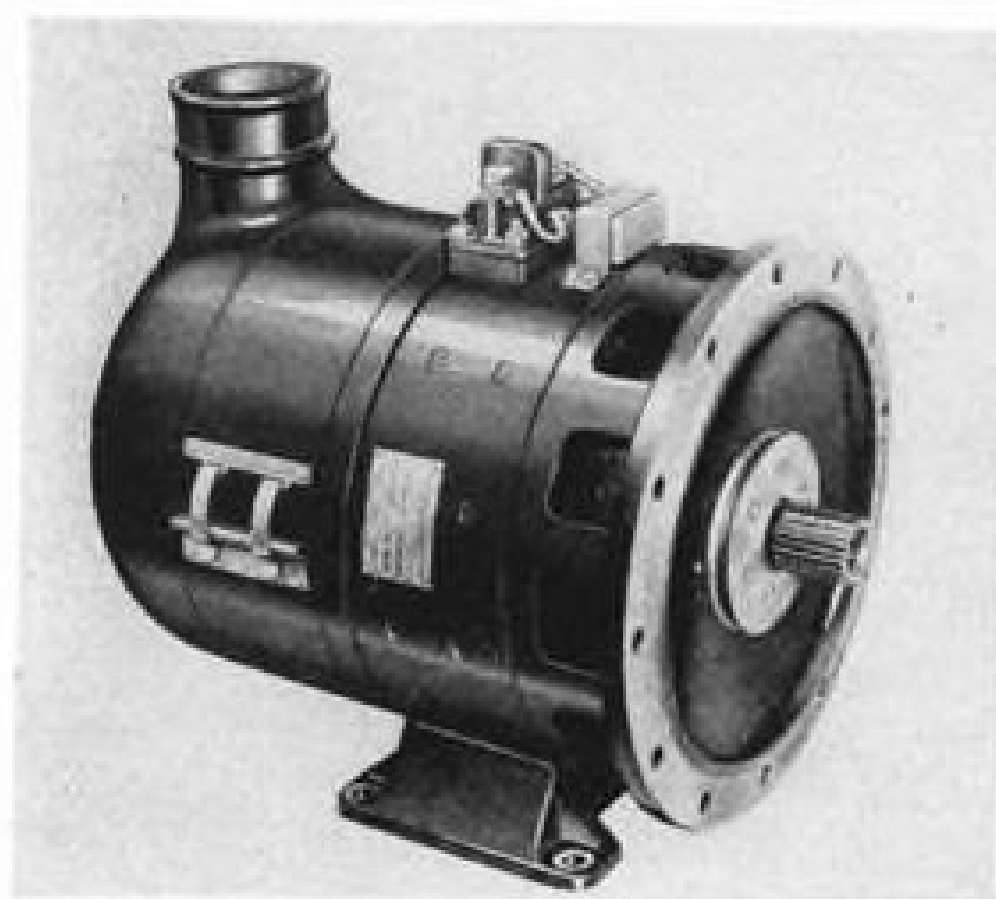
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NEW AVIATION PRODUCTS



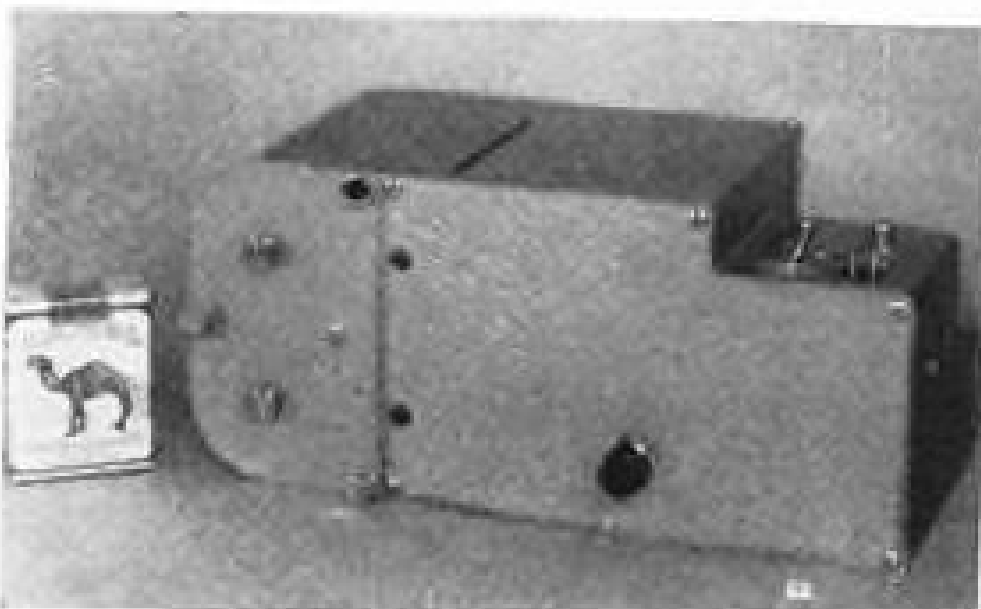
Starts Jet Engines

A lightweight generator, developed for ground power uses such as starting jet engines on aircraft, is being produced by Jack & Heintz Precision Industries, Inc., Cleveland 1, Ohio. The unit is designed to Navy specifications.

It is rated for a continuous output of 500 amps., 30 v. d.c., but can handle much larger intermittent loads, reaching 1000 amps. for limited periods. The generator operates through a speed of 4000-8000 rpm.

Designed with a flexible coupling, the drive quill is protected by a friction damper to eliminate dangerous stresses. A shear section, 4200 in. lb. maximum torque, is located between the drive spline and friction damper.

The new model is equipped with a mounting flange fitting a standard AND 20006 pad. Overall length from mounting flange is 13 in. and diameter is 9 3/4 in. Current model is air-blast cooled, while a self-cooled version is under development.



Airborne Recorder

A small oscillograph, designed for recording phenomena under adverse conditions in parachute ejection tests, guided missile studies and in similar airborne applications where space is limited, is being displayed on the equipment counter by Century Geophysical Corp.

The device is built to record data faithfully while withstanding accelerations up to 20 Gs. It weighs only 11 lb.,

including paper load, and measures 5 x 5 x 11 in. The unit has a calibrated dial control which permits instant selection of any paper speed from 2 to 12 in./sec. without changing gears or belts. Supply and takeup are combined in a single detachable, daylight loading unit that carries 50 ft. of paper or film 3 1/2 in. wide.

The unit will accommodate from 2 to 12 individual recording channels and is equipped with Century's Model 210 galvanometers. It operates on 24v. d.c. current.

Century also is marketing a larger airborne oscillograph, Model 408 (not shown), incorporating equipment not included in the smaller unit. It will carry 200 ft. paper or film 8 in. wide; weighs 51 lb. and measures 20 x 12 1/2 x 8 3/4 in. Address: 1333 N. Utica St., Tulsa, Okla.



For Small Airports

A fire truck tailored specifically to meet the needs of small airports has been developed by the Cardox Corp. It is designed around techniques tested and proven at military fields, the company says.

Primary extinguishing medium of the machine, Model MC-750, is low-pressure carbon dioxide which is contained in a refrigerated storage vessel of 750-lb. capacity. The CO₂ is maintained at a temperature of about 0 F. at the relatively low pressure of 300 psi.

At this temperature and pressure, the liquid carbon dioxide at release yields about 47 percent CO₂ snow for maximum cooling effect—compared with a yield of 24 percent if the extinguisher was stored at a temperature of 80 F.

Another advantage, according to Cardox, is that in remote areas where low pressure storage centers are difficult to reach, the truck can be recharged from high-pressure cylinders.

Two reels, each containing 150 ft. of 3/8-in. hose with a playpipe and squeeze valve, permit discharge of the CO₂ at the rate of 150 lb./min./nozzle. "Snow separation" nozzles achieve virtually complete separation of the CO₂ snow and vapor, so that the snow can be concentrated in one portion of the discharge, Cardox says. Also avail-

able are bayonet-type nozzles for piercing and flooding wing sections or other compartments and extra long playpipes, which can be built up quickly in sections, for reaching engines or other equipment.

The truck also carries 200-250 gal. of water and 20-25 gal. of air foam concentrate in separate tanks. Special discharge equipment is installed for these extinguishers.

The truck may find another important use around small airports and communities. It can be used as a mobile pumping station, since it is equipped with a 200-gpm. pump having a 3-in. suction inlet and two 1 1/2-in. discharge outlets with hose. Address: Bell Bldg., 307 N. Michigan Ave., Chicago 1, Ill.

ALSO ON THE MARKET

Vapor steam cleaning machines, in heavy-duty, portable or stationary models of 100 and 200 gal. capacity, have automatic controls and multi-attachment cleaning guns with steam shut-off switches, permitting one-man operation. Time-consuming adjustments and need for pre-mixing of cleaning compound are supposed to be eliminated. Made by Sterod Mfg. Co., 444 Frelinghuysen Ave., Newark 5, N. J.

Blind flying shield has blue plastic visor which covers face, permitting student to see instruments clearly, but preventing him from seeing outside of plane when shield is used in conjunction with an amber plastic covering on windshields. Distributed by Van Dusen Aircraft Supplies, 2004 Lyndale Ave., S. Minneapolis, Minn.

Lucite pickling baskets designed to last longer and cut pickling time, are resistant to acids and alkalis in addition to being transparent for watching baths in action. This type of equipment for electroplating and chemical processing is being adopted by a large number of firms, says the maker. Made by Singleton Co., 10516 Western Ave., Cleveland 11, Ohio.

"Scotch" brand masking tape, marketed for the first time, is cellophane-fibre type, No. 670, designed to protect Plexiglas from solvent cements. The masking tape has pressure-sensitive adhesive on the back.

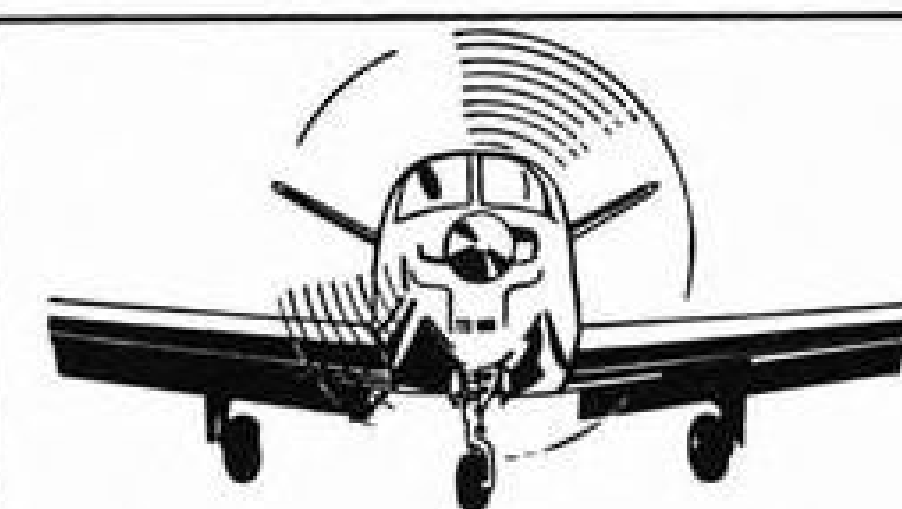
Also announced is acetate-fibre riveter's tape, No. 775, produced during World War II. Tape has pressure-sensitive adhesive on edges only and holds rivets in place during riveting operations. Made by Minnesota Mining and Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.



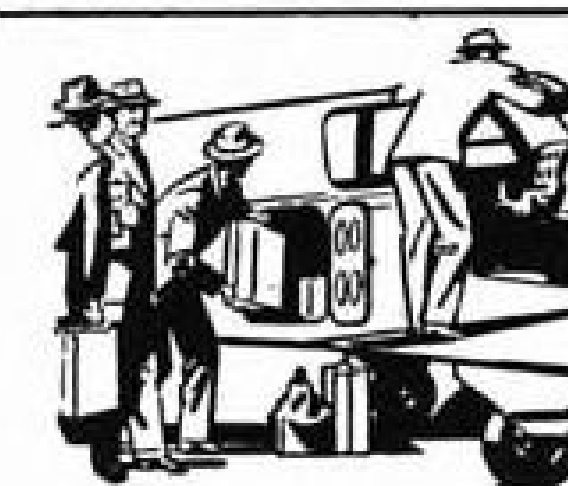
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Because it's designed to excel in not just one category but in *all* important ones, the Model B35 Beechcraft Bonanza is the leading seller in its class. Inspect it today at your Beechcraft distributor's or dealer's. Or write for full information on your company letterhead to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

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Cruising speed, 170 mph
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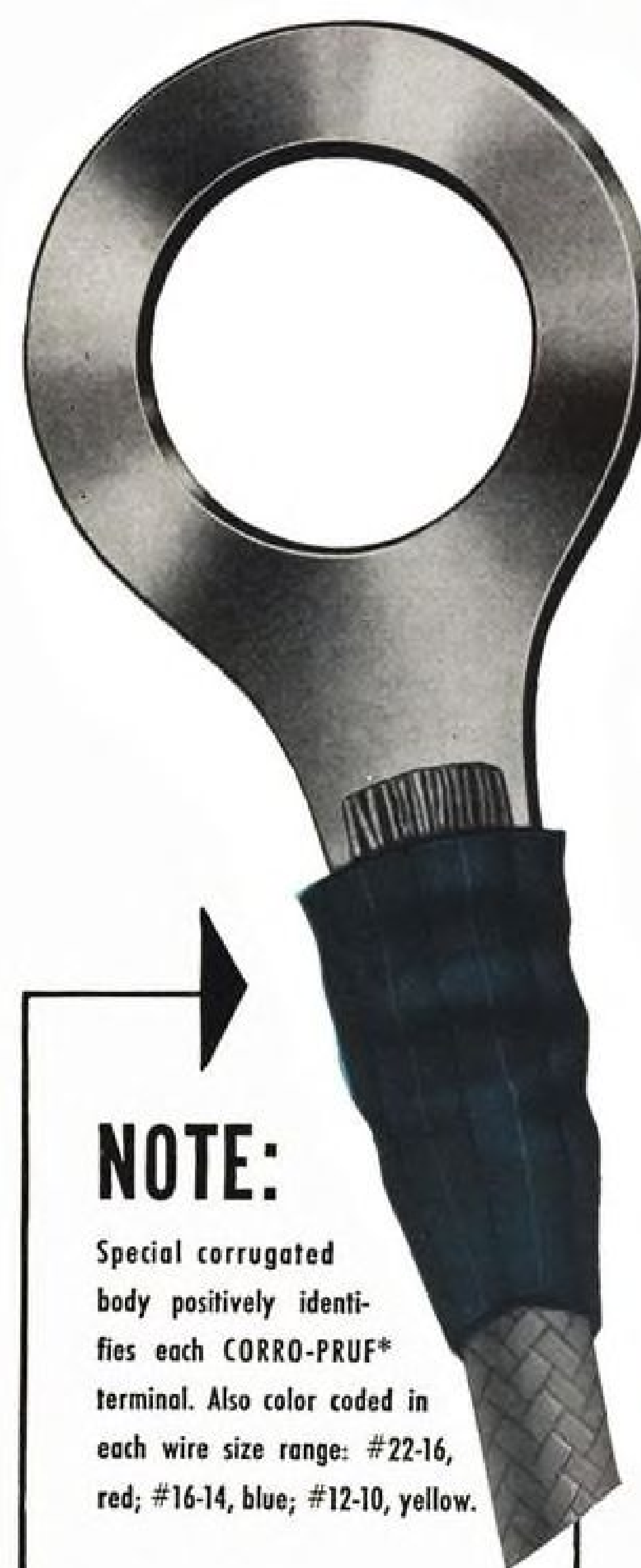


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The colorful insulating plastic jacket is already securely BONDED to each terminal barrel—cannot slip or be removed, complete installation is made with one stroke of a tool!

In addition, extra length barrel supports the wire near base of terminal—prevents sharp bending or fraying of insulation.

Send for AMP's new bulletin which describes the unusual resistance of CORRO-PRUF* terminals to noxious fumes, salt spray, acids, oil, grease, etc. Complete information is included about AUTOMATIC MACHINE installation for high speed mass production.

* Trade Mark



Extra value for the mass producer is offered in AMP's complete line of precision tools. Featured on the left is the latest model AMP Pneumatic Hand Tool. Automatic Machine (right) will produce up to 3300 completely insulated terminations per hour!



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IN THE AIR ...

You're always right

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AIRCRAFT WIRE AND CABLE



You are invited to write for our informative catalog.

If it's quality you're after—if its quantity you want—if it's a special specification you need, Auto-Lite has the answer. In 39 years' experience, Auto-Lite research and advanced laboratory skills have assisted leading aircraft manufacturers in meeting difficult wire and cable problems. Today, the tremendous output of the new Hazleton plant, combined with the now increased facilities at the Auto-Lite Port Huron plant, makes it possible to accept additional aircraft wire and cable business. Money cannot buy better wire and cable.

THE ELECTRIC AUTO-LITE COMPANY
Wire and Cable Division
Port Huron, Michigan Hazleton, Pennsylvania



LOW TENSION

Aircraft Low Tension Cable Specification AN-JC-48a. Aircraft Low Tension Cable shielded Specification ANC-168.
Aircraft Low Tension Cable aluminum conductor Specification ANC-161.

HIGH TENSION

Aircraft High Tension Ignition Cable sizes 5MM, 7MM and 9MM Specification ANC-130a, also to commercial standards. Magnet wire to Specification JAN-W-583 and commercial standards.

SALES & SERVICE

New Insurance

Plane and pilot rating plan favors those with good safety marks.

A system of scoring aircraft and pilots on their safety records to arrive at insurance rates for aircraft hull coverage has been developed by the American Mercury Insurance Co., consultants to the Aircraft Owners and Pilots Assn.

The merit-rating scheme, available exclusively to AOPA members, gives planes and pilots with the best safety records a better rate than those with less satisfactory marks. Thus Americo has gotten away from using as a calculation overall accident statistics, which could work as a handicap to safe flyers and planes.

►How it Works—According to G. C. Whalen, Americo president, AOPA members' planes in the future will be subjected to a check list procedure covering fixed "debits and credits," with each plane's score under the new system automatically determining the premium rate to be charged.

Credits allowed by the company include:

- pilot experience.
- fire resistant hangar where the plane is permanently stored.
- favorable geographic location.
- AOPA-approved stall-warning instrumentation.
- pilot's previous safety record, and occupation.
- average number of hours per year the plane is used.

Debits are scored against planes flown by students, seaplanes or amphibians, use of home airports not conforming with minimum CAA classification requirements, and for the difference between a plane's list price and its insured value.

Worms Are Turned By Aerial Dusters

Some 150 cropduster planes from 14 states flew an emergency mission recently to the "boothel" section of southeast Missouri to save its cotton crop from a sudden scourge of cotton leaf worms. The dusters came from as far away as New York, California and Florida.

Farmers met incoming pilots at the airports with cash in hand—pleading for first turn for their fields. Some operators covered as much as 1400 acres a day, flying dawn to dusk.

The worms turned Sept. 15, after a two-week aerial bombardment of spray and dust. Mobility of the aerial equipment undoubtedly saved a large and valuable cotton crop, CAA observers commented.

Plane Deal Approved

(McGraw-Hill World News)

Rio de Janeiro—Transfer of \$300,000 to the U. S. for payment covering purchase of American lightplanes to be used by Brazil's government-sponsored aero clubs has been approved by presidential signature. Most of the funds will go to cover training planes already ordered from Piper Aircraft.

BRIEFING FOR DEALERS AND DISTRIBUTORS

►Pilot Exam Changes?—CAA is considering major changes in knowledge, experience and skill requirements for private pilot certification. The agency is contemplating reinstatement of a written exam, increased cross-country training, and a new flight test.

►School Trades Hands—The 20-yr.-old

Metcalf Flying Service, Toledo, has been sold by Tom Metcalf to Harvey Mahrt and Ken Colthorpe, who will operate the school under the same name with expanded facilities. The new owners have signed a 17-yr. lease with the city at \$1600 per year plus three-cents on each gallon of aviation gas sold.

►September Shipments Down—Shipments of 187 four-place or more and 106 one- and two-place personal and executive planes during September by eleven builders marked a drop over the previous month when ten builders shipped 344 craft. Dollar value for September was also down from August: \$1,592,000 compared with \$2,027,000. Cessna was by far the biggest shipper, with 101 planes.

►No More Ercoupes in '50—The military situation and the backlog now held by Engineering & Research Corp., Ercoupe makers, are two reasons given by distributor Sanders Aviation as preventing further production of the two-placer this year. The Ercoupe production line has been removed to make room for military work. Sanders states there are enough spare parts.

►Piedmont Adds New Base—A full-scale aircraft sales and service operation and wholesale plane parts distribution center is being set up at Norfolk Municipal Airport, Norfolk, Va., by Piedmont Aviation, Inc., Winston-Salem, N. C.



COMMERCIALS FROM ON HIGH

A method of delivering commercial broadcasts from the air has been worked out by Max Goldstein enabling him to give full attention to piloting while handling his assignment. Goldstein has developed a needle arm on the record player which will not jump out of the record groove because of vibration or motion of the plane. The player

operates from a 12v. battery and has a 150w. capacity. The speaker, mounted beneath the fuselage, has six driver units of 25w. each, and has an audible range of over two miles from 1000-ft. altitude. The complete unit weighs only 160 lb. and costs less than \$500 using some war-surplus parts. A hand mike is fitted for spot announcements.

FINANCIAL

Airline Credit Is on the Upswing

Carriers' good standing is indicated by interest on EAL's \$30-million loan; rate is same paid by GE.

Airline credit is currently well regarded as reflected by the terms surrounding the current bank loan arranged by Eastern Air Lines.

Eastern received a \$30-million five-year bank credit from a group of 27 banks, headed by the Chase National Bank of New York. This entire amount will be available over a two-year period under revolving credit notes bearing interest at 2½ percent with a ¼ of 1 percent commitment fee applying to the unused balance. At the end of the two-year period, the amount of the loan outstanding at the time will be funded over three years at a 2½-percent interest rate with repayments scheduled in twelve equal quarterly installments.

The advantageous terms of this unsecured credit to an airline is evident when it is realized that prime corporate bank loans, such as to General Electric, for example, are made on a 2½-percent interest basis.

In recent years, there has been a tendency for interest rates to firm up over the levels existing previously. For example, in December, 1946, Eastern arranged a \$20-million unsecured bank credit. The maximum amount it drew under this arrangement, however, was \$16 million as of Dec. 31, 1948, made available at an interest rate of only 1½ percent. It is estimated that Eastern currently owes \$6,666,667 under this earlier bank agreement with quarterly payments of \$1,333,333 scheduled up to Jan. 2, 1952, the liquidation date.

► **New Equipment Program**—The current \$30-million credit will be applied to finance Eastern's \$40-million new equipment program consisting of the purchase of 35 Martin 4-0-4s and 14 Lockheed Super-Constellations. As none of these aircraft will be delivered until late in 1951, it is unlikely that the company will draw down much of its new credit until that time. It is possible, however, that Eastern, to offset paying the commitment fee for unused balances, may draw down considerable funds and invest them profitably in prime short-term marketable securities. It did this, to a degree, under its earlier bank credit.

Bank credits are playing an increasing role in financing equipment purchases. • **United Air Lines**, in its February, 1947 financing, was able to arrange a \$28-million revolving bank credit at an

interest rate of only 1½ percent. On July 1, 1948, as provided in the agreement, the entire outstanding credit in the amount of \$28 million was funded on a five-year basis at a 2 percent interest rate payable in 20 equal consecutive quarterly installments. Under this schedule the bank loan will be completely retired by July 1, 1953.

• **Delta** obtained a \$5-million bank credit on Nov. 16, 1946, which was funded on a 2½-percent interest basis due in equal quarterly payments of \$250,000 from Nov. 5, 1948. As of June 30, 1950, Delta owed a total of \$2,925,000 under this loan agreement.

• **Braniff** resorted to a \$6-million bank credit on Jan. 30, 1947, to finance its equipment acquisition program. This loan was funded on Dec. 31, 1947, with payments scheduled over 22 equal quarterly installments, starting Sept. 30, 1948. The interest rate in this instance was 2½ percent. As certain aircraft were sold, this loan was reduced by the proceeds of such sales with the consequent reduction in the pro rata installments scheduled. As of Aug. 31, 1950, Braniff owed \$3,613,585 under this pact.

• **Western**, unable to obtain normal banking accommodations, was forced to seek aid from the Reconstruction Finance Corp. During 1947 and 1948, Western obtained a total of \$6,421,605 in RFC loans at an interest rate of 4 percent. Moreover, this obligation is secured by virtually all of Western's assets and entails a number of restrictive conditions in the company's financial operations. As of June 30, 1950, this indebtedness has been reduced to \$3,092,757. As the credit of the carrier improves, it could possibly refund this government loan through bank credits at a somewhat lower interest rate.

• **Northwest**, unable to obtain needed funds from banks on its own credit standing, obtained financial assistance through the now controversial RFC-guaranteed loan. Under this arrangement, out of a total \$21-million credit, the RFC guaranteed the banks against loss to the extent of \$12 million. As of June 30, 1950, a total of \$19,710,363 of this loan was outstanding. The interest cost in this instance is 4 percent to Northwest. Here, too, the carrier has pledged most of its assets and is bound by various restrictive provisions.

Its government obligation is currently

proving awkward in view of Northwest's recent action in paying \$325,000 in deferred and current dividends on its preference shares. Faced with a reduction in mail pay, this dividend action may lead to further inquiries by a Senate group looking into RFC loans.

► **A Capital Deal**—Probably the best financing deal in recent times, arranged by an airline to acquire equipment, goes to Capital Airlines.

In acquiring a total of five used Constellations from Lockheed Aircraft Corp., Capital effected a novel purchase arrangement. As this Lockheed equipment has been received, Capital has signed promissory notes payable to the aircraft company representing the balance of the purchase price due on these planes. These notes are non-interest bearing and are payable in monthly installments over a period of 31 to 35 months beginning with the first day of the second month following dates of delivery. These notes are secured by a chattel mortgage on the equipment.

At the time this deal was made, Lockheed evidently was anxious to facilitate matters, as the disposition of the Constellations now owned by Capital led to the sale of new planes to a foreign carrier. No bank can possibly improve on the terms of this deal.

TWA, scheduled to take delivery of 40 Martin 4-0-4s and six more Lockheed Constellation starting next year, is believed to have worked out the details of a chattel mortgage arrangement to finance these purchases. Premised on previous agreements of a similar nature, TWA may make a down payment of about 25 percent. The banks would finance the balance with amortization payments over a period of years.

For example, in purchasing 20 Lockheed 749A Constellations last year—with deliveries starting Apr. 30, 1950 and scheduled for completion by January, 1951—TWA made advance payments of \$8 million toward this acquisition. Up to a maximum of \$12 million was made available by a group of seven banks at an interest rate of 3 percent. The TWA financing was accomplished after certain restrictive features of indentures securing the debentures held by the Equitable Life Assurance Society were modified.

Bank loans are expected to be employed in facilitating projected aircraft acquisition programs by Pan American, Chicago & Southern and Mid-Continent.

Major purchases of aircraft scheduled for 1951 delivery for American and United have already been provided for without need of additional borrowing.

With airline credit improving, banking accommodations to finance aircraft purchases for the permanently certificated air carriers appears now to be readily available.

—Selig Altschul

THIS MAN WOULDN'T NEGLECT

A MACHINE IN HIS PLANT

...yet he hasn't
had a Chest
X-Ray!



He checks every piece of mechanical equipment he owns for wear, lubrication, efficiency.

Yet he fails to take the simple precaution of a Chest X-Ray to make sure he does not have tuberculosis. *Not because he's opposed to the X-Ray. Simply because he is not sufficiently informed—or just hasn't taken the time and trouble, or does not realize the seriousness of the problem.*

A Chest X-Ray is the first step toward detecting tuberculosis in its early stages. And in its early stages it can be cured with the least loss of time from work.

So, if you're the man above, that one simple reason should make you get your Chest X-Ray—*today*. But listen, see how serious this really is:

Between the ages of 15 and 34, tuberculosis leads all other diseases as a cause of death—although at no age are you safe from TB. Yet, if everyone does his part by getting a Chest X-Ray periodically, and the majority of cases thus discovered are followed up, we can eliminate TB entirely as a public health hazard!

Will you do your part today? Get a Chest X-Ray. It may mean your life!

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McGRAW-HILL PUBLICATIONS

AIR TRANSPORT

Trunkline Traffic Rise

	Sept. Passenger Miles			Sept. Revenue Ton Miles		
	1950	1949	Percent Change	1950	1949	Percent Change
American	166,179	142,960	+16	20,860,740	17,849,444	+17
Eastern	95,475	78,805	+21	10,944,746	9,336,559	+17
Braniff	18,867	18,251	+3	2,196,686	2,196,686	+0
Capital	41,845	35,919	+17	5,050,348	4,442,592	+14
Delta	33,386	16,383	+103	2,734,752	1,908,543	+43
Northwest	53,298	47,131	+13	6,188,026	5,298,161	+17
Western	18,975	13,454	+41	1,998,221	1,368,334	+46
Colonial	5,242	5,449	-4	541,775	563,600	-4
Continental	6,753	6,562	+3	716,832	688,473	+4
Inland	3,538	3,245	+9	372,679	338,160	+10
Northeast	6,989	6,451	+8	693,826	625,270	+11
January-August Totals						
All trunklines	5,079,466	4,398,327	+15	613,283,966	528,137,750	+16

Business Good and Getting Better

Whatever the cause—defense mobilization or normal growth—the airlines are way ahead of last year.

Passengers and cargo are moving over the nation's air trunklines in record volume. October reports show strong improvements over 1949, both passenger and cargo. And indications are that November traffic will continue to show big gains over last year.

September gains averaged 15-20 percent. This is more of an improvement over 1949 than 1950's first eight months, which averaged 15 percent better than last year.

► **Business Is Good**—Here are some comments from airlines in reply to AVIATION WEEK's question "How's business?"

• **United Air Lines** says last month was "the best October on record, both passenger miles and cargo ton miles, and this month looks like an even better November."

• **National Airlines** says "Florida traffic will exceed all previous years." That's

based on hotel bookings, as well as other indications. October figures "indicate a record or near-record traffic month for the early fall season. Load factor was up 50 percent" (from 45 percent a year ago). Passenger miles of 19,400,000 were up 34 percent over the same month of 1949. This was with an increase of only 1.5 percent in revenue miles operated and an increase in available seat miles of only 19 percent.

• **Capital Airlines** says November traffic keeps booming, especially through war-stimulated Washington. October passenger miles of the system were up 27 percent over a year ago to 43,391,000. That's a contra-seasonal increase over September.

• **Eastern Air Lines** says traffic is very good. Washington volume broke all records in October.

• **American Airlines** says the same thing. Estimates show October was at least "as

good as June, the best month in history." All types of traffic are up sharply over last year. And Washington traffic in October was 30 percent over a year ago. American's schedule completion factor was over 99 percent for the system in October.

• **Trans World Airlines** says "October was an outstanding month—and the best October ever."

► **Earnings Rise Faster**—Earnings are going up more than traffic, as load factors improve. For example, United Air Lines made the best income record for any quarter in its history the third quarter of this year, with a net profit of \$4,234,296 after all taxes. Cost per revenue mile was down 7 percent on traffic increase of over 15 percent.

Average domestic trunkline revenues the first half of this year were up 7 percent and operating income rose 30 percent, to \$13,559,000. Then July revenues of \$46,335,000, a 12 percent gain over 1949, brought a 46 percent increase in operating income—\$6,952,000. August revenue gain of 19 percent to \$48,310,000 yielded a 131 percent gain in operating income over last year. The \$8,851,000 operating profit of August was more than double a year ago, on a revenue gain of 19 percent.

But when average load factors push above 65 percent, the airlines run into scheduling problems. Popular daytime flights are filled to capacity. That's what has added emphasis to the big demand for new equipment this fall.

Average load factors for the Big Four—American, Eastern, TWA, and United—increased rapidly this summer, from 63 percent for the first half, to 69 percent in July, to 72 percent in August.

► **Artificial Boom?**—First question airlines must answer now is: How much of this traffic increase is normal growth, and how much is owing to Korea war and general defense mobilization activity?

The airlines seem to put their faith in continued growth of their traffic markets—passenger and cargo. U. S. scheduled airlines have already ordered

148 new multi-engine planes for delivery next year. They will pay part of the \$127-million cost out of currently improved earnings. But a large share of the money must be borrowed, or taken out of working capital. This shows faith in the future revenues and profits.

One way to guess how much of the traffic gain is not artificial is to look at 1950 pre-Korea months, January through June. The trunklines had total revenue of \$240,037,000 the first half—7 percent over last year. Third-quarter revenue gain runs close to 15 percent or more over last year. The third quarter was a war mobilization quarter, with some added traffic surely coming from war-industry executive travel, war-influenced family travel, and war-and-scarcity-influenced air cargo traffic. Just as important as the direct influence of mobilization on travel is the high national income, partly also a result of mobilization.

But a conservative estimate might

still place this fall's normal traffic growth as 7 percent, which is the 1950 pre-Korea average improvement over 1949. But even here, it must be remembered that the first half of this year saw an industry boom, generally speaking, while the first half of 1949 saw a minor business recession.

Many observers, including some Civil Aeronautics Board economics bureau people, nevertheless say they think almost all this fall's heavy traffic has been normal—mainly dependent on good income plus regular airline travel growth.

Air Transport Assn. economic research department estimates total domestic trunkline passenger miles may come close to 7.8 billion when the year is out. That is 19 percent higher than last year.

Original ATA estimate made before outbreak of the Korea war was a 1950 total of 7.3 billion passenger miles. The revised estimate assumes average weather conditions and no rash of fatal crashes.

Airport Construction Program

Fiscal year	Federal contribution (000,000 omitted)	State-local sponsor expenditure (000,000 omitted)
1947	\$33.9	\$37.7
1948	32.8	32.5
1949	35.1	38.7
1950	27.5	37.4
1951	21.2	23.0

Where Federal-Aid Cash Will Go

Civil Aeronautics Administrator Donald Nyrop has announced how CAA will dole out \$24,638,910 federal funds to states and territories for fiscal 1951 construction and lighting at 186 airports.

State and local authorities are matching the CAA contribution with \$26,184,708 of their own. That brings the total 1951 federal-aid airport construction and lighting program to \$51,023,618.

Of the federal money, \$3.5 million is unspent money carried over from 1950, and \$21.2 million is new cash and contract authority.

The final 1951 federal grant of \$24.8 million is just \$15.5 million less than CAA Director of Airports Phillips Moore and Chief of Airports Planning Division Paul Stafford had asked for, before the Budget Bureau slashed their requests almost in half.

► **Construction Plans**—Here are construction and lighting plans of some of the 186 airports for fiscal 1951 (federal plus local funds):

• **Boston**, General E. L. Logan—\$1,500,000.

• **Chicago**, O'Hare Field—\$1,200,000.
• **Cleveland** Municipal—\$1,100,000.
• **Denver**, Stapleton Airfield—\$1,107,400.



COMMANDO TACTICS

A trio of Cessna 140s are being fitted into a Curtiss C-46 Commando of Lyon Air, Santiago, Chile, at Wichita, Kan., for delivery to Santiago. The same plane flew nine

race horses from Chile to Caracas, Venezuela, on its trip up. Another C-46 picked up other Cessnas that had been flown to Miami and transported them to Argentina.



ALL FOR ONE AT LANSING

Combined airlift of seven planes provided by four airlines totes 350 Oldsmobile dealers to tour company's Lansing, Mich., plants

and return to Chicago the same day. Shown at Lansing's Capital City Airport are five of the chartered planes—Capital DC-4,

Northwest 2-0-2, American DC-6, United DC-4 and United DC-6. An outstanding example of building dealer goodwill.

this year, left as "discretionary" funds. These it allocates to the chiefs of the seven CAA Regional Airport Divisions. This allocation is based on the airport construction needs of each region.

The regional chiefs in the field are closest to the planning problems of their airports, and so have most of the authority for distributing the \$5 million. **►Trend Down**—Until last year, federal aid for airports was coming in at the rate of over \$30 million a year. Then last year (fiscal 1950) it dropped down to \$27.5 million. This year it is \$21 million.

The sponsors lower their targets as the federal aid falls, so they generally end up putting in about the same amount as the federal.

Radar Control

LaGuardia test operation expected to show faster handling of traffic.

Airlines should soon be able to schedule over 25 percent more flights per hour than ever before through heavy-traffic airports like LaGuardia.

Radar control operators at LaGuardia Tower start clearing and directing takeoffs continuously for the first time on regular domestic traffic on Nov. 15. This is after gaining final assent by Air Line Pilots Assn. for "test operation."

Civil Aeronautics Administration Traffic Control Chief Clifford P. Burton is confident the system will quickly prove its merit and get full ALPA backing. It worked well on the Berlin Airlift operated by Air Force controllers. And a month ago it got an 8-hour test at LaGuardia during daylight. At no time during the test was there indication of a conflict—such as planes crossing too near each other in altitude after takeoff, or following each other too closely on similar courses.

►Equipment Simple—The equipment making this system possible is simple. It is a repeater surveillance scope added to the existing airport surveillance radar set (GCA). Formerly, there was only one surveillance scope in the tower.

A single operator could watch and control either the landing pattern or the takeoff pattern. But he could not effectively control both, so he kept his eye on landing control only.

Now two separate surveillance scopes will give the same 360-degree traffic picture within the terminal area. This enables a second operator to monitor all planes taking off and squaring away on their outbound routes through the 20-30-mi. terminal area.

►Three-Minute Interval—The radar-monitored takeoff control will allow

takeoffs at three-minute intervals under instrument conditions. Previously, the interval ranged up to an average of 10 minutes between planes, depending on whether successive planes were going on same or different routes and speeds after takeoff. Average takeoff interval permitted got as low as 6 planes an hour—and bad weather could mean delays and crowding on taxi strips and loading mats.

The new system permits 20 takeoffs an hour. And it goes a long way toward guaranteeing such a schedule. CAA expects to achieve a practical rate of 36 flights an hour through LaGuardia. Theoretical rate is 40 flights—20 takeoffs and 20 landings.

The slow takeoff schedule that was necessary without this control indirectly limited landing schedules, too. Landing capacity of a field might have been 20 flights an hour. But with less than 15 takeoffs permitted, the landing schedule had to be limited to less than 15 an hour, too. Otherwise, more planes would come in than went out—an impossible situation if it lasts long.

►Future Use—If the LaGuardia operation proves it can handle a 3-minute interval, LaGuardia's present dilemma—too much traffic—will be helped for the present. A 36-40 flight-an hour rate of handling will take care of present demand there.

Chicago, too, will stand to gain. Chicago can already land planes at intervals as low as 2½ minutes.

Bringing down the takeoff interval

will greatly help overall scheduling frequency, as well as reliability and safety of operation.

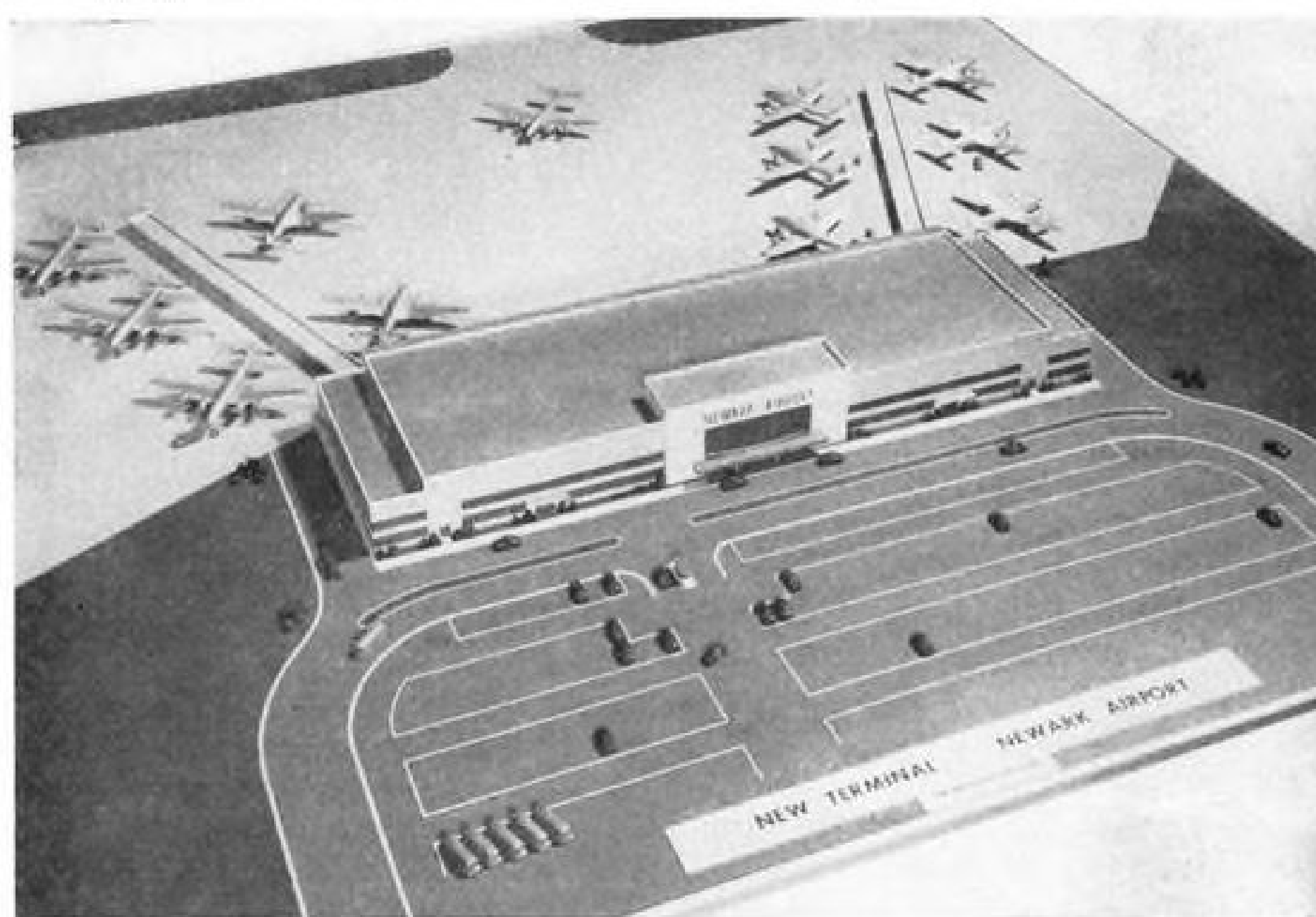
►Availability—CAA has only two repeater scopes now—both loaned by the Navy. CAA is asking the Navy to extend the loan until it gets delivery on its own scopes.

Gilfillan Bros. is making up eight ASR-1 repeater scopes for delivery to CAA by February. Gilfillan is assembling them from spare parts components that CAA had procured to maintain its installed surveillance gear.

Airports getting these first repeater scopes are Boston, LaGuardia, Idlewild, Washington, Atlanta, Chicago. Washington will get one as soon as the new tower is ready—probably January. Cleveland and Los Angeles towers lack the space to take an additional scope and operator.

CAA has 19 more repeater scopes on order from Bendix. Eight of these will go into air route traffic control centers, which feed traffic into the terminal areas.

Chicago got the second Navy-loaned scope early this year. The operator used it as a spot check, coordinating departures with the landings controlled by the surveillance operator. This monitoring operation was not a control of takeoffs. Chicago's traffic problem is very simple, with parallel runways and no other large airport nearby to confuse traffic management. The first control operation will be at CAA's thorniest spot—LaGuardia.



NEW TERMINAL BUILDING FOR NEWARK

Scale model of new enlarged terminal building facilities to be built by the Port of New York Authority at Newark Airport at a cost of \$6 million. New terminal building will have 5 times the floor space of the present terminal built in 1934. Measuring 600 x 170 ft. and covering 150,000 sq. ft., the new facility will be located on the northern

perimeter of the field. Two 500-ft. passenger-loading arcades are featured. There will be 16 gates, room for 22. Apron will be capable of handling planes up to 150,000-lb. gross weight. Visitors will be able to view field's activities from a 300-ft.-long glass-enclosed deck. Parking lot will hold 700-750 cars. Completion is scheduled in a year.

CAB Extends S&W, TAL Exemptions

Civil Aeronautics Board has exempted Transocean Air Lines and Seaboard & Western Airlines from provisions of the Civil Aeronautics Act so they may conduct regular operations under military contract.

Both of the two large irregular carriers are prohibited from operating regular commercial service.

The original exemptions of these two carriers have expired, but CAB holds that military demands make an extension to Apr. 28, 1951, necessary.

Air Traffic Growth

Scheduled airlines of the U. S. now have firm orders for 1951 delivery of 148 multi-engined planes worth \$127,000,000.

This figure comes from Air Transport Assn. Executive Vice President Robert Ramspeck, speaking before the American Society of Travel Agents.

Ramspeck says these orders are proof that airlines believe commercial air traffic will go on expanding indefinitely in the future.

Biggest new potential market the air-

Costs of LAA Copter Operation Dropping

Scheduled helicopter operations of Los Angeles Airways in September show costs of the experimental service are still going down after three years of operation. Total operating expense of \$1.22 per revenue mile in September is 8 percent under a year ago.

Main reason for the drop in costs is that direct maintenance of flight equipment—11 cents a mile—is half that of September 1949 (23 cents a mile.)

The 7,035,692 pound miles flown by LAA in September are up 11 percent from last year. Post Office-scheduled miles, 28,870, are slightly under last year's 29,050.

Performance factors show improvement, with 95.37 percent of scheduled miles flown this September, compared with 94.38 percent a year ago; 94.12 percent of scheduled trips were completed, compared with only 92.41 percent a year ago.

Fuel consumption in September is up to 0.52 gallons per mile from 0.50 in 1949, possibly because load carrier per mile is up.

NAA Updates Move To C-W Ohio Plant

Transfer of the Curtiss-Wright Corp. Columbus, Ohio, plant to North American Aviation Inc. will be effective Nov. 25, instead of next April as planned. Operations should start by Dec. 4.

It's likely that the earlier date was decided on to clear NAA's main plant at Los Angeles for concentration on F-86 Sabre production. The Columbus plant would be available to handle orders from North American Pact customers for Sabres and T-28 trainers. Orders for modernization of T-6G trainers can't be counted out either.

The period until operations begin in December will be taken up with inventory and hiring of Curtiss-Wright employees by North American.

J. L. Atwood, North American president, said his company expected to step up the Columbus operation to a considerably larger plant force than that now employed, but that increase in employment would be gradual. Some supervisory personnel will be transferred from Los Angeles to Columbus, to install North American operating methods.

The government-owned plant was built to be occupied by Curtiss-Wright eight years ago. Curtiss-Wright Hell-diver SB2C dive bombers were produced there for the Navy. The plant is still considered part of the Naval Industrial Reserve. The transfer involves transferring the Navy lease from Curtiss-Wright to North American.

HERE IS A NEW
ANGLE TO
LOOK AT...



Eight 6-ship Multi-T Buildings from International Steel bring revenue to the Miami Valley Flying Service at South Dayton Airport, Dayton, Ohio.

Since door openings are of the greatest importance in a hangar building, International engineers design doors to meet specific hangar requirements. For example, notice the exclusive Bi-fold Canopy door used on the International Multi-T hangar. Here, International eliminates all sticking, freezing, and wind or ice failure common to lightweight sliding doors. This same sound engineering thinking is carried through in the design of doors for large shop hangars.

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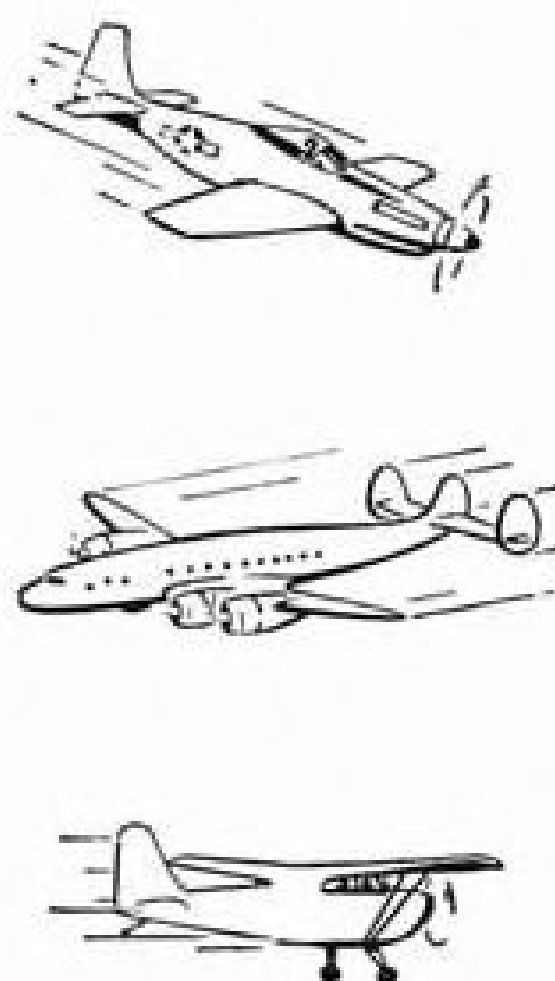


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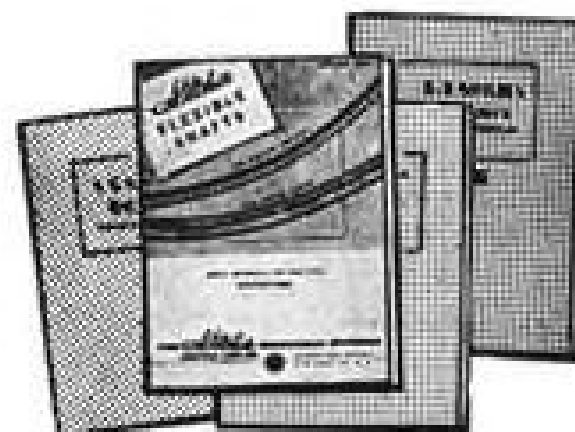


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lines are going after is the mass of people now getting an annual paid vacations of two to three weeks.

UN Group Sets Up Travel Research Unit

International air carriers may be the biggest gainers from traffic study and promotion to be started soon by a United Nations consultative body, the International Union of Official Travel Organizations (IUOTO).

IUOTO is setting up a group called the International Scientific Travel Research Institute to prepare for "development of new methods, new markets, and scientific analysis of facts relating to the (international travel) industry".

President of IUOTO, Dr. Herbert A. Wilkinson, says internationally noted economists will be named to serve on the Travel Research Institute.

Q&A Sessions With Boss in UAL News

"Why is American Airlines forging ahead of United Air Lines in passenger traffic and operating profit?" That is a United employee question put to United President W. A. Patterson in the line's house organ.

Patterson's answer: The two lines "differ in character of traffic and territory served. For example, American has an advantage in that it has a greater concentration of mileage in the eastern United States where inter-city travel is at highest density. Further, United has more seasonal travel and, therefore, our winter fluctuation is greater than American's. United's business fluctuates about 43 percent between the yearly high and low while American's fluctuation is about 29 percent.

"Still another factor in American's growth has been introduction of Convair planes which have made inroads on competitive north-south carriers using DC-3 equipment. For example, American has gained on the New York-Washington, Boston-New York and similar segments in competition with Eastern, Chicago & Southern, Braniff, and others."

► **Next Question**—The next employee question deals with United's DC-3 fleet.

"Could the advertising department put out some copy that would help sell the DC-3?"

Patterson's answer: "The DC-3 serves relatively small towns or cities where airports are not adequate for larger equipment. I don't think the cost of any concentrated advertising of the DC-3, beyond our present program in local areas, would bring results in proportion to the added expense."

► **United Equipment Orders**—United has a good-sized fleet on order with 20 DC-6Bs set for delivery next year and the year after. The cost of that order may prevent any modernization of its two-engine fleet for some time.

The company is converting seven DC-3s to carry 28 passengers instead of 21. But earlier thoughts about buying a substantial number of Super-DC-3s (perhaps 30) are now deferred. Cost of the 20 DC-6Bs will run around \$20 million.

The company plans to use DC-6s to replace DC-4s on passenger runs.

CAB Turns Down TTA Excursion Rates

Trans-Texas Airways cannot use its 4-cents-a-mile "excursion fare" proposed for its stub-end extensions in southern Texas, the Civil Aeronautics Board rules. The excursion fare is for a 30-day round trip limit. It is 27 percent lower than a regular roundtrip fare.

The Board says that Trans-Texas Airways is taking business from Braniff using an excursion fare that figures as low as 2.62 cents a mile over the circuitous route from San Antonio to Laredo. Fare on this run is \$17 for Braniff, \$13.50 for Trans-Texas "excursion." But, says the Board, the Trans-Texas fares are under investigation.

Implication of the Board's decision is that Trans-Texas will soon have to jack its excursion fare to 4½ cents a mile and limit the trip duration to three days.

And if Braniff files for a similar 4½ cent rate, instead of the CAB-denied 4-cent fare, Braniff will probably get it without having to go through hearings and Board decision.

► **Braniff Pitch**—Braniff filed for the lower fares because it has suffered a substantial passenger traffic decline on the so-called stub-ends of its route in southern Texas—Laredo, San Antonio, Corpus Christi, Brownsville, Houston and Galveston. For instance, average April 1950 load on the Houston-Galveston DC-3 run was 5 passengers.

Braniff attributes this low traffic to two reasons:

- Declining importance of Laredo and Brownsville as international gateways.
- Trans-Texas competition at lower fares.

Eastern Air Lines complained that the proposed fares were below cost, unjustified on basis of seasonal fluctuations, and ineffective in attracting sufficient new traffic to compensate for revenue loss per passenger. Eastern competes on the Brownsville, Corpus Christi and Houston segments.

SHORTLINES

► **Aer Lingus**—Irish Air Line plans to keep all its routes open this winter except the seasonal Jersey Island service. Among the company's services are six Dublin-London roundtrips weekly.

► **Air Coach Transport Assn.**—Group has opened a Washington office, headquarters for President Amos Heacock, who is fighting for the large irregular carriers. They are presently limited to three flights a month between any two major cities. Office is at Suite 316, Bond Bldg., Washington.

► **Air France**—Company departure station at Fifth Avenue, New York, has the first world-wide flight insurance-dispensing machine. Continental Casualty Co. policies cover passengers on Air France flights to any point on its network, and on any connecting carriers.

► **Alaska Airlines**—Alaskan network shows a profit of \$374,098 before depreciation for the 11 months to Sept. 30. Chairman of the Board Raymond Marshall predicts a better final showing for the fiscal year after mail pay adjustments. Last year the line lost \$1,322,565.

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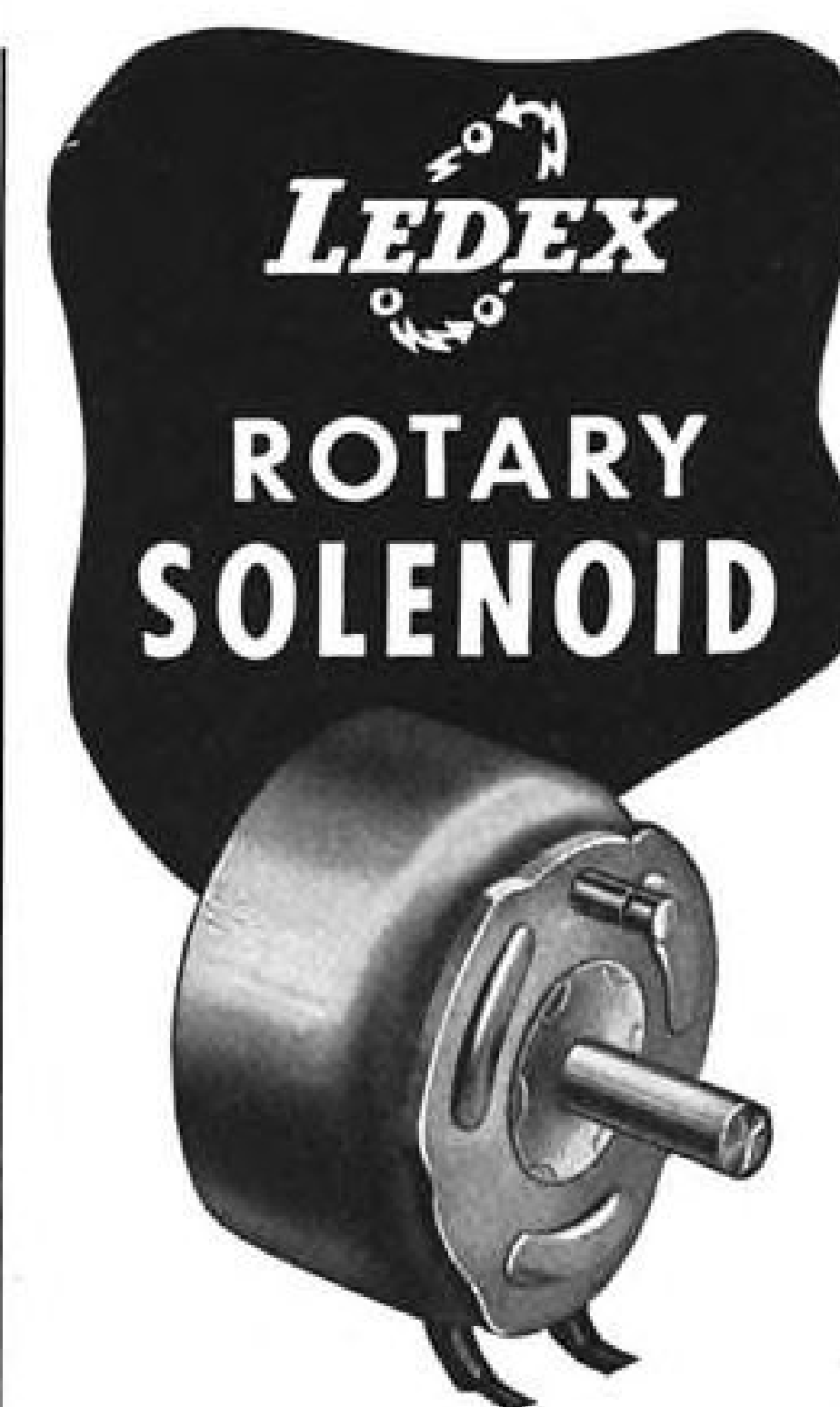
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► **American Airlines**—Company aircraft damage reports for September show plane injuries at "the irreducible minimum." But August was bad, says Safety Director R. W. Knight. Among August mishaps were: a wingtip damaged hitting a hangar as the plane was signaled ahead with insufficient clearance; two propellers damaged by a reckless baggage cart operator; aileron damaged by a messenger truck pulling away from a crowded plane without guidance; and a right stabilizer and elevator damaged by a truckdriver.

► **Braniff International Airways**—Company reports its international freight revenue in September was almost five times September, 1949.

► **British European Airways**—Carrier suffered its second major disaster in two weeks when a Viking overshoot the runway at London Airport on a night, radar-controlled instrument landing, killing 28 of the 30 persons aboard.

► **British Overseas Airways**—Company carried almost three times the traffic New York-London this September compared with last, flying 3678 passengers. Cargo traffic of 97,231 lb. was up 153 percent.

► **Capital Airlines**—Company believes the coach fare rise to 4½ cents a mile ordered by CAB will have no effect whatsoever on the continuing increase of coach travel.

► **Central Airlines**—Has started replacing 3-passenger Beech Bonanzas with 24-passenger DC-3s on all runs. Carrier expects to have converted the entire system by early next year.

► **Civil Aeronautics Board**—Administrator Donald Nyrop is starting a series of Washington tours of duty for CAA regional administrators "to improve Washington-field coordination."

► **Flying Tiger Line**—President Robert W. Prescott says air freight volume will multiply eight times over present-day traffic within the next five years. Rates will be less than two-thirds today's. He predicts military research will produce a plane with ton-mile efficiency twice that of current models.

► **National Airlines**—A new sea-air travel ticket agreement gives New York-Caribbean travelers round-trip privileges using Moore-McCormack steamship line one way and National and/or Royal Dutch Airlines the other way. . . . company's one-way coach fare of \$58 New York-Miami is suspended by CAB pending investigation, along with other proposed fares, rules and charges filed. Board says the fares may be too low, and may "prefer DC-6 coach fare passengers unduly, and may unduly prejudice DC-6 regular fare passengers."

► **Northwest Airlines**—Company has moved into new offices in the Hollywood-Roosevelt Hotel, Los Angeles.

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► **KLM Royal Dutch Airlines**—Will offer 15-day excursion fares January through March between New York and London or Prestwick. The new fare will save 103 pounds, 18 shillings on the normal return fare from London, or 88 pounds, 16 shillings on the fare from Prestwick.

► **Pan America World Airways**—Has put its improved scheduling and servicing plan into effect on Latin American flights, offering: addition of a third weekly extra-fare stratocruiser flight New York-Buenos Aires; nonstop service four times weekly New York-Caracas on Constellations; three flights weekly on "sleeperettes" New York-Sao Paulo; faster, one-stop service Miami-Caracas.

► **PanAmerican-Grace Airways**—Panagra says Argentina's president has issued a decree allowing Western Hemisphere citizens to enter his country without special visas, for a period not to exceed three months. Argentina follows five other South American countries in so removing tourist barriers. . . . company offers free a 24-page booklet previewing, in kodachrome, the scenes and airline services that await any Panagra tourist.

► **Piedmont Aviation**—Company has CAB permission to by-pass Lynchburg and Newport News when it flies more than three roundtrips daily between Cincinnati and Norfolk.

► **Pioneer Air Lines**—Feeder has CAB permission to continue service another year on the segment from Lubbock, Tex., to Albuquerque, N. M., via Santa Fe, Las Vegas, Tucumcari and Clovis, N. M.

► **South African Airways**—British Overseas Associated company has free rein in Natal Province, now the smaller indigenous Coast Aviation Co. has gone out of business, under pressure of SAA competition.

► **Sabena**—The Belgian line has put a DC-6 on its Brussels-Frankfurt-Munich lap Fridays because of increased traffic. This means Sabena U. S.-Germany passengers will ride DC-6s all the way. . . . company has inaugurated its first flight using Convair-Liners.

► **Scandinavian Airlines System**—Has started a weekly all-cargo service New York-United Kingdom-Germany-Scandinavia. It leaves Idlewild Saturday and makes Europe Monday morning.

► **Trans World Airline**—Now uses Constellations exclusively on all international passenger flights. New schedule offers 12 hr. 50 min. flight from New York to London, and less than 14 hr. New York-Paris.

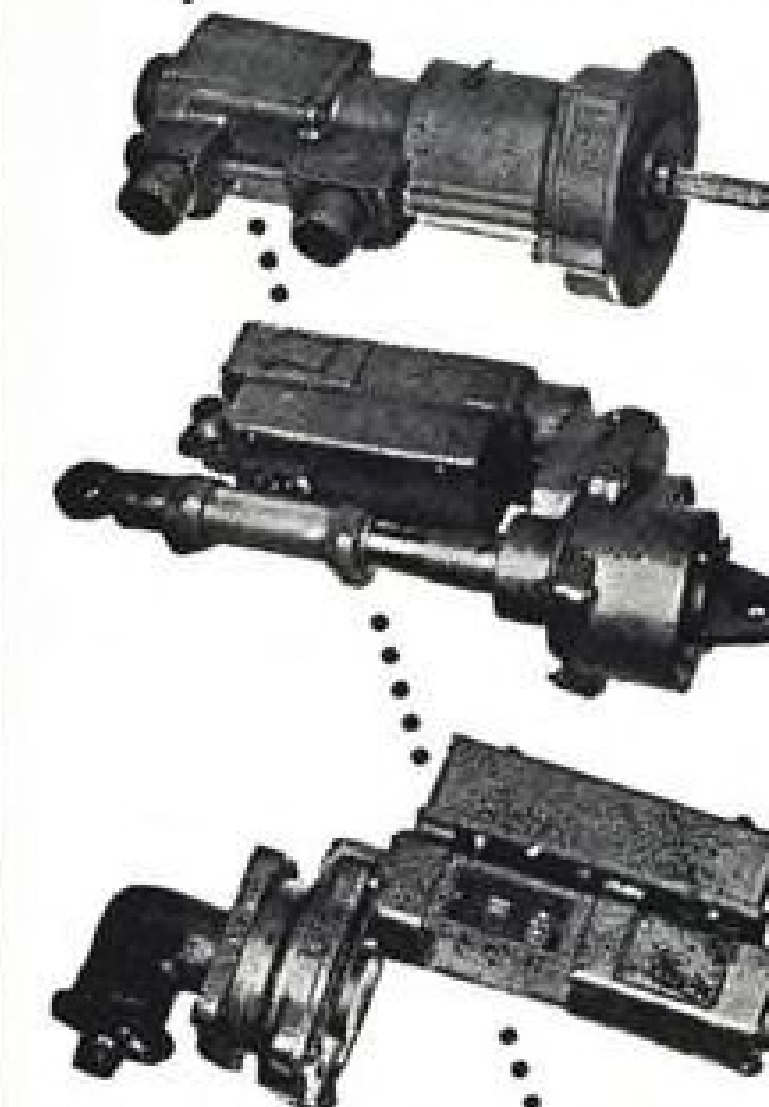
► **Western Air Lines**—Company has put out a miniature timetable—calling it the "Schedulette." It measures 1½ in. by 3¾, less than one-half the size of a folded wallet. It includes all flight and interline connection information, a national route map, and an index to service and equipment.

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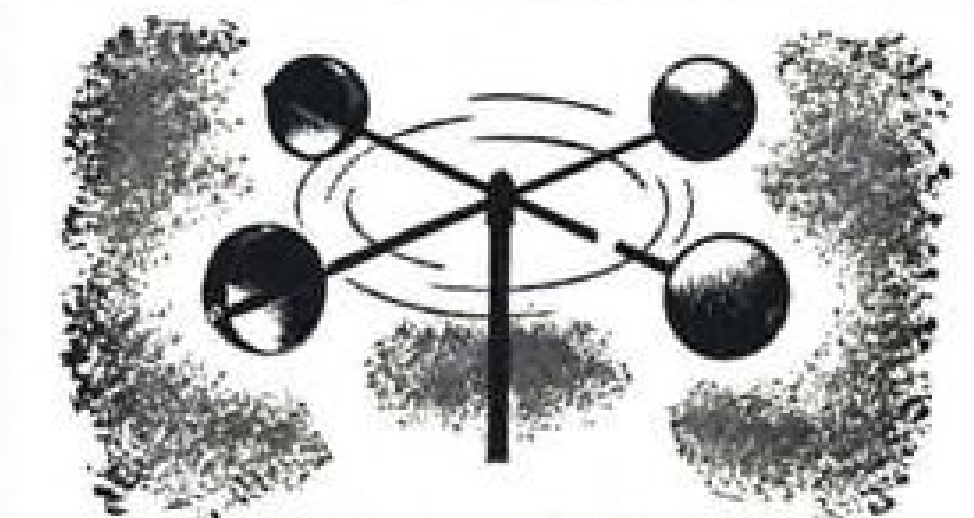
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EDITORIAL

Higher Plane Prices

A startling claim that aircraft prices have soared 287 percent since Korea is made by one Murray D. Lincoln of Columbus, O. He said so before the convention of the co-operative league of the U. S. A. Mr. Lincoln was speaking as president of this group. He is also a member of the National Mobilization Policy Committee of the National Security Resources Board.

When Mr. Lincoln's statement first appeared in the Los Angeles Times, we assumed the figure was a typographical error. A careful check discloses that this figure appeared in Mr. Lincoln's manuscript and was so delivered. Written inquiry to Mr. Lincoln so far has failed to bring a reply regarding the source of this provocative statistic.

If Mr. Lincoln had delved deeper into the subject he would have learned that unit costs of planes contracted for since the Korean outbreak have actually gone down because of the larger numbers of aircraft ordered. So far this fiscal year the Air Force, for example, has contracted for three times as many planes as were ordered under the entire fiscal 1950 appropriation.

Under Secretary McCone of the USAF in recent testimony on Capitol Hill said that various increased prices in raw materials used in aircraft, plus probable wage increases, would soon increase the price of planes bought by the Air Force by 7 to 8 percent. But this would occur in the future. It has not yet occurred.

The latest authentic information on the subject was issued recently by the Aircraft Industries Assn. The AIA reported that the total increase in aircraft prices over the past 10 years was 143 percent, contrasting with an increase over the same period of 733 percent for tanks and 471 percent for destroyers. As AIA points out, the 1950 airplane will fly twice as fast as its 1939 predecessor, has a range almost twice as great, and carries far more complicated and costly instruments than the 1939 airplane.

Mr. McCone's estimate of a 7-to-8-percent increase in the near future, and the AIA's 143-percent increase over the past 10 years, are in wild conflict with Mr. Lincoln's claim of a 287-percent jump since June 25. We hope his "estimate" gets no further circulation without supporting proof, which so far has not been forthcoming.

Pity the Traveling Salesman

Too many companies in our aviation industry are likely to consider the visiting traveling salesman more a pest than someone who might save them money or offer a needed product. Our transcontinental traveling salesman recently revealed two aviation companies, at least, who can never be accused of discouraging new ideas

from their vendors, and it is gratifying to give both of them publicity on this page.

At Wichita, while visiting Cessna Aircraft Co., we could not help noting a neat plaque at the company's main executive entrance of the plant. It says "salesmen welcome."

At United Air Lines' impressive maintenance and overhaul base at San Francisco there is a big sign, in red, we believe, announcing in giant letters visible all the way across the parking lot that all sales representatives will find a welcome there.

This is in the American business tradition—a constant effort by management to find cheaper, better ways of doing the job.

Robert H. Wood

He's Burned Up!

(A Letter From a Reader)

I take your magazine. To me it is a fine magazine and I read it every week cover to cover but when I get to your editorial page I really burn.

I am the owner of a 190 cubic inch racing plane (Shoestring No. 16). To me your editorial's against these ships and the races and shows we put on. I don't see your writing anything about 58 people killed in a plane crash in the river or 55 killed in a Connie crash. Why take it out on us guys?

You always bring up Bill Odum's crash at Cleveland. Well I was there along with some of the best pilots in the country (Tony Le Vier, Herman "Fish" Salmon and Joe DeBona)

Flaming Crash Kills Stunt Flier

By the Associated Press.

NORFOLK, Va., Oct. 30.—A 34-year-old stunt flyer piloting a tiny acrobatic plane he designed and built himself, crashed to a fiery death here yesterday before 30,000 spectators.

Charles Edward Bailey, of Madison, N. C., had thrilled the crowd at Municipal Airport with aerial acrobatics for 10 minutes before the fatal maneuver.

we all seen Bill go in and I would say there were only twenty people at the most seen him go in and not 90,000 like you say. So much for that. These 190 cubic inch planes are doing very much toward and for the good of aviation. Look at the 85 h.p. Cont. engines. The engine is really working out. The airframes are designed by some of the best engineers in the business.

Your last editorial quote (How much longer will aviation tolerate deliberate invitations to death) unquote. Did you think very much or very hard before you wrote this line? Why don't you come out and meet some of the boys and look the ships over and then think of that one line all over again. I would like you to put this in your letters to the editor column.

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AVIATION WEEK, November 13, 1950

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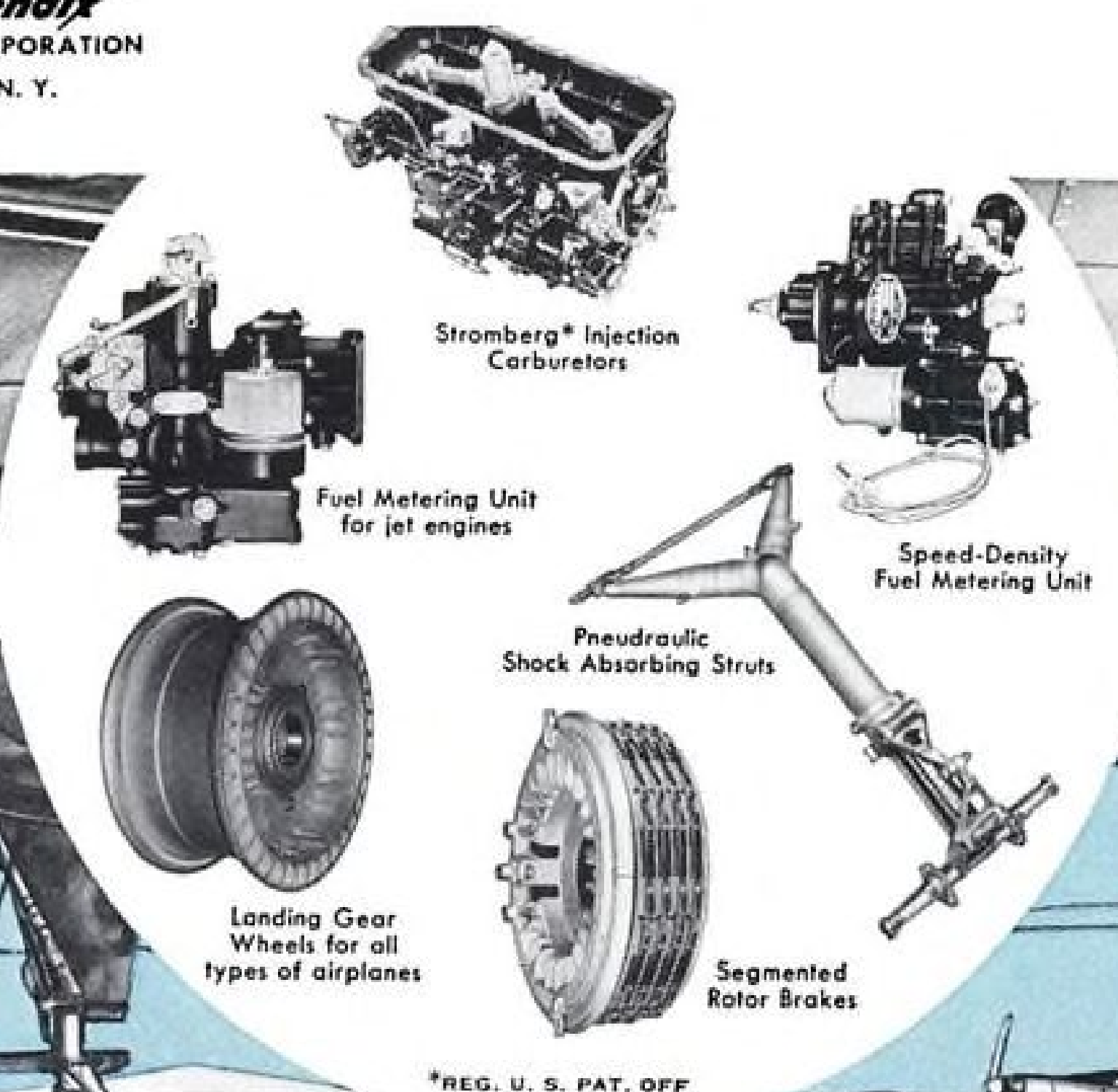
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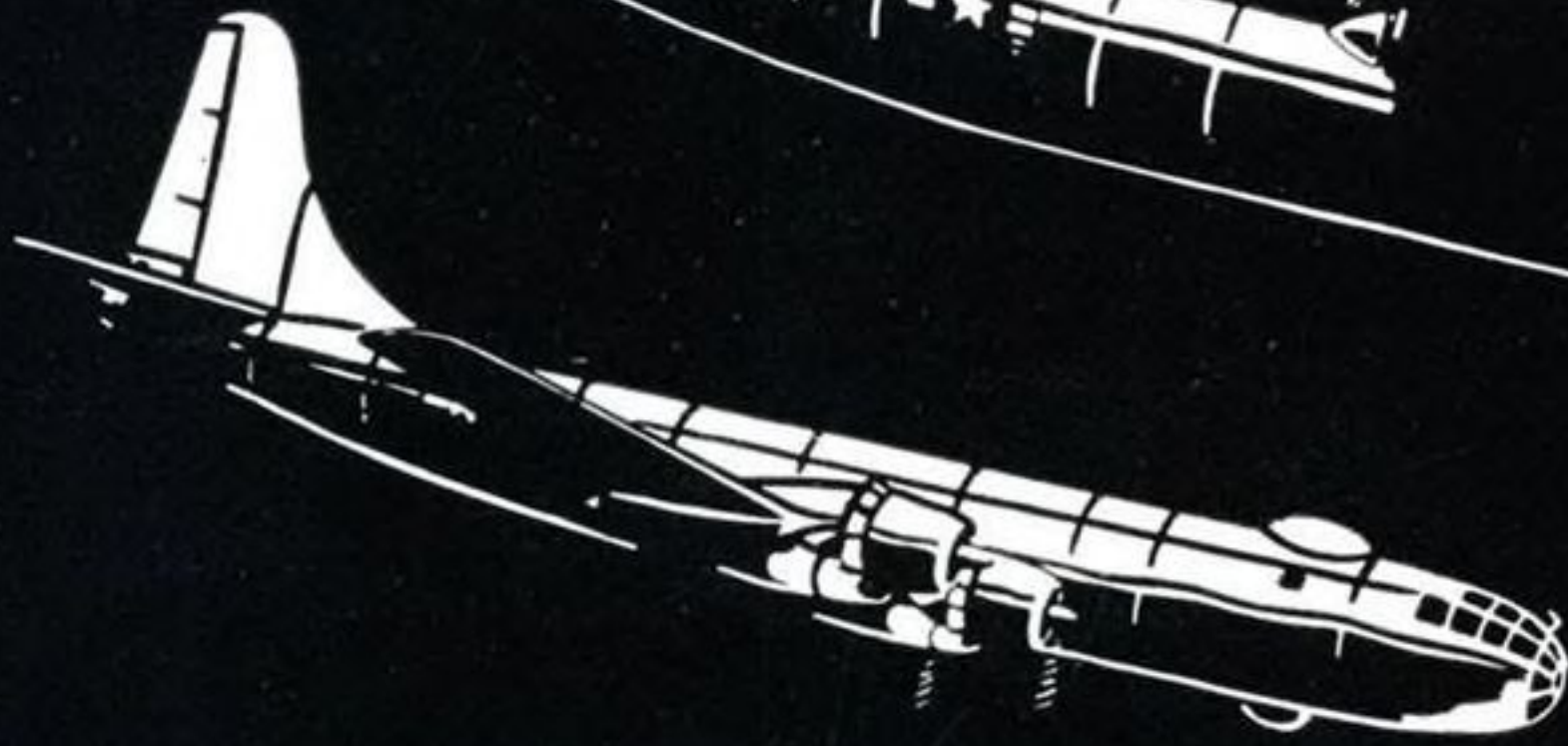


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