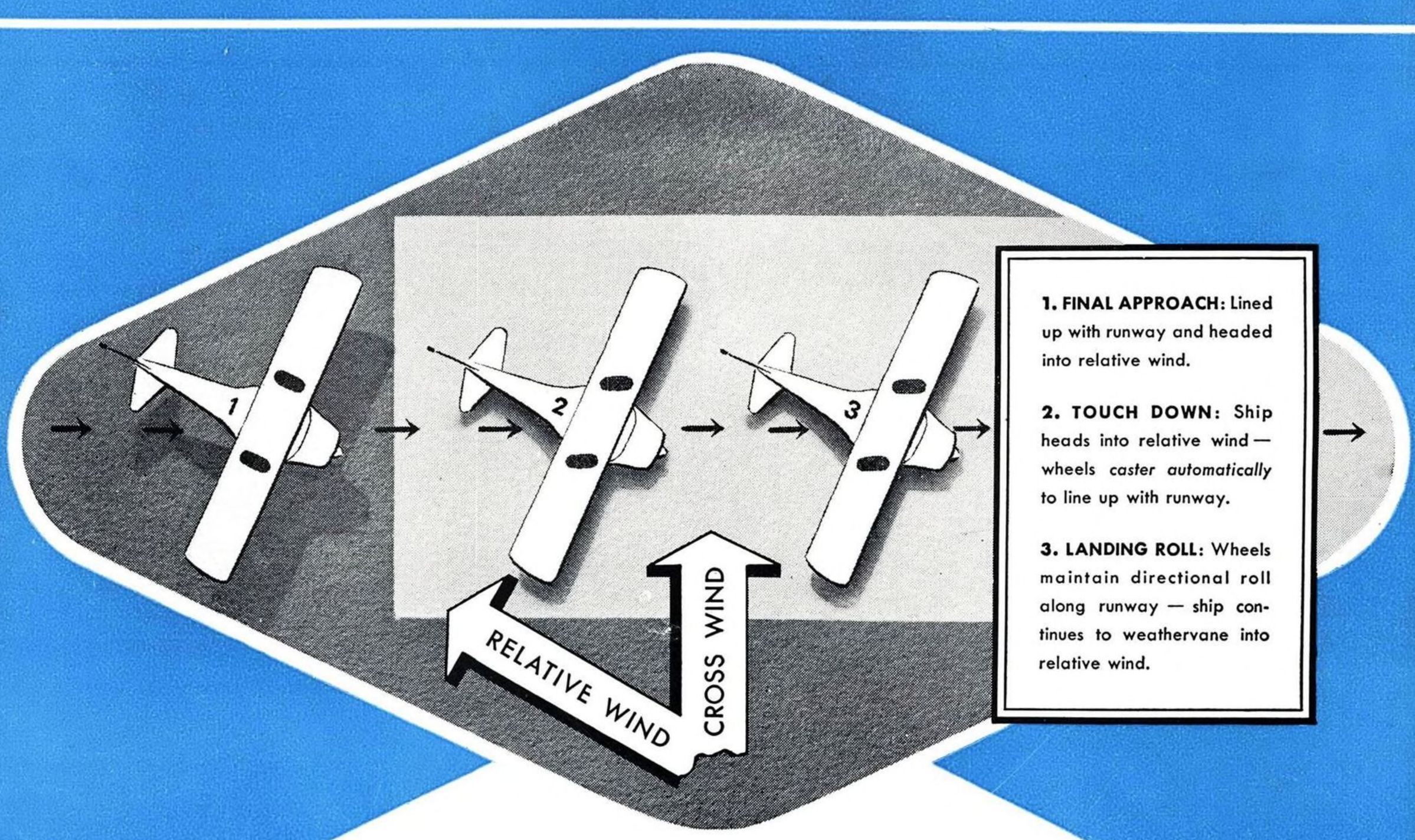
AVIATION WEEK

A McGRAW-HILL PUBLICATION

OCT. 18, 1948



Now you can land cross-wind

—with the new Goodyear Cross-Wind Landing Wheel, now available for Stinson, Cessna and other ships. Developed for the C. A. A. by Goodyear, this revolutionary gear offers these major advantages: use of single-strip airports—more flying hours—flight training in less time, with less damage to wing tips and props—increased revenue to flight-school operators. For complete information about the new Goodyear Cross-Wind Landing Wheel, write: Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.

1898 GOODYEAR 50 ANNIVERSARY 1948

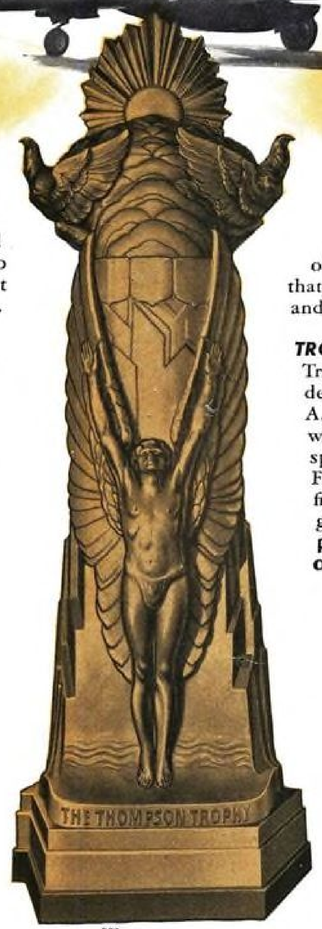
GOODYEAR AVIATION PRODUCTS

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

Anson L. Johnson, Thompson Trophy Winner

1948 NATIONAL AIR RACES, CLEVELAND AIRPORT
SEPTEMBER 6

300 miles—20 laps of a 15-mile quadrangular course—
average speed of 383.767 miles per hour



THE PILOT: Anson L. Johnson of Miami Springs, Florida, former lieutenant in the U. S. Air Forces. During War II, he served as ferry and transport pilot. He learned to fly at the age of nineteen. Now twenty-eight years old, he is a pilot for National Air Lines.

THE PLANE: The ship flown by Johnson was a converted P-51 Mustang fighter powered by a Packard-Merlin engine. It is Johnson's own, readied for the "Thompson" by himself—he had no sponsor.

THE EVENT: The Thompson Trophy Race, initiated in 1929, has become an institution. It is the recognized world-classic for air speedsters around a closed course. To fly this tight closed course is a gruelling test of both plane and pilot. It calls for skill, daring and judgment. Pilots must wear shoulder straps, crash helmets and parachutes.

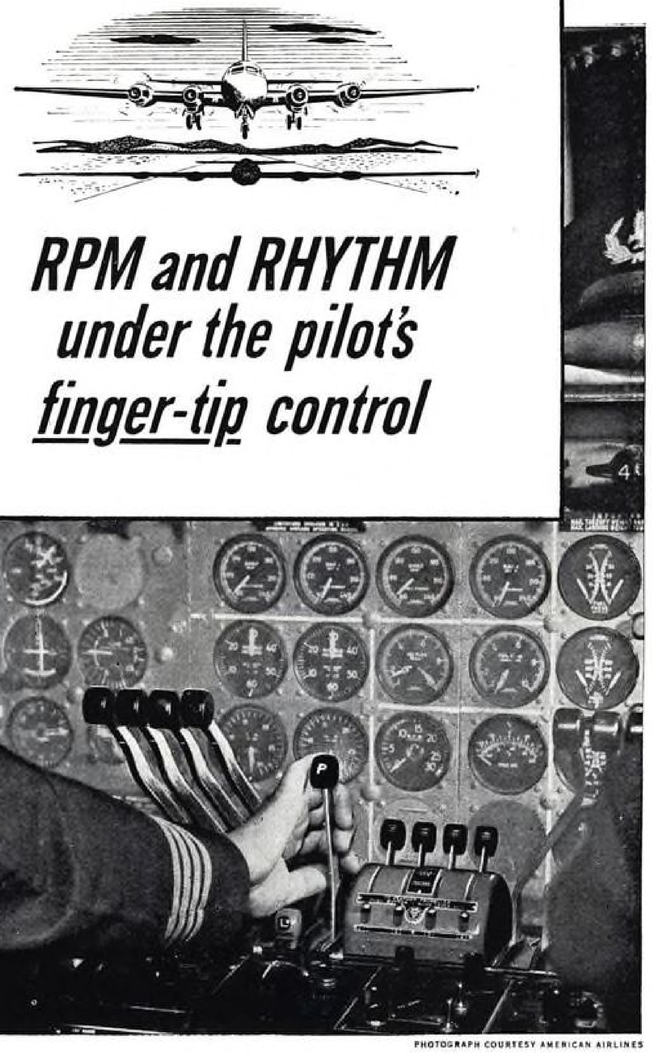
THE PURPOSE: The National Air Races is a great proving ground for innovations in wing and motor. The "Thompson", because it demands constant banks, is a revealing test of a plane's speed and stamina under conditions that require utmost maneuverability with wide-open throttle. Just how severe is witnessed by the fact that 7 out of 10 entries in the 1948 event were forced out under a blistering 400 miles per hour pace; the fastest single lap was 413.097 miles per hour. The "Thompson" is dedicated to the development of faster, *safer* planes—the combination that will hold our Country's commercial and military leadership in the air.

TROPHY AND AWARDS: The Thompson Trophy itself is of bronze, 40 inches high, designed by the noted sculptor, Walter A. Sinz. This prized trophy is engraved with each winner's name and average speed, and held by him for one year. For permanent possession pilots who finish first, second and third receive gold, silver and bronze plaques. The prize purse for 1948 was $40,000.00, of which Johnson received $16,500.00.

THOMPSON TROPHY WINNERS:
1929—Davis, 194.90 mph • 1930—Holman, 201.91 mph • 1931—Bayles, 236.23 mph • 1932 Doolittle, 252.68 mph 1933—Wedell, 237.95 mph • 1934—Turner, 248.12 mph • 1935—Neumann, 220.19 mph • 1936—Detroyat, 264.26 mph • 1937—Kling, 256.91 mph 1938—Turner, 283.41 mph • 1939—Turner, 282.53 mph • *1946*—(Piston Engines) Johnston, 373.90 mph • (Jet Engines) Lundquist, 515.85 mph • *1947*—(Piston Engines) Cleland, 396.13 mph • (Jet Engines) Petit, 500.70 mph.

Thompson Products, Inc.
CLEVELAND • DETROIT LOS ANGELES • ST. CATHARINE, CANADA

MANUFACTURERS OF PRECISION AUTOMOTIVE AND AIRCRAFT PARTS



RPM and RHYTHM under the pilot's finger-tip control

PHOTOGRAPH COURTESY AMERICAN AIRLINES

● CURTISS AUTOMATIC SYNCHRONIZATION makes propeller RPM control and engine RHYTHM a simple, one-lever, finger-tip operation for pilots of modern multi-engined airliners.

● A single lever propeller RPM control—located in the cockpit—establishes the constant speed setting for each flight condition.

. . . and at the same time maintains accurate synchronization—uniform RPM—of *all* engines through an automatic synchronizer master unit.

● As a result, CURTISS AUTOMATIC SYNCHRONIZATION . . . . . eliminates noisy, tiring, off-rhythm engine "beat."

. . . releases the pilot for other important duties during *take-off, climb, let down* and *landing*.

. . . assures more comfort and relaxation for himself, his crew and his passengers.

Other famous Curtiss Propeller features **include *reverse thrust* and *hollow steel blades*. Like *automatic synchronization*, these features were first introduced to service by Curtiss and service-proved on commercial airline and military aircraft.**

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PROPELLER DIVISION CURTISS WRIGHT CALDWELL, NEW JERSEY
FIRST IN FLIGHT

CURTISS ELECTRIC PROPELLERS

AXELSON FIRST CHOICE

TOP FLIGHT

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that Axelson engineering and plant facilities for the production of high precision aircraft components are among the finest available.

FOR PRECISION AIRCRAFT PARTS

such as landing gears, hydraulic struts, hydraulic actuators, gear boxes, transmissions, superchargers and variable speed drives, alternator drives and pressure regulator valves, Axelson is considered first choice by world leaders in aircraft manufacture.

Axelson is currently producing superchargers for cabin pressurization of the Douglas DC-6 airplane. Numerous Axelson experimental projects are under way, in design stage, production stage and on actual operating tests. Axelson engineering maintains constant research to provide more efficient equipment, combining economy with finest quality.

THERE IS NO ECONOMICAL SUBSTITUTE FOR QUALITY

AXELSON
MANUFACTURING COMPANY

AIRCRAFT DIVISION

6160 South Boyle Ave.
Los Angeles 11, Cal.

Vol. 49, No. 16 — **AVIATION WEEK** — October 18, 1948

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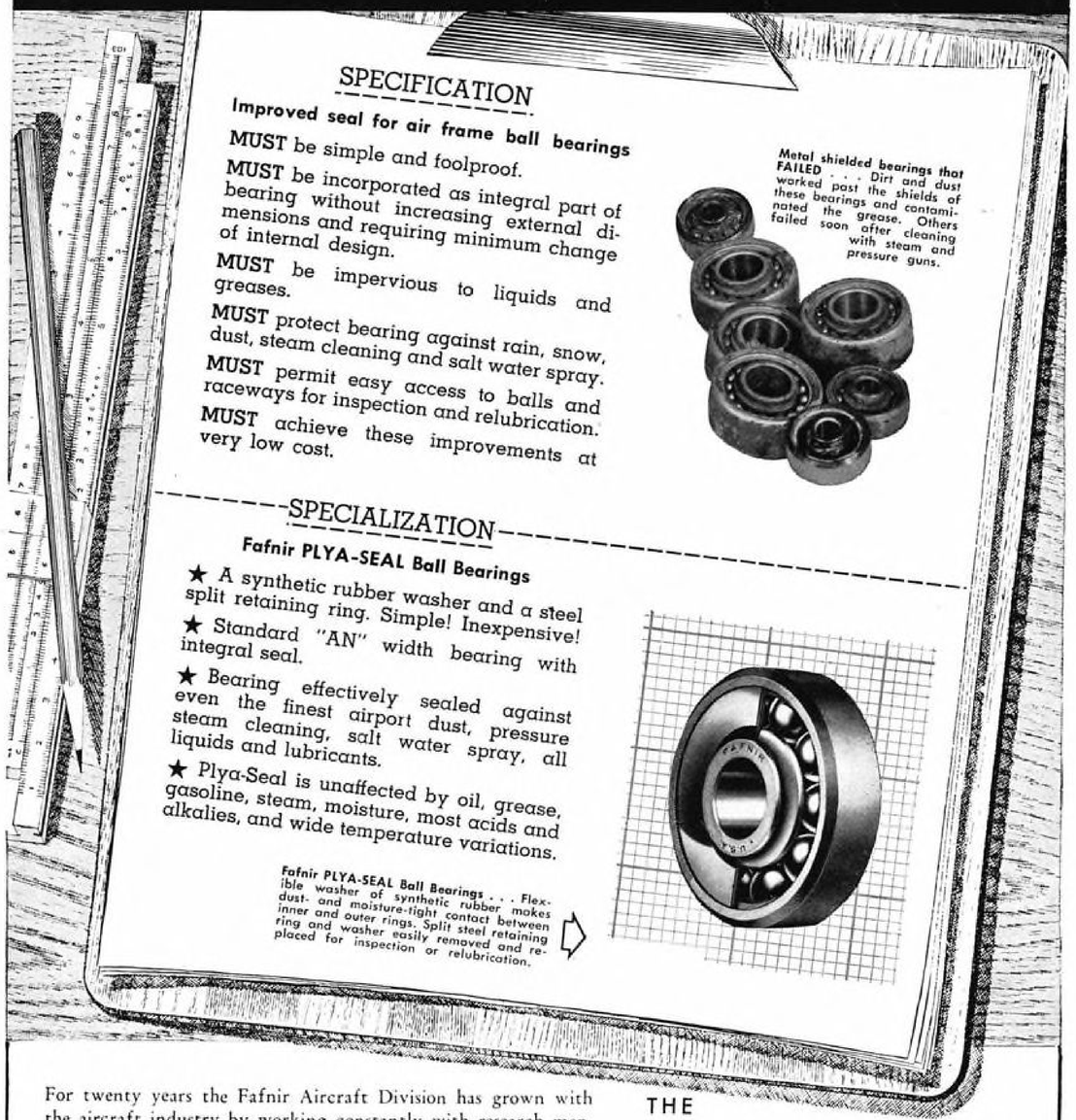
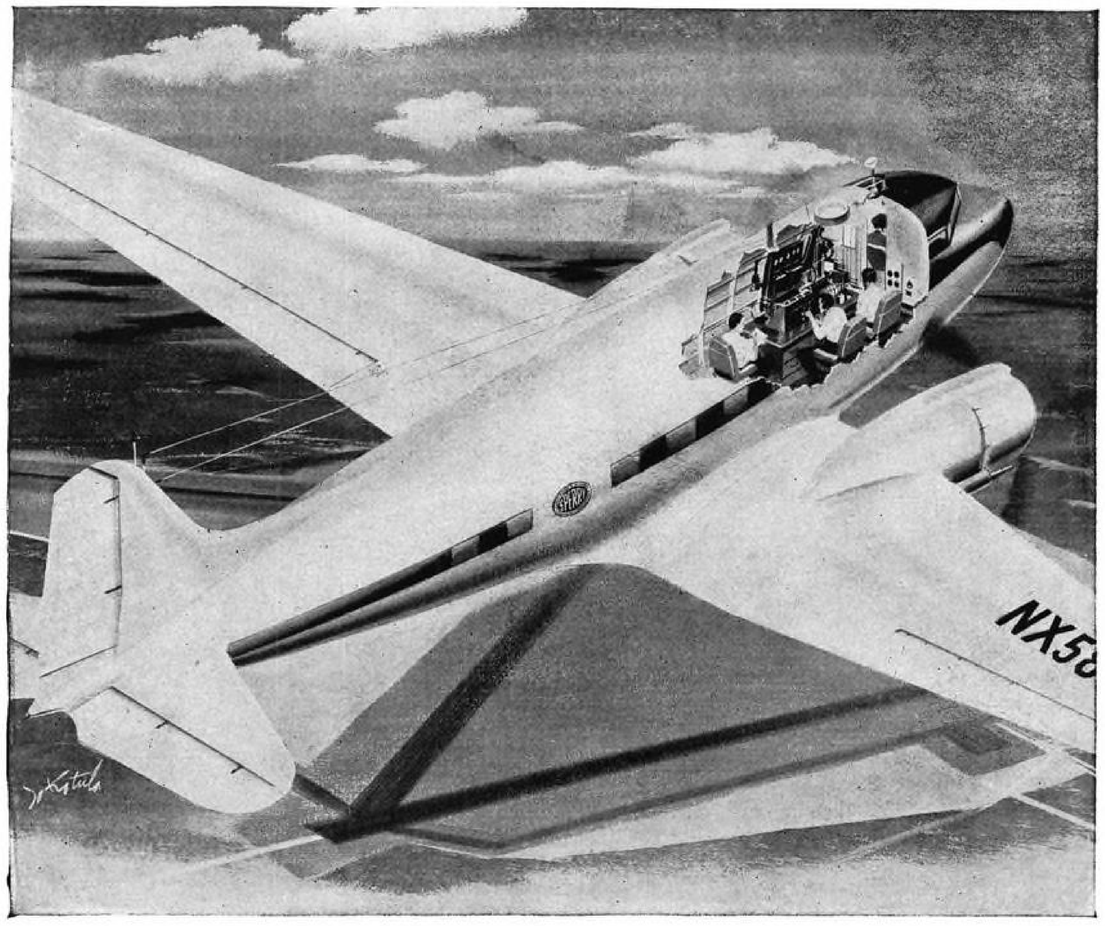
Aircraft ball bearing development in step with aviation progress



For twenty years the Fafnir Aircraft Division has grown with the aircraft industry by working constantly with research men, designers and engineers. That's how these Fafnir specialists got the industry habit of regarding a job done as just the beginning of a job to do . . . using each new achievement as the take-off for another advance.

That is also why Fafnir has been responsible for the major developments in ball bearings for aircraft. And why Fafnir is the logical first choice for either aircraft ball bearings or for air-minded collaboration in solving new bearing problems. The Fafnir Bearing Company, New Britain, Conn.

THE **FAFNIR** Aircraft Ball Bearing **Division**



AVIATION RESEARCH *Takes to the Air!*

Aviation research takes to the air every day at Sperry. In thousands of flights, engineers obtain accurate data to test current developments in aviation . . . anticipate needs for new equipment. This continuous research helps the airlines cut operating costs . . . make air travel more and more attractive . . . increase passenger and cargo loads.

The "Flight Center" at MacArthur Field, Long Island is supported by the entire Sperry research and engineering organization. These groups — working with the research facilities of the airlines — constantly strive to develop aviation equipment that increases schedule reliability and confidence in air transportation.

A specific example of Sperry-Airline research cooperation is the Engine Analyzer—a "trouble shooter" that checks engine performance during flight, saves valuable time on the ground. The idea of the Engine Analyzer originated with an airline, was developed by Sperry with their cooperation.

And from knowledge of airline requirements, gained in actual flight, Sperry has developed other equipment such as the Sperry A-12 Gyropilot* for smooth, level flight . . . the Automatic Approach Control to guide every airliner safely down to the runway . . . the Gyrosyn* Compass and other flight instruments for accurate information on position and direction.

Meanwhile, Sperry research and engineering development laboratories are working on tomorrow's aviation problems while finding new and better solutions to today's.

*TRADEMARK REG. U. S. PAT. OFF

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NEWS SIDELIGHTS

Air Parcel Post

Post Office officials are disappointed—but not discouraged—at first rough estimates placing the September air parcel post volume at between 250,000 and 300,000 lb. This is radically below the 50,000,000-lb.-a-month volume — ten percent of the current surface parcel post business — the Department envisions eventually.

Both Post Office and airline officials agreed that the main reason for the poor first month showing on air parcel post was delay in promotion. Business circles and the public generally are not yet widely acquainted with the new service. The advertising campaign to put it across is just now getting into full swing.

Air Transport Association reports that air parcel post to date has not made a noticeable dent in Air Express business, which has leveled off recently.

Parts Evaluation

The Air Force and Navy are taking another close look at the $450,000,000 worth of surplus engines and parts which the War Assets Administration is trying to peddle before it goes out of business next Feb. 28. The tremendous strain on military transport aircraft imposed by "Operation Vittles" has inspired the armed services to see whether they don't need considerably more of the materiel than thought when they made a survey last spring.

Both WAA and the military are afraid of Congressional explosions if they are forced to sell as junk large quantities of aircraft parts for which bids were not obtainable. Besides, parts sold at junk prices for remelting have a way of going out back doors and appearing on the market again.

Break for Alaska

Residents of Alaska who believed they were "gouged" by airlines hauling cargo into the territory during the eight-week West Coast maritime strike of 1946 find themselves getting a better break during the present shipping tieup.

In 1946, Alaskans contend, some airlines (especially nonscheduled operators) charged exorbitant rates for hauling freight up from the Pacific Northwest. This year, with more planes available and more companies competing for the business, both passenger and cargo rates on the Alaskan run have actually dropped during the strike. Pan American Airways also has cut charges for flying eggs and dairy products to Hawaii, which, like Alaska, has been isolated by the maritime dispute.

Air Force Shuffle

U. S. Air Force will continue its reshuffle of the high command to consolidate the administration of Chief of Staff Hoyt Vandenberg. Next to go from the top level will be Gen. Muir S. Fairchild, now vice-chief of staff. Fairchild, who will soon be eligible for retirement, will be replaced by Lieut. Gen. Lauris Norstad, now deputy chief of the Air Staff for Operations.

Gen. Joseph T. McNarney is not expected to remain as head of the Air Materiel Command much longer. Most likely successor to McNarney is Maj. Gen. K. B. Wolfe, now AMC director of procurement and industrial planning.

Next on the Quiet Program

Next project on the slate for Aeronautical Research Foundation at Boston, is to try the soothing effects of mufflers, reduction gearing, and multiblade propellers, on the Goodyear Duck amphibian.

Pusher amphibians are considered one of the most serious offenders among present day airplane noise makers. The quieting formula was demonstrated effectively last week on a Stinson Voyager and a modified Piper J-3, and presumably there will be no major difficulties in making a "good neighbor" for close-in airpark flying in residential districts, out of the Duck, as well.

Court Fight on Flight Training?

Blame for maladministration of the GI flight training program was placed squarely on Veterans Administrator Carl Gray by Harold A. Keats, newly-elected national commander of AMVETS, last week, in a statement preliminary to filing federal legal action against Gray.

Keats said AMVETS was studying typical cases in which veterans had been denied flight training, before filing a suit asking a declaratory judgment interpreting the GI bill of rights and amendments, and an injunction from federal court to enforce the findings. "The arbitrary and anti-veteran attitude of the Administrator in demanding detailed and endless individual justification of such (flight) courses, leaves us no alternative," Keats said.

Long Range Bombers

Strategic significance of the Convair B-36B rolling off the Fort Worth production line is that USAF will soon have a combat group capable of delivering the atomic bomb in significant quantities to any possible Eurasian foe without the tip-off of a move into advanced bases.

For example B-29 groups now in England are an atomic-pistol pointed at Europe but would face a heavy defensive concentration because potential enemies are already well-warned of attacks from that quarter. However B-36Bs taking off from North American bases would give no advance warning and could use a wide variety of approaches to target areas.

Recent RAF-USAF maneuvers over England indicated that even the highly developed British radar-night fighter system was not effective against high altitude night bombers using radar counter-measures. The B-36B will rely primarily on cover of night or bad weather, radar counter-measures and altitude for its defense rather than armament or the parasite fighter.

Labor Shortage???

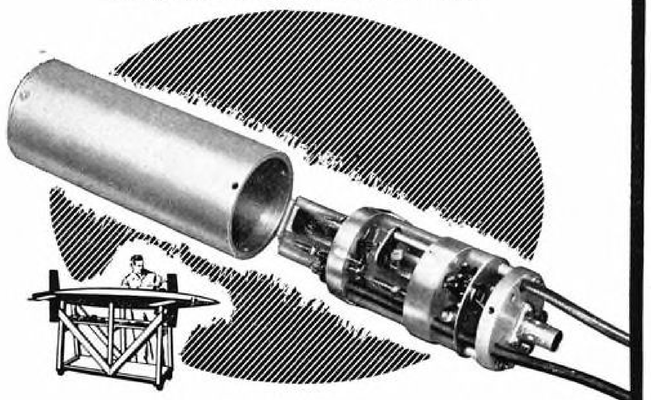
U. S. Employment Service believes the aircraft industry will not have too much trouble in drawing labor from other fields to man its expanded production program. Relatively high wages, better working conditions and large-scale use of women are the main attractions on the aircraft assembly line, says USES. Skills hardest to get will be aeronautical draftsmen, sheet metal workers, electricians and mechanics with A and E licenses.

Lockheed Labor Peace

The three-year study of the National Planning Association on the "causes of labor peace" will include a report on the peaceful relations of Lockheed with the International Association of Machinists, independent union. Being prepared by Dr. Clark Keer, director of the University of California Industrial Relations Institute, it will be one of 15 reports made by NPA.

FOR THE NEW TELEMETERING BAND

Bendix Pacific
MODEL TXV-2A
TRANSMITTER

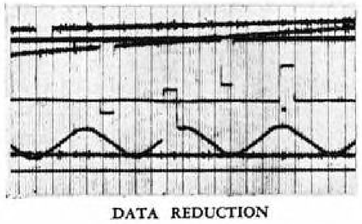


The Bendix Model TXV-2A Transmitter is a VHF direct FM transmitter developed to supplement a complete line of telemetering components designed for use in the FM/FM subminiature telemetering system.

Complete telemetering facilities are available at Bendix Pacific including not only the manufacture and supply of components, but also installation and application engineering, field operations, data reduction and engineering consultation.

SPECIFICATIONS

Frequency range: 209 mc to 227 mc
Modulation: to ± 125 kc
Power required: 135 volts at 40 ma and 6 volts at 0.45 amp.
Nominal output: 0.5 watt into 51.5 ohms
Weight: .875 pounds
Case Dimensions: 2 inches in diameter–5⅛ inches long (excluding connectors)



DATA REDUCTION

Additional information on the TXV-2A Transmitter or other telemetering components or services is available upon request from qualified companies.

PRODUCT OF Bendix AVIATION CORPORATION

Pacific Division
Bendix Aviation Corporation
NORTH HOLLYWOOD, CALIF.

East Coast Offices: 475 Fifth Ave., New York 17, N.Y.

AVIATION CALENDAR

Oct. 17-21—National Aviation Clinic, Detroit.
Oct. 18—AIA Personal Aircraft Council, Detroit.
Oct. 18-23—American Society of Travel Agents, Savannah, Ga.
Oct. 20-21—National Safety Council, Air Transport Section, Hotel Stevens, Chicago.
Oct. 21-22—Society of Automotive Engineers production meeting, Statler Hotel, Cleveland.
Oct. 22-23—4th Annual Arizona Aviation Conference, sponsored by Chamber of Commerce, Prescott.
Oct. 22-24—Idaho Flying Farmers convention, Lewiston, Idaho.
Oct. 25-26—Third Annual Indiana Aviation Conference, Purdue University, Lafayette, Ind.
Oct. 28—Society of Automotive Engineers, metropolitan section, transportation and maintenance meeting, Engineering Societies Bldg., New York City.
Nov. 4-5—Society of Automotive Engineers, fuels and lubricants meeting, Mayo Hotel, Tulsa, Okla.
Nov. 7-13—Flight Safety Foundation aircraft accident investigation course, Woods Hole, Mass.
Nov. 10—Aircraft Industries Assn. ETC-PTC committee meeting, New York City.
Nov. 13-16—American Society for Testing Materials, petroleum products and lubricants, Drake Hotel, Chicago.
Nov. 15-17—Aviation Distributors and Manufacturers Assn., sixth annual meeting, Hotel Statler, Cleveland.
Nov. 15-17—National Aviation Trades Assn., annual meeting, Allerton Hotel, Cleveland.
Nov. 16—Aircraft Industries Assn. ATC panel meeting on AN-D-12A, Van Cleve Hotel, Dayton, Ohio.
Nov. 16-17—American Society for Testing Materials, plastics, Atlantic City, N. J.
Nov. 16-18—National Association of Travel Officials, Miami Beach, Fla.
Nov. 17-18—Aircraft Industries Assn. Air Force-Navy-Industry (ATC) meeting on AN-D-12A, Wright-Patterson Air Force Base, Dayton, Ohio.
Nov. 17-19—American Society for Testing Materials, electrical insulating materials, New York City.
Nov. 18-19—American Society for Testing Materials, structural sandwich materials, Philadelphia.
Nov. 23—ICAO southeast Asia regional air-navigation meeting, New Delhi.
Dec. 2-5—Annual meeting of the Society for Experimental Stress Analysis, Hotel Commodore, New York City.
Dec. 2-5—Fourth annual international aviation celebration, El Paso.
Dec. 17—Annual Wright Brothers Lecture, Institute of the Aeronautical Sciences, U. S. Chamber of Commerce Bldg., Washington, D. C.
Jan. 5, 1949—Florida Flying Alligator Club, 14th annual reunion, Melbourne, Fla.
Jan. 10-14—Society of Automotive Engineers, Annual Meeting and Engineering Display, Hotel Book-Cadillac, Detroit, Mich.
Jan. 24-27—IAS seventeenth annual meeting, Hotel Astor, New York City.
Jan. 27—Society of Automotive Engineers, metropolitan section, fuels and lubricants meeting, Engineering Societies Bldg., New York City.
Feb. 8—ICAO Operations Division. Place undetermined.
Feb. 22—ICAO Airworthiness Division. Place undetermined.
April 3-6—American Assn. of Airport Executives, Oklahoma City.
Apr. 11-13—Society of Automotive Engineers, National Aeronautic and Air Transport Meeting, Hotel New Yorker, New York.

PICTURE CREDITS:
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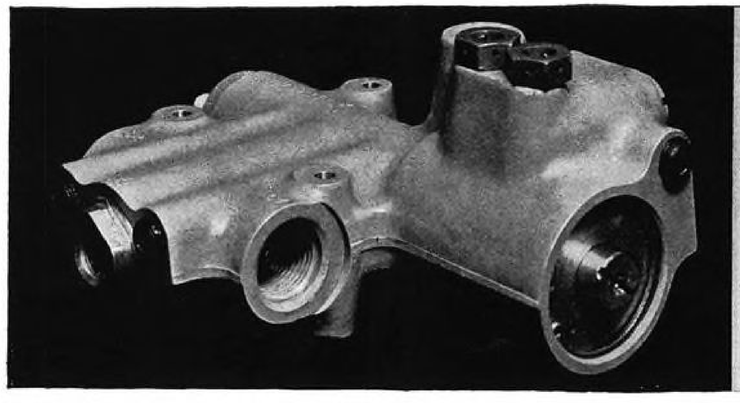
THE HEART OF THE REPUBLIC
THUNDERJET AILERON CONTROL SYSTEM
IS THE ELECTROL POWER BOOST CONTROL VALVE



THE POWER BOOST CONTROL VALVE developed by ELECTROL for the REPUBLIC THUNDERJET P-84 aileron control system is *another* example of the use of ELECTROL products where dependability is essential.

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FOR BETTER HYDRAULIC DEVICES

FROZEN STIFF—

without this miraculous new oil cooler!

In the icy air—up 20,000 feet where the giant Douglas DC-6 flies—oil is kept flowing freely by a wonderful new AiResearch device.

This AiResearch oil cooler, tailored especially for the DC-6, weighs less than 35 lbs. It keeps oil flowing smoothly no matter how cold or hot flight temperatures become. And a vital element—the atmospheric surge protection valve—eliminates possible failure and assures a constant flow of oil under the most extreme operating conditions.

Now standard equipment on all U. S. planes serving airlines here and abroad, this and other types of AiResearch oil coolers make possible high-altitude flight and extreme high speeds of the new turbo jets.

AiResearch pioneered these oil coolers of weight-saving aluminum instead of heavy copper. And, of utmost importance, AiResearch perfected the exclusive "mechanical joint" construction, so that cleaning and repairs can quickly and easily be done in the field with no sacrifice in performance. Furthermore, to meet rigid Air Force Spec ANC 75, every AiResearch oil cooler design is tested exhaustively in our own extensive laboratories.

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

Write: AiResearch Manufacturing Company
Los Angeles 45, California

AiResearch
DIVISION OF
THE GARRETT CORPORATION

NEWS DIGEST

DOMESTIC

Robert J. Collier Trophy committee will meet in Washington this week to select the winner for 1947 of the award given annually for the greatest achievement in U. S. aviation.

Maj. Alford J. Williams last week presented his twelve-year-old Grumman F3F "Gulfhawk" to the Smithsonian Institution. The orange and black-striped biplane, often seen at air shows, was believed to be the last of its type operational.

Karl Compton, president of Massachusetts Institute of Technology, last week succeeded Dr. Vannevar Bush as chairman of the National Defense Research and Development Board. Bush returns to the presidency of Carnegie Institution of Washington.

Twelve Navy fighter and attack planes, F4Fs, F8Fs, AD-1s, made a two-stop Moffett Field, Calif.-Honolulu flight, refueling on carriers stationed at 800-mi. intervals. Flight was to practice over-water ferrying method.

Delta Air Lines has taken delivery on the first of five DC-6s. Remainder are expected to be accepted before the end of the year.

FINANCIAL

National Aviation Corp. reports net income for nine months ending Sept. 30 of $123,902, after taxes but before security transactions. Net loss on securities sales amounted to $156,956.

FOREIGN

Sir Arthur Whitten-Brown, who made the first nonstop Atlantic crossing with the late Sir John Alcock in June, 1919, died in London at the age of 62. In a Vickers Vimy bomber, the two flyers made the 1950-mi. crossing from Newfoundland to Ireland in 16 hr., 12 min.

Australian government has objected to the Canadian government's plan to authorize Canadian Pacific Airways to operate a trans-Pacific service jointly with Australian National Airways. Australian government has long been opposed in principal to operation of international services by privately-owned airlines.

Civil Aeronautics Administration has opened a new branch in Buenos Aires. Office will be headed by O. L. Wallace, formerly with CAA in Washington.

Pakistan will establish a government-owned repair and overhaul base to handle work for the country's two airlines. Company is capitalized at $1.2 million, with the government putting up $630,000 and Orient Airways and Pak-Air each contributing $570,000.

INDUSTRY OBSERVER

► Chance Vought's new tailless Navy jet fighter (XF7U-1) has made its initial test flights at the Naval Air Test Center, Patuxent, Md. The XF7U-1 is powered by a pair of Westinghouse 24C jet engines located at the wing roots on either side of the fuselage. It has the elevon control system developed for Northrop Flying Wing type aircraft but also uses rudder controls on the two vertical fins located on the wings for increased stability. Leading edge flaps are used to get high lift characteristics out of the XF7U-1 swept back wing at low speeds. Armament is housed in the nose. Except for the location of the vertical fins, the XF7U-1 configuration is roughly similar to that of the Northrop X-4, high speed research plane.

► A. V. Roe of Canada are building the XC-100, twin jet night fighter for the Royal Canadian Air Force, in Toronto, with hopes of also selling it to the Royal Air Force and the U. S. Air Force. The two jet engines, also being developed by Avro, are mounted above the wing roots on either side of the fuselage. Tricycle landing gear and a relatively long afterbody with a single tail are other design features.

► Another Avro Canadian project for a jet bomber trainer (XC-101) has been abandoned after construction of a mockup because of anticipated production difficulties. This trainer was to have been powered by the Chinook, a Canadian-built jet engine.

► DeHavilland is working on a new fighter project designed to replace its famous Mosquito. The new fighter will feature twin jets, swept-back wing and tail surfaces, and twin tail booms. Meanwhile deHavilland's jointly-owned company, Airspeed, is producing the Mosquito Mark 38, a new night fighter version of the plywood bomber. Sweden is expected to place another order for more Vampire jet fighters with deHavilland.

► Convair-Liner production at San Diego has reached the rate of 28 transports per month. Convair spokesmen tell Aviation Week that by the end of October 89 units will have been completed. At the end of September 61 planes had been delivered as follows: American Airlines, 37; Pan American, 15; Western Air Lines, 4; Continental Airlines, 2; KLM, 2; and Trans-Australia Airlines, 1.

► Curtiss-Wright claims that the XF-87, four jet night fighter, flew at better than 600 mph. during Phase I flight tests at Muroc. Company did not specify whether the mark was made in level flight. Lee Miller, Curtiss-Wright test pilot from the airplane division in Columbus, and Maj. Richard L. Johnson, USAF holder of the world speed record, are doing the test work on the F-87. Production model F-87s will be redesigned for twin General Electric J-47 jets.

► McDonnell's XF-88 long range USAF fighter now at Muroc for flight testing, will carry six 20 mm cannon in its nose and is expected to climb at better than 15,000 feet per minute. Maximum operating range should be more than 2100 miles.

► Howard Hughes will begin new water tests of his huge flying boat during October with flight tests scheduled for December. Hughes lifted the big boat off the water briefly last November during high speed taxi tests but no real flights have been made in the controversial craft.

► Aircraft production division, Australian Supply and Development Department has awarded a contract for an experimental aircraft incorporating boundary layer control. The new design will utilize the "tadpole" profile developed by Dr. Sidney Goldstein. The wing will be tried initially on a towed glider to determine basic design parameters before construction of the aircraft begins. Advantage of the shape is its use of as high as 40 percent wing thickness with its high lift yet with drag of a conventional wing only 10-12 percent thick.

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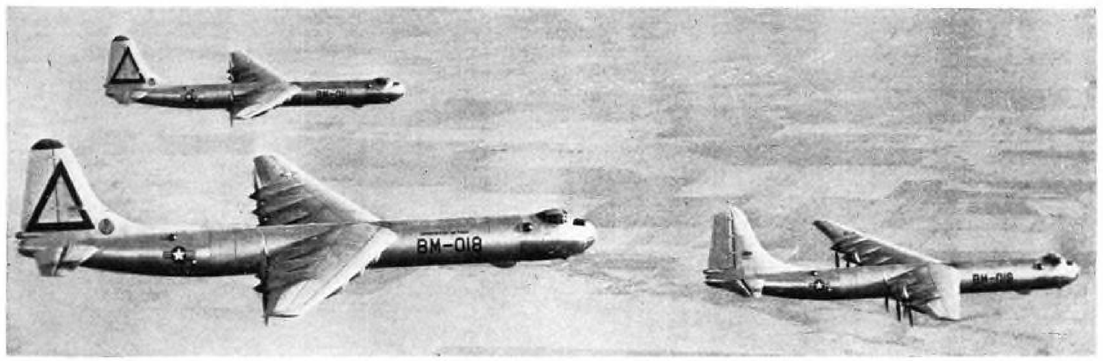


Disclosure of the B-36's far-reaching striking power was made at Ft. Worth during formation flights in the air, and . . .

New B-36 to Give USAF Greater Range

Data released for first time on B model of giant bomber, soon to go into service.

By Robert Hotz

Fort Worth, Tex.—By the end of this year the U. S. Air Force will have a striking force of Convair B-36B bombers capable of delivering atomic bombs over a 12,000 mile range.

This means that for the first time since the concept of strategic air power was originally propounded a nation has the technical equipment to put that theory into practice. With the approximately 20 Convair B-36Bs that will be delivered to the 7th Bomb Wing of the 8th Air Force by next January, that wing will be able to bring virtually all of the northern hemisphere under its radar bombsights from bases on the North American continent.

► **Bomber Testimonial**—Recognition of the B-36 equipped 7th Bomb Wing as the spearhead of the Strategic Air Command's striking force was formally made at a press demonstration here last week. Among the witnesses who offered a series of startling statistics in support of the B-36 were Gen. George C. Kenney, retiring chief of the Strategic Air Command, and an early sceptic on the combat efficiency of the B-36; Maj. Gen. Roger Ramey, 8th Air Force commander; and Maj. Stephen P. Dillon, chief USAF test pilot on the B-36 program.

Figures cited for the six-engine bomber:

- A 12,000 mile nonstop simulated combat mission will be flown this fall by a B-36B. The bomber will take off from New York, drop 10,000 lb. of bombs off Honolulu and return to New York without aerial refueling.
- The B-36B will do its bombing from 40,000 ft. at a speed of better than 350 mph. true air speed in the target area. This is with a full combat load of armament, ammunition and 10,000 lb. of bombs.
- The B-36A has flown an 8000 mile nonstop simulated combat mission dropping 25,000 lb. of bombs at the halfway point and averaging 223 mph. for the entire mission.

Maj. Dillon told of another B-36A mission he flew early in October carrying four 12,000 lb. bombs to Muroc. Bomb release trouble was encountered over Muroc leaving one 12,000 pounder hung up in the racks for the return trip to Fort Worth. Flying at 37,000 ft. the B-36A averaged 330 mph.

► **Training Models**—The B-36As with which the 7th Wing is now equipped do not have armament; are still experiencing some structural difficulties and have the usual accessory troubles of a large new aircraft. They are being used primarily for training and are not by any stretch of the imagination either fit or ready for combat.

With the B-36B the 7th, commanded by Col. Allen Clark, expects to be a fully-equipped combat organization. Already 13 Bs have rolled off the Convair line at Fort Worth with another 13 on the final assembly line. First deliveries of the B-36Bs to the 7th wing are expected next month. The 60-acre plant now turns out one B-36B per week.

► **Combat Versions**—The B-36B features a new version of the Pratt & Whitney R-4360-41 engine that boosts each horsepower from 3000 to 3500, providing a total increase of 3000 hp. over the A models. The B models are completely equipped for combat from the red painted tails and wing tips for easy identification in Arctic areas to retractable, remotely controlled turrets mounting twin 20 mm cannon and in internal hangar for the McDonnell F-85 parasite jet fighter in the forward bomb bay.

Major modifications have been made in the B-36B bomb bay to permit stowing of 86,000 lb. of cargo as a substitute for a bomb load. To get maximum use of the 12,300 cubic ft. available in the bomb bay and facilitate quick handling of cargo Convair has designed and built a four-wheeled cargo truck capable of carrying 14,000 lb. of cargo. Six of these trucks will fit into the bomb bay of each B-36B. All are equipped with coupling for linkage with each other or a tractor. Bomb bay roof supports have been specially strengthened to carry the 86,000 lb. load.

. . . Ground showing of newly-completed B-36s at Carswell Air Force Base and Convair's production line plant across the field.

Through the use of internal hoist equipment and the wheeled cargo trucks, Convair officials expect to be able to unload and load the B-36B without stopping the engines. As a result of increased USAF interest in the cargo carriers Convair has stepped up its production of the trucks from two per week to two a day.

► **Bomb Bay Tanks**—Another bomb bay modification for the B-36B consists of a 3000 gallon gas tank specially developed by Firestone Tire and Rubber Co. of Akron for the B-36. Four of these cells can be carried in the B-36B bomb bays to add 12,000 gal. of fuel to the 21,116 gal. carried in wing tanks. Integral tanks are used for wing fuel with special bullet-proof slabs guarding particularly vulnerable spots. Underside of the wing is made from 75ST aluminum which is supposed to deflect a .50 caliber bullet striking at an angle.

Bomb load of the B-36B can be varied by the use of different racks from 720 hundred pounders to two 42,000 lb. Grand Slam bombs, largest conventional bomb available, and more than one atomic bomb. Maximum bomb load dropped so far has been 72 one thousand pound bombs over the Gulf of Mexico.

► **20 mm Turrets**—The B-36B has an unusually heavy armament with a radar-controlled tail turret firing a 37 mm cannon and two 20 mm cannon. Tail gunner operates entirely by radar from a station below the rear waist gunners.

To reduce drag during the long cruising periods all turrets except those in the nose and tail are retractable. Two twin 20 mm cannon turrets are mounted at the base of the dorsal fin and are controlled from the top rear sighting blisters. A similar pair of twin 20 mm turrets are located in the rear belly and controlled by the lower rear sighting blisters. Another pair of twin 20 mm turrets are located on the top of the fuselage just aft of the cockpit and controlled by the forward sighting blisters. One pair of 20 mm cannon are mounted on the top panel of the bombardier's plexiglas nose.

► **15 Man Crew**—The B-36 is manned by a crew of 15 including three pilots; four navigator-bombardier-radar operators; two flight engineers; two radio operators and four gunners. One engineer is constantly stationed at a rear sighting station to check operation of flaps, gear, propellors and engines since none of these are visible from the cockpit.

Pressurized nose section has three decks with two pilots and the flight engineer on the top level. All engine controls are handled by the engineer. Radio operator is on the second deck with navigators, bombardiers and radar operators in the lower deck which opens onto the plexiglas nose. Three tiers of bunks are located in the pressurized tail section for crew rest during flight.

Convair B-36 Bomber

SPECIFICATION AND PERFORMANCE DATA

Max. Gross Weight	326,000 lb.
Length	163 ft.
Wingspan	230 ft.
Height	46 ft. 7 in.
Engines	6 Pratt and Whitney; pusher-type; 3000 hp. in B-36A, 3500 hp. in B-36B
Max. speed	over 300 mph.
Normal cruising speed	180 mph. (indicated)
Service ceiling	40,000 ft.
Max. range	12,000 mi. with 10,000 lb. of bombs
Takeoff distance	5000 ft. over 50-foot obstacle
Design bomb load	10,000 lb. for 12,000 mi.; 25,000 lb. for 8000 mi.
Max. bomb load	72,000 lb.
Max. cargo load	86,000 lb.
Crew	15, including 4-man relief crew
Fuel capacity	21,116 gal. in wing tanks; 12,000 gal. in bomb bay tanks
Oil capacity	1200 gal.
Landing gear	tricycle (dual-wheel nose gear, 4-wheel truck main gear)
Propellers	6 Curtiss Electric reversible-pitch 3-bladed, 19-foot diameter
Armament	16 20mm cannon and one 37mm cannon.

Pressurized compartments are connected by an 85 ft. tunnel through the bomb bay. Crewmen traverse the tunnel lying on their backs on a four wheel scooter and pulling themselves along on an overhead cable.

▶**Convair Team**—Convair's giant Fort Worth plant now rolling out a B-36B every week is a 13,400 man team headed by D. J. Clow and J. W. Larson, ranking engineers of Convair's Fort Worth division.

Production of the B-36 requires a tremendous parts fabrication section of the Convair plant to produce 68,000 special parts for the big bomber in addition to those made by subcontractors and provided as government furnished equipment. Total of 2000 machine tools and 87,000 production tools are used. Assembly line puts 8500 separate subassemblies into the final version of the plane. The current B-36B line takes up the space formerly used by two Convair B-32 production and assembly lines during the war.

▶**Overlap on B-49**—B-36B production will run well into next fall and overlap the beginning of the Northrop-Convair B-49, eight jet bomber, assembly line. Letter of intent under which Convair will build the Northrop-designed bombers was received at Fort Worth early in October. Plans for the B-36C equipped with tractor instead of pusher engine installations and featuring the Pratt & Whitney VDT engine have been abandoned at least for the present. However any serious deterioration in the international situation would probably mean extension of the present B-36 contract beyond the 95 mark and dusting off the tractor-VDT plans that were expected to add 100 mph. to the six-engine bomber's speed.

Gen. Kenney summed up the USAF attitude toward the B-36 program when he was asked if he thought the B-36 had a future. "I would say that it has a present," Kenney replied. Obviously the USAF will rely on the B-36 until something better comes rolling off the production lines.

Enyart First American Elected FAI President

William R. Enyart, president of Simmonds Aerocessories, Inc., Tarrytown, N. Y., and former NAA president, is the first American to be elected president of the Federation Aeronautique Internationale, 43-year old world governing body of sporting and private aviation. Enyart was elected at the recent FAI conference in Paris, succeeding Lord Brabazon of Tara. Conference accepted, with three dissenting votes out of 26 nations represented, invitation of the U. S. delegation to hold the 1949 FAI conference at Cleveland, Aug. 29, preceding the National Air Races. Dissenting countries were Russia, Poland and Romania.

John J. Ide, former representative of the National Advisory Committee for Aeronautics at the embassy in Paris, was elected FAI vice president from the United States.

NASAO Meets

Joint enforcement move expected as outgrowth of Boston sessions.

By Alexander McSurely

Boston—Conference to coordinate the work of federal and state aviation officials in a vigorous enforcement policy to curtail low, reckless and drunken flying, and renewed efforts for flying safety education will be probably the most important outgrowth of the recent convention of the National Association of State Aviation Officials here.

Delos W. Rentzel, CAA administrator, making his first appearance before the officials from 45 states who were represented at Boston, pledged full CAA cooperation in a federal-state conference and gave the state officials a virtual guarantee that satisfactory coordination would be the result of such a meeting to be held very soon. Cooperation was also indicated by Joseph J. O'Connell, Jr., CAB chairman, in behalf of his agency.

A statistical report on enforcement actions against local violators cited by Rentzel, compared state actions and federal actions in a light favorable to CAA. Challenged by L. L. Schroeder, Minnesota aeronautics director, CAA officials admitted that the figures were not directly comparable, and that the comparison drawn was inaccurate.

▶**New President**—Edward F. Knapp, Vermont aeronautics director, was elected president of NASAO, succeeding Clarence F. Cornish, Indiana aeronautics director. Knapp had served three years as secretary-treasurer before the appointment of Col. A. B. McMullen, as paid executive secretary, a few months ago. McMullen is continued in that position, with office in Washington.

Prof. Lynn Bollinger of Harvard University Business School called upon NASAO and federal agencies for support in developing a more favorable regulatory environment for close-in airstrips for greater utility of personal aircraft, if improved aircraft are provided which can use such small landing facilities safely and quietly. He suggested a new category be developed for aircraft capable of using such facilities.

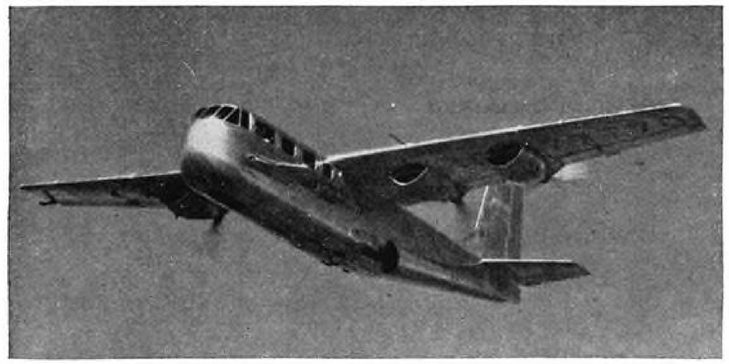
Members of the group watched two quiet airplanes modified by Aeronautical Research Foundation, make low decibel landings and takeoffs at a temporary airstrip on Harvard University campus. Later they passed a resolution recommending additional federal support for the foundation's projects to improve the personal airplane.

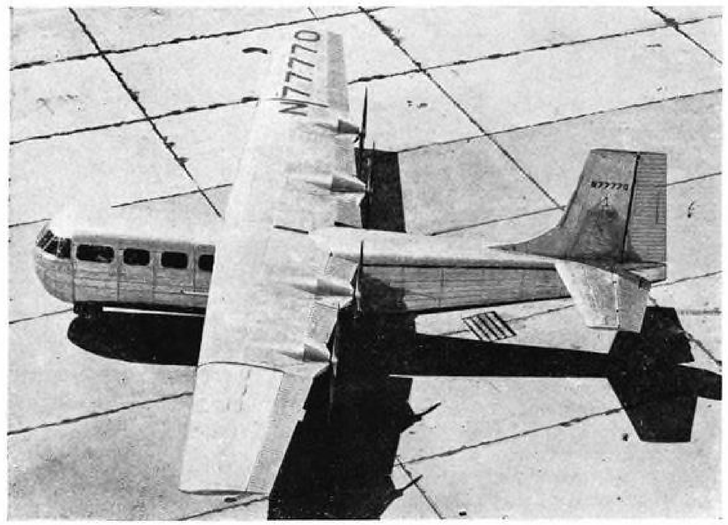
U. S. Senator Owen Brewster (R., Me.) reviewed accomplishments of the Congressional Air Policy Board in the last Congressional sessions and emphasized importance of continued Congressional emphasis on aviation legislation in the future. He urged necessity for action on the commercial transport prototype subsidization which was not completed in the rush of the closing of Congress.

CAB Chairman O'Connell invited state economic regulation of intrastate air operations, which he said the Board was not able to handle. He called for increased cooperation of federal and state governments, pointing out the evils of duplicating and overlapping regulations.

In other resolutions NASAO paid particular attention to airport problems and aviation training. Resolutions called for:

- Increase of Federal Airport Act appropriations to $100,000,000 a year maximum provided under the Act, for the remaining four years.
- Authorization for federal allocations up to 75 percent of costs for Class I airports if individual contribution does not exceed $25,000.
- Amendment of the Airport Act to allow increase of grant agreements if necessary after grant has been accepted, and to accept prevailing wages and prevailing unit contract prices.
- Congressional assistance to communities which have acquired over-sized airports originally built for military purposes, so that they may be properly maintained.
- Development of improved servicing facilities at airports.
- Appropriation of $5,000,000 a year for five years for federal-state airmarking program.
- Use of civilian flight schools coordinated with high schools, colleges and universities, in a national pre-screening, familiarization and indoctrination aviation course for all potential military aircraft trainees.
- Airmail star routes.
- Reasonable maximum rates for customs at borders on weekends, when greatest flow of air traffic takes place.
- NASAO board of directors was instructed to ask Congress for continuation of the GI flight training program and for rewriting of the present law in view of the Veterans Administration's apparent disregard of the mandate of Congress in denying thousands of veterans their lawful right to engage in flight training.





New Four-Engine Lightplane

A four-engine executive-type plane has made its first flight at New Orleans and is believed to be the only plane of its kind ever to fly in this country, and possibly in the world.

Built by Monsted-Vincent Aeronautical, Inc., the craft is powered by four Continental 85-hp. engines driving Sensenich fixed-pitch pusher propellers. Its builders are now constructing a second plane to be used in static testing for a CAA certificate.

▶**Five-Place**—The Monsted-Vincent plane is all metal, carries five including pilot, has a gross weight of 4800 lb. and empty weight of 3200 lb., which its builders hope to cut to 3050. Span is 48 ft. and length 34 ft. At the rear of the cabin is a lavoratory.

Cruising speed it 145 mph. and integral wing tanks in outboard panels (one tank for each engine) hold a total of 172 gal.—enough for eight hours of flying at cruising speed. Present plans call for installation of controllable propellers.

Name of the plane, "Star Flight," fairly well sums up its design considerations, according to Col. Farley Vincent, president, and Robert Monsted, vice president. They told AVIATION WEEK that their aim is to build an executive-personal plane that can be used at night as well as in daylight, and in any kind of weather suitable for an airline transport.

▶**Safety Margin**—They believe a single-engine plane does not have sufficient utility for business purposes. They claim a twin-engine plane is not much better as its single-engine performance leaves a lot to be desired. "But to my knowledge," Vincent says, "there never was a four-engine plane built that wouldn't fly well on three engines."

Monsted-Vincent's plane has insufficient flight time to produce firm results, but Vincent says that on one of the first flights he killed two engines on one side and the plane still flew satisfactorily at 90 mph.

With four engines, each of low horsepower, rather than one power plant of equivalent output, Monsted-Vincent believes it can attain the same margin of safety possessed by transports of a larger size.

Only other four-engine small planes that show up in the records are several built here and abroad to test configurations of larger planes, or for some other experimental purpose.

▶**Costly**—The company, composed of former Air Force personnel and experienced aeronautical engineers, already has spent a considerable sum of money on the Star Flight. Its commercial production still is too far away for any firm price to be set, but at this time it looks like the plane would cost more than the highest-priced single-engine executive plane, although still far below the twin-engine Beechcraft.

Monsted-Vincent occupies part of the former Higgins hangar at Michoud airstrip and has headquarters at 325 N. Hennessy, New Orleans. Designer of the Star Flight is Art Turner, onetime engineer with Lockheed.

Aviation Officials Active in Securities

Substantial trading by insiders of Curtiss-Wright Aircraft Corp. highlighted a series of security trades released recently by the Securities and Exchange Commission.

D. M. Shaeffer purchased 6100 shares of common in six trading days preceding the surprise dividend of $2.00 per share on July 14. On July 13, Shaeffer purchased 3500 shares. The stock appreciated over 50 percent in market value following the dividend announcement.

▶**Additional Shares**—Shaeffer resumed his purchase of common on July 23, acquiring an additional 2400 shares on that and three subsequent days. In April he purchased 3000 shares of the same issue.

He also purchased 500 shares of Curtiss-Wright A stock on July 13, preceding by one day the $1.00 dividend declared on that issue. His total holdings of common aggregated 12,600 shares as of July 31, 1948.

▶**Insiders**—Under SEC regulations, inside trading done on the basis of advance information is not subject to censure. Such holdings, however, must be retained for at least six months; otherwise all trading profits arising from these transactions accrue to the benefit of the company.

A delayed report shows that Julia M. Scanlan purchased 300 shares of Curtiss-Wright common in May, bringing her total holding of this issue to 1000 shares. S. R. Reed also acquired 200 shares of the same stock in April, making his total holdings 300 shares.

▶**Northwest Sales**—Persistent selling of Northwest Airlines common stock was much in evidence. President Croil Hunter sold a total of 4000 shares of common during May and June. The May report shows T. E. Irvine, through a trust account, disposing of 4000 shares of Northwest common, leaving 4000. Another director, Alonzo Petteys, after selling 13,000 shares in January and February, sold 17,175 more in March followed by another 6500 in April, leaving him with only 1500. During February and March, E. I. Whyatt disposed of 3442 shares of common but in its place acquired 1974 shares of preferred.

Sixth National Clinic Meets This Week

Aviation's sixth national Clinic, patterned on the legislative assembly method used last year at Springfield, will get down to serious business Tuesday, Oct. 19, at Detroit.

Working sessions at the Masonic Temple will center attention on opinions of delegates from 14 various classifications of the aviation industry and allied interests, and will seek to crystallize industry sentiment by passing bills of policy expressing these opinions.

▶**New Bills** – Approximately 20 bills of policy already proposed in advance of the sessions included such varied subjects as construction of research facilities, federal-state cooperation in airports, federal aid administered by CAA to develop civil aviation, flight training for ROTC, federal aid for aviation education, endorsement of cross-country private pilot courses, development and procurement of liaison aircraft.

Also that veteran applicants for flight training be required to provide no greater evidence that such courses are vocational than is required of students in other courses, and endorsement of recommendations of the Congressional Air Policy Board.

Clinic officers include Gov. Kim Sigler of Michigan, and NAA President Louis E. Leverone, co-chairmen; Ray Nyemaster, Des Moines, speaker; Robert Ramspeck, ATA executive vice president, legislative consultant; William P. MacCracken, Jr., Washington, legal consultant; Cass Hough, Michigan Aeronautics Commission chairman, and Eugene Fryhoff, Detroit Metropolitan Aviation Authority director, liaison officers; Joseph T. Geuting, Jr., personal Aircraft Council manager, and Robert Dewey, Illinois aeronautics director, clerks; James Votta, executive vice president, Aero Club of Michigan, secretary; R. M. Phelps, NAA executive vice president, director.

After three days of legislative assembly meetings, the Clinic will adjourn Thursday afternoon. Major social events scheduled are a buffet supper and dance at the Book-Cadillac Hotel, Monday night, preceding the opening of the legislative sessions, and the Clinic banquet, Wednesday night at the Masonic Temple.

Unfreeze More Money

U. S. Air Force has taken the first step in unfreezing another $75,000,000 of its fiscal 1949 funds for purchase of additional government furnished equipment and minor modifications on planes already in production.

USAF request to allocate the $75,000,000 was sent to Defense Secretary James V. Forrestal last week as the first move in the now familiar path to final certification by the President. Last previous USAF request for $80,000,000 to purchase 313 new planes (AVIATION WEEK, Sept. 27) was still on the President's desk last week with an additional $16,000,000 for buying guided missiles still stuck in Forrestal's office.

Most of the items included in the $75,000,000 fund will be required by winterization of combat aircraft and additional safety devices. Detailed breakdown of the equipment to be purchased will not be available until the President aproves the USAF request.

Marriott and Kemp In CAA Shift

Joseph S. Marriott and S. A. Kemp were added to the top-bracket Washington CAA executive staff last week, as the step-by-step reorganization of the big federal aviation agency continued. (See AVIATION WEEK, Oct. 11, 1948).

Mariott, who has been sixth region administrator at Los Angeles and is regarded as one of the ablest CAA regional men, becomes director of the office of aviation safety, succeeding Al S. Koch. The latter is now director of a new office of program planning and evaluation. James Reed, deputy sixth region administrator, becomes acting administrator of the region to fill the Marriott vacancy.

▶**Kemp to Washington** – Kemp, who has been deputy second region administrator at Atlanta, steps up to head the newly created office of aviation development, which combines aviation information, aviation education, personal flying promotion and air marking promotion.

With these changes and the previously announced transfer of H. A. Hook, for health reasons, from the post of assistant administrator (director) of airports, to head the airports regional office at Los Angeles, and replacement by his deputy Edgar N. Smith who will serve as acting director, the top CAA assignments are complete.

▶**Lample Transferred**—The transfer of Chris M. Lample, veteran CAA airways official, to the post of eighth region (Alaska) airports administrator, was also announced. Lample has been director of air navigation facilities service, one of the offices which will be affected in the realignment of the airways office. He will supervise construction of and later manage the two big new Alaska airports at Anchorage and Fairbanks, for which $12,500,000 in federal funds was allocated this year.

There are no changes contemplated immediately in the regional administrator posts, except for the Marriott-Reed shift in the sixth region, and the Kemp move. No successor was assigned immediately for Kemp at Atlanta.

▶**Keep Posts**—Likewise unchanged are Frederick B. Lee, deputy administrator; William E. Kline, director of airways; Edward M. Sturhahn, director of business administration; Bennett Griffin, director, Washington National Airport, and Richard E. Elwell, general counsel.

Lower echelon assignments in Washington and in the field are not yet completed. Directors and regional administrators have been asked to submit their recommendations for their division chiefs and subordinate personnel. It is assumed that a large majority of the subordinate officials will remain in their present posts, but the complete detailed picture of CAA's "new look" will not be disclosed probably until mid-November.

Maintenance Strike At AA Unlikely

Threatened action by maintenance employes at LaGuardia Field still hung over American Airlines last week, but chances were good that it would never come off.

Trouble between the airline and Local 501 of the Transport Workers Union (CIO) developed from a recent layoff of 43 employes when the carrier transferred maintenance facilities to Tulsa, Okla. Originally, AA had until Oct. 8 to comply with four demands, but the deadline passed with no action from the union.

▶**Union Demands**—Local 501 asked: voluntary transfer plan; open bids for flight engineers among mechanics; retention of as much maintenance as possible at LaGuardia; and payment of expenses of those who wish to transfer to Tulsa. As an alternative, it asked negotiations on a severance pay plan.

American stated that a strike would violate an agreement with the union that stipulates no strikes before Dec. 31. At midweek, the union seemed inclined against a strike. But if a work stoppage comes off, local president Bernard Murphy claims he has support from other AA stations whose mechanics are TWU members. That would mean a nation-wide strike against American, and possible interruption of service.

Sale to China

State Department last week announced sale of 42 P-47 fighter planes with full military equipment to China in August. The planes were sold for $544,500. Their original cost was $6,781,451.

The department reported sale of 255 engines for C-46 and C-47 cargo planes to China in August for $393,500. This was 10 percent of their original cost.

PRODUCTION

Engineers Detail 1955 Transport

Long-range 50-passenger overseas jet plane to cruise at 530 mph. discussed at Los Angeles SAE meeting.

Manufacturers wondering what comes after the DC-6, Stratocruiser and Constellation have some new thoughts to play with: opinions of the country's top engineers.

At its National Aeronautic meeting in Los Angeles, the Society of Automotive Engineers turned its membership loose on the problem of deciding the appearance of a "long-range overseas transport plane of 1955." For a change, some definite conclusions were voiced:

- Manufacturers could have ready for flight by 1955 a 50-passenger overseas jet transport capable of cruising 3500 miles at 530 mph. at 37,500-ft. altitude.
- It is unlikely that such a high speed plane can be economically operable until the government's $1,100,000,000 all-weather airway program becomes fully implemented in 1963.
- Airlines right now are so deeply involved in economic problems they are unlikely to display more than passive interest in transocean transports other than existing types.

▶**Military Money**—In concluding even that manufacturers could have the jet transport flying by 1955, the engineers anticipated that military contracts would pay for basic engineering costs and production of the initial designs—which then could be adapted for commercial use.

About all the engineers seemed willing to guarantee is that the U. S. industry has the knowledge to build such a plane. Other things considered, it seemed apparent at the meeting that the jet transport era is unlikely to be launched for another 10-15 years.

One thing could change that estimate. If interim developments in the all-weather airways program were spectacularly successful, airlines could reach nearly 100 percent schedule efficiency within five years. That could bring enough revenue to awaken airline interest in jet transports.

None of the airline spokesmen at the SAE gathering could foresee any immediate prospects of that nature.

William Littlewood, American's outspoken chief engineer, said that he thinks airlines will be quite happy with planes they now are getting—at least until they've found out how to make what they have produce a profit.

▶**Future Near**—Engineeringwise, the designing of "SAE Transport No. 1" was a provocative disclosure of the technological proximity of 500 mph. transportation.

Propeller and reciprocating engine designers insisted that their propeller power combinations offered performance flexibility exceeding that of the turbojet. But the consensus was for equipping the 1955 transport with four turbojet power units carried in underwing nacelles.

C. L. Johnson, chief research engineer for Lockheed Aircraft Corp., said that still-classified military engine developments show that by 1955 the turbojet will not have to function at nearly top speed to obtain maximum results in efficiency.

He said the engine probably will function with greatest efficiency at 60 percent power setting. Its overhaul time is expected to be up to 700-1000 hr. and the overhaul cost only 35 to 40 percent of the cost of a reciprocating engine overhaul.

Miles traveled per overhaul will exceed those of reciprocating engines by 25 percent. He said complexity, noise, weight and roughness mitigate against extended use of propeller type propulsion. He questioned the practicability of turboprop combinations on the ground that the propeller weight for gas turbine powerplants will approach the weight of the engine itself.

Douglas engineers were dominant supporters of turbojet power for future long-range transports. They anticipate up to 30 percent reductions in drag through use of turbojet powerplant installations.

▶**Propeller Has Points**—An admittedly strong point of propeller power supporters was their citation of economical reciprocating engine performance over a wide range of altitudes as opposed to optimum jet performance only at high altitudes.

They insist that the propeller-powered transport, with adequate cabin pressure control, can use reverse-pitch braking to effect extremely rapid descent from high altitudes without exceeding airplane speed limits.

None present would anticipate any lessening of the structural complexity of the 1955 transport airframe, but all displayed engineering optimism that the gadgetry in it can be made to function economically and safely in all operating respects.

▶**Fuselage Tanks**—A major change in the high speed transport airframe will be to shift fuel from wings, which will be too thin to hold the quantities of fuel required, to massive integral fuselage tanks. Further, wing structure strengths may have to be moved upward in view of the low damping effect of thin air at high altitudes during the progress of transient stresses.

To SAE's manufacturing engineers the design symposium induced imaginative enthusiasm which was reflected perfectly during one panel session by the suggestion of a "non-inflammable fuel" for the fuselage tanks of the dream plane.

This was suggested by Harold D. Hoekstra, chief engineer, aircraft service office of aviation safety, CAA, who cited tests being conducted in the addition of a fluorine compound to eliminate combustion of otherwise inflammable (hydraulic) fluids, and added: "Is it asking too much that a compound of this kind be blended with aircraft fuel and be removed as it passes into the carburetor or injector by a separator based upon a chemical, physical, or atomic principle? I commend this problem to our researchers."

Final Agreement Sought On Thread Standards

Two American documents on the unified screw thread standard will be presented when representatives of Great Britain, Canada and the U. S. meet at the National Bureau of Standards, Washington, to finalize agreements on common standards for screw threads used on most types of threaded fasteners.

One is the proposed American standard for unified screw threads, prepared by the sectional committee on the standardization and unification of screw threads. This has been adopted by American industry. Second document will present the standard adopted by the interdepartmental screw thread committee, and will represent agreement of government departments most concerned with screw threads.

British Standard Whitworth thread has an angle of 55 deg. while the American National thread has an angle of 60 deg. Previous attempts to standardize at 57½ deg. advanced by a British mission in 1926, was not considered acceptable. Later, both agreed upon an angle of 60 deg.

The National Bureau of Standards meeting is scheduled within the next three months when, officials hope, completion of the standards will be agreed upon.

BRIEFING PRODUCTION NEWS

► **Consolidated Vultee Aircraft Corp.** has received letter of intent authorizing start of work at Fort Worth on B-49A jet bombers under contract with Northrop Aircraft, Inc. Convair also has subcontracted with Boeing for construction of 167 nose fuselage sections for the B-50. Deliveries are to begin next spring.

► **Curtiss-Wright Corp.'s** Columbus airplane plant has received a new Navy order for 800 Mark XII droppable fuel tanks with deliveries to start in December. This brings the plant's total orders for this item to 5800.

► **Sperry Gyroscope Co.,** Great Neck, L. I., has received an order for 1155 klystron tubes from the U. S. Army Signal Corps.

► **Thompson Aircraft Products Co.,** Cleveland, is tooling for production of jet engine turbine blades for both Westinghouse and General Electric engines. The company long has been a major supplier of blades for Allison engine division of General Motors.

► **Glenn L. Martin Co.,** Baltimore, is installing deicing equipment on 14 PBM-5 Mariners of the Coast Guard. Work has been nearly completed on the first four, with modification time running about four or five weeks per plane.

► **Boeing Airplane Co.** has leased additional space in the government-owned plant at Renton, near its main Seattle facility. Boeing now occupies about one-third of the plant and will use the space for development work and storage.

► **Lockheed Aircraft Service,** MacArthur Field, Sayville, L. I., is hiring 300 additional workers to fulfill its contract to recondition C-54s used on the Berlin airlift (AVIATION WEEK, Sept. 27). Total employment is expected to reach 1100.

► **Rohr Aircraft Corp.,** Chula Vista, Calif., has doubled employment since last spring, is now up to 2300 and is expected to reach 3000 next year. Rohr, subcontractor to many of the prime manufacturers on the West Coast, has leased an adjoining plant from the government to take care of its expanding operations.

► **Piasecki Helicopter Corp.,** Morton, Pa., is progressing on mock-ups of its XH-16, C-54-size transport helicopter for the Air Force, and on the HRP-2 for the Navy.

► **Chance Vought Aircraft** division of United Aircraft Corp. has moved 20 percent of the 50 million lb. of equipment it is transferring from Stratford, Conn., to its new home at Dallas. Present plans call for the first production airplane to leave the Dallas plant next March.

► **Jack & Heintz Precision Industries, Inc.,** Cleveland, has opened a new branch office at 409 Hollywood Professional Building, 7046 Hollywood Boulevard, Hollywood 28, Calif. It will be in charge of P. R. Baus.

► **Kaman Aircraft Corp.,** Windsor Locks, Conn., has delivered to the Navy a helicopter rotor and control system, completing one phase of a contract Kaman has held since June, 1947. Navy already has received engineering data on the Kaman system, and the contract specifies further test runs at the National Advisory Committee for Aeronautics, Langley, Va., laboratories.

► **Beech Aircraft Corp.,** Wichita, Kan., has reduced its Bonanza production to one-a-day for the winter months. Production of Model 18 transports has been reduced to 15-a-month. Beech had been producing from three to four Bonanzas daily. Employment has been reduced to 2450. Approximately 1750 Bonanzas have beeen produced to date.

West Coast Holds Majority of Orders

Improved balance between east and west production is shown by a last-minute survey of the airframe industry, but the West Coast's seven major firms still hold 55 percent of all orders allocated up to this time by Air Force and Navy.

During the war the West Coast industry was credited with from 60 to more than 80 percent of national airframe production at various peak periods. It is doubtful that this condition is likely to be repeated in any future production boom.

There is indication that western industry now has become fully equipped for the handling of current orders and a total backlog of $1,449,215,138 (Aircraft Industries Association figure) represented by Boeing, Lockheed, North American, Douglas, Convair, Northrop, and Ryan. The valuation shows a gain of $430,494,000 since Jan. 1. Slightly less than 10 percent of the backlog total is represented in the number of commercial orders.

► **More Space**—The western firms have added 2,628,022 sq. ft. of production space to coast facilities during the past six months and now declare a total of 22,204,640 sq. ft. of plant area, with another 5,971,130 sq. ft. credited to their midwest holdings. Eleven coast plants of the seven companies now employ 82,956 persons; their midwest branches an additional 19,870.

Shortages of materials, parts and equipment have eased on the West Coast, but skilled workers—tool designers, master layout men, draftsmen, mill operators, template makers and plaster pattern makers—still are at a premium and hard to find.

Accident Rate Drops

The accident rate in airframe and aircraft parts plants continued to drop during the second quarter of 1948, according to the Bureau of Labor Statistics. For the first half of the year, the airframe industry injury frequency rate was slightly below last year, while in aircraft parts plants injuries occurred only half as often as they did in the previous year.

In aircraft parts, there have been an average of 6.3 disabling injuries for every million hours worked, compared with 11.1 last year. In airframe, there have been 4.5 injuries, compared with 4.8 last year.

For all manufacturing industries, injuries are occurring at a rate of 13.5 for every million hours worked, thus putting the aircraft industry far ahead of the average.

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With this great background—it's no wonder you'll find the Flying Red Horse on more airports than any other oil company trademark! Over 1,000 important U. S. airfields at strategic locations Coast-to-Coast—put Socony-Vacuum products always within cruising range.

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Small aircraft owners will be glad to know that Mobiloil Aero in lighter grades—White Band, Gray Band and Gold Band—are now in freer supply. Heavier grades of Mobiloil Aero for commercial planes—Red Band and Green Band—are expected to be in freer supply early next year.

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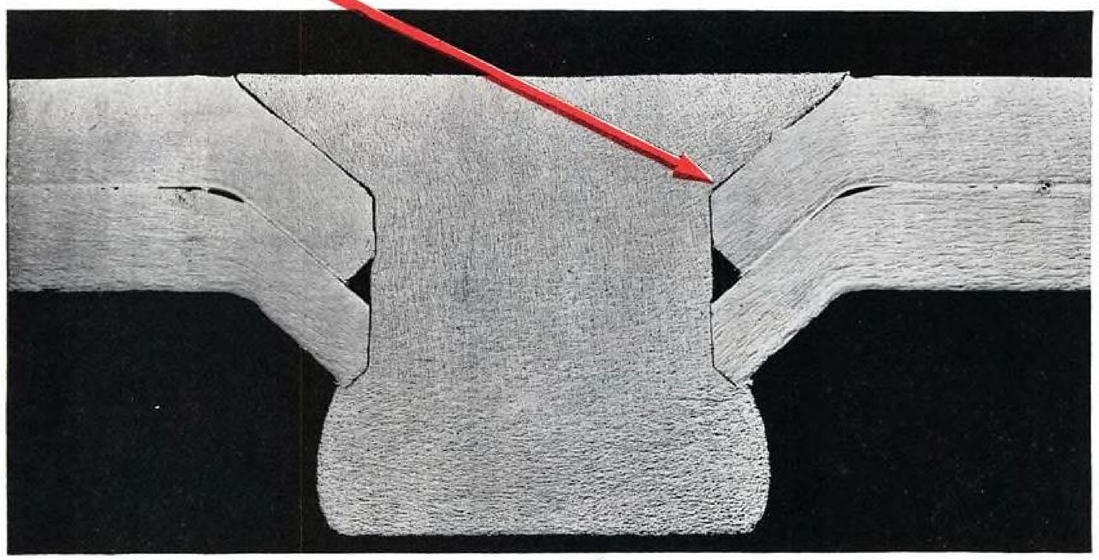
Alcoa research points the way to

BETTER DIMPLING

of Alclad 75S-T6 sheet



Photomicrograph of successful flush-riveted joint between Alclad 75S-T6 sheets.

As soon as aircraft builders undertook the flush riveting of hard, high-strength aluminum alloys such as Alcoa Alclad 75S-T6, it was quickly apparent that tools and methods used for dimpling softer alloys would not be suitable. While new dimpling techniques were being developed by the aircraft industry, Alcoa research attacked the problem from the standpoint of improving the dimpling characteristics of the new alloy itself.

A new interrupted aging treatment, in use on all Alcoa 75S-T6 sheet since the summer of 1945, improves its cold dimpling qualities as compared to the original 24-hour treatment. Research has established, too, that hot dimpling without cracks can be carried out at a temperature low enough to avoid damage to the heat-treatment of the sheet.

Alcoa has supplied this basic information on 75S-T6 to the aircraft industry to aid in the development of suitable tooling and procedures to fit individual needs. Our complete pool of Flight-metal knowledge is at your service. ALUMINUM COMPANY OF AMERICA, 2182 Gulf Bldg., Pittsburgh 19, Pennsylvania. Sales offices in principal cities.

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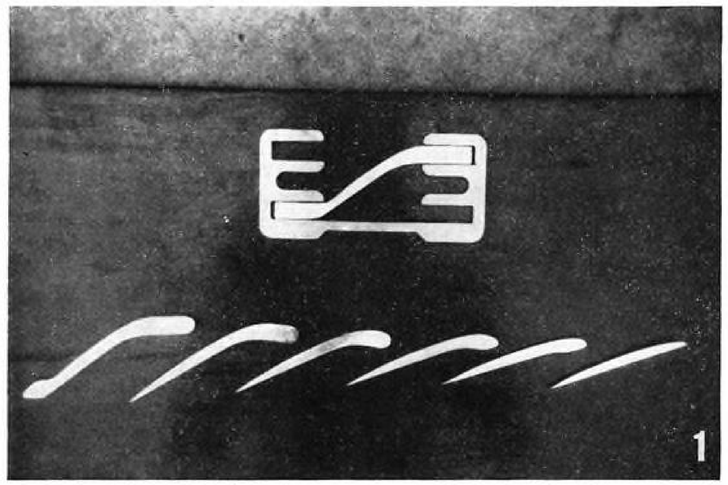
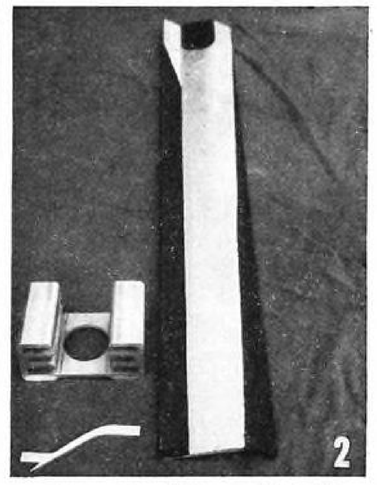
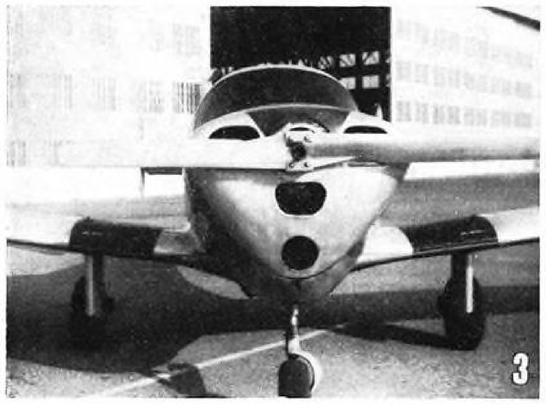


Progressive sections along aluminum alloy propeller blade finished from . . .



. . . this extrusion (black part milled off) . . .



. . . are found in this 70⅜-in.-diameter, two-blade version . . .

. . . and also in this 64⅜-in.-diameter, three-blade arrangement.

Advantages Seen for Extruded Propellers

Thin-sectioned, two- and three-blade, metal airscrews performance-tested in comparison with wooden prop.

New, low-cost, fixed-pitch, aluminum alloy propellers using extruded instead of forged blades and hub show promise of improving lightplane performance.

The two-blade metal propeller weighs but 4 oz. more than the 11-lb. standard wood unit as designed for the Ercoupe. The three-blade metal prop weighs only 13¾ lb.

▶**Blade, Hub Details**—Chord is nearly constant from root to tip, which, in effect, causes greater activity toward the tip. Fig. 1 shows sections taken approximately 6 in. apart, and how the hub and blade root sections fit together.

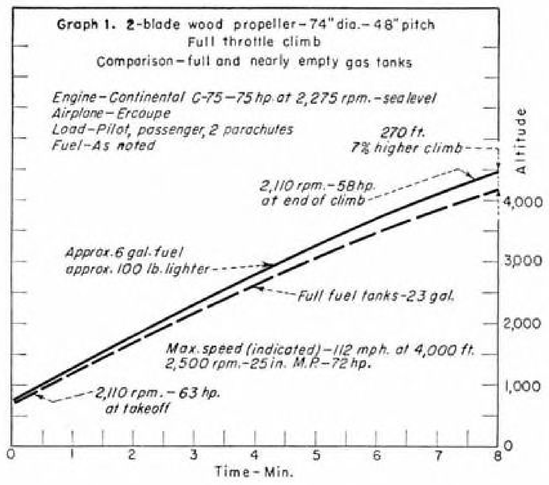
The leading edge is given a "backbone" for stiffness, milled off toward the tip. Fig. 2 depicts the blade as extruded and also shows the hub. The latter is made by merely cutting its extrusion to length and boring the center hole. Bolt holes are drilled on assembly.

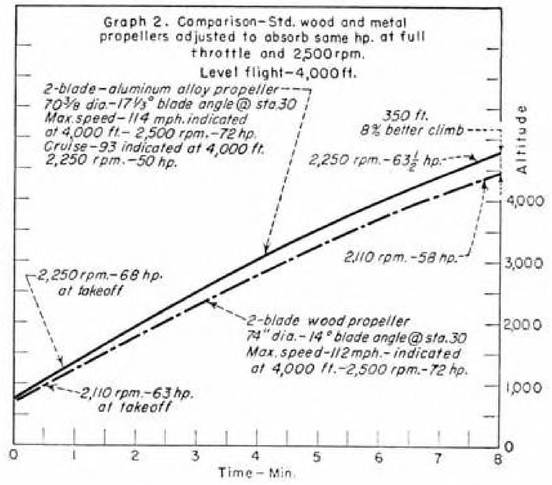
The black area on the blade extrusion indicates the portion milled off.

Figs. 3 and 4 show the finished propellers. The three-blade prop was made from identical extrusions and located with its stations the same distance from the centerline as with the two blader. The tips were then cut back to the required reduced diameter.

▶**Tests Conducted**—A series of flights were made to compare the performance of the two fixed-pitch metal propellers with the standard wood propeller as designed for the Ercoupe powered by the Continental C-75 engine.

All flights were made under carefully controlled conditions, the same flight pattern always being used. Each flight took approximately 20 min. and the succeeding flight was run after about 10 min. of ground time, just long enough





to allow for change of propellers.

Flights were made in the early morning or just before sun-down, to obtain smooth air. Every run with a metal prop was either preceded or followed by a flight with the wood prop, to obtain direct comparisons of performance.

The plane was piloted by F. S. Gebby, and the writer occupied the passenger seat to record data. Parachutes were worn and the total weight of the ship never varied by more than that of the amount of gas required for the 20 min. flight.

A sensitive altimeter was installed and a manifold pressure gage was added so that horsepower could be calculated. Procedure was to make a full throttle climb to 4,000 ft. or slightly higher, ending the climb in even minutes.

All flights were made from Lockheed Air Terminal, the ground altitude being about 750 ft. at point of takeoff. Time started the instant the wheels left the runway.

Readings were taken at 1-min. intervals thereafter. Full throttle level flight runs were made at 4,000 ft. and cruising speeds were at the same altitude as indicated in the data.

▶**Performance Data**—Graph 1 illustrates what happens in climb performance for the wood propeller when the gross weight is varied approximately 100 lb., the difference between full tanks (23 gal.) and nearly empty tanks, (about 6 gal.). The climb is increased 7 percent. This test was made to provide a known basis of comparison.

Graph 2 shows that the two-blade metal propeller (nearly empty tanks) provides an 8 percent increase in climb over the standard two-blade wood prop (nearly empty tanks). This is an increase that exceeds the difference in performance between full and nearly empty fuel tanks for the airplane when equipped with standard wood prop.

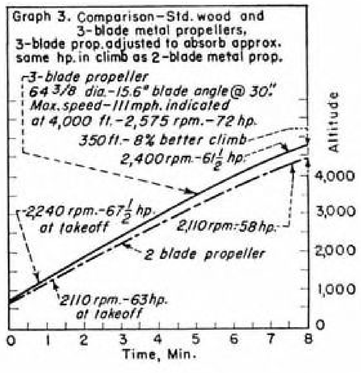
This 8 percent increase in climb remains practically constant when the propellers are also compared with full fuel tanks.

Top speed came out 112 mph. (indicated) at 4,000 ft., 2500 rpm., 72 hp. for the standard wood propeller and 2 mph. faster (114 mph., indicated) same conditions, for the two-blade metal propeller. Note that this much overspeeding at altitude does not quite produce rated sea level horsepower (75 hp. at 2275 rpm.).

▶**Virtual Constant Speed**—The fixed pitch metal propeller provides virtual constant speed operation at nearly rated rpm. for climb and cruising speeds.

Full throttle level flight is of slight importance to civilian pilots and is rarely used. Nearly all flights are primarily climb and cruise when operating under power. Normal glides, of course, are at greatly reduced power.

Graph 2 illustrates that the climb may be made at 2250 rpm. (nearly rated rpm. and engine power at sea level) and that a very satisfactory cruise condition of ¾ power (50 hp.) at 4,000 ft. may be maintained at the same rpm. This provides 93 mph. indicated (which is nearly 100 mph. true airspeed) for the Ercoupe.



The 4,000-ft. altitude is a practical one for most cross-country flights and ¾ rated horsepower is considered a practical cruising power for most lightplanes. If greater power and airspeed are desired at the same rpm. a lower altitude will provide it. An increase in range, lower power and airspeed, occur at the same rpm. at higher altitude.

A constant speed type of variable pitch propeller obviously would have difficulty in justifying itself on a lightplane such as the Ercoupe when compared with the virtually constant speed performance of this simple, low cost, fixed-pitch, metal propeller.

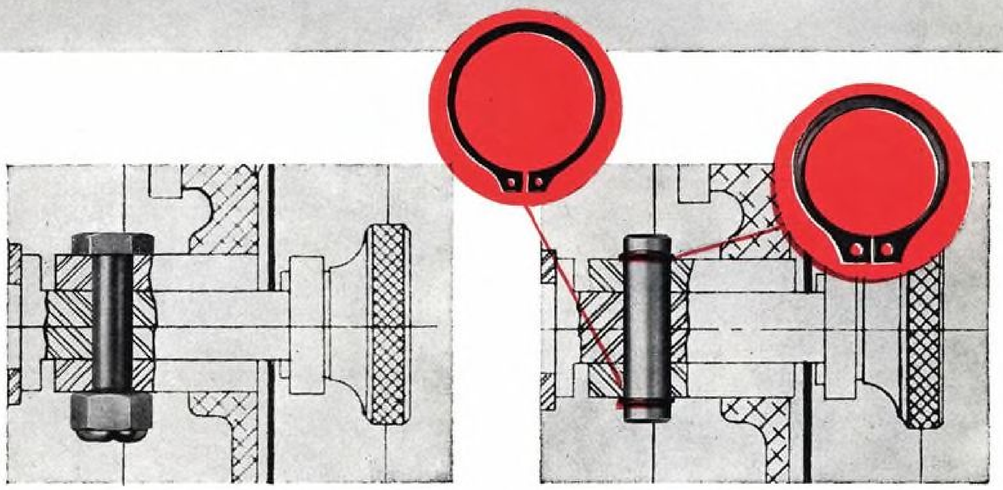
▶**Blade Angle Changed**—The two-blade metal prop was reduced in blade angle from 17½ to 16 deg. at the 30-in. station. This had the following effect, resulting primarily from the increase in horsepower and rpm. that goes with the lower blade angle:

- Climb increased 14½ percent over standard wood propeller. Engine speed in climb was 2330 rpm. This produced 73 hp. at takeoff (750 ft.) and 67 hp. at 4,000 ft.
- Top speed increased 8 mph. to 120 indicated at 4,000 ft. Horsepower and rpm. also increased from 72 hp. at 2500 rpm. to 76½ at 2720.

▶**Performance-Increase Theory** — The metal propeller's working sections are approximately half as thick as the comparable wood prop sections and it operates at higher angles (3½ deg. more).

The thinner sections, operating at higher angles, result in less spread of the rpm. range between climb and top speed. Note that the wood propeller turns 2110 rpm. in a climb and 2500 at top speed, a spread of 390 rpm. The metal propeller turns 2250 rpm. in a climb and 2500 at top speed, a spread of 250 rpm.

Truarc saves 5 minutes, 9 cents in materials per unit without re-design of electric sanders



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NEW WAY

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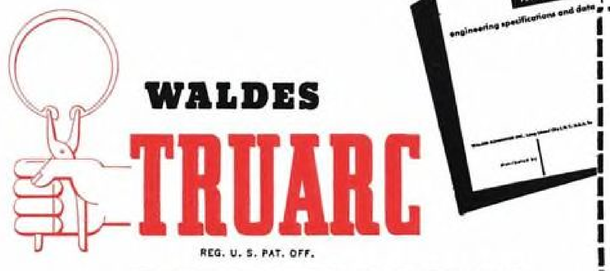

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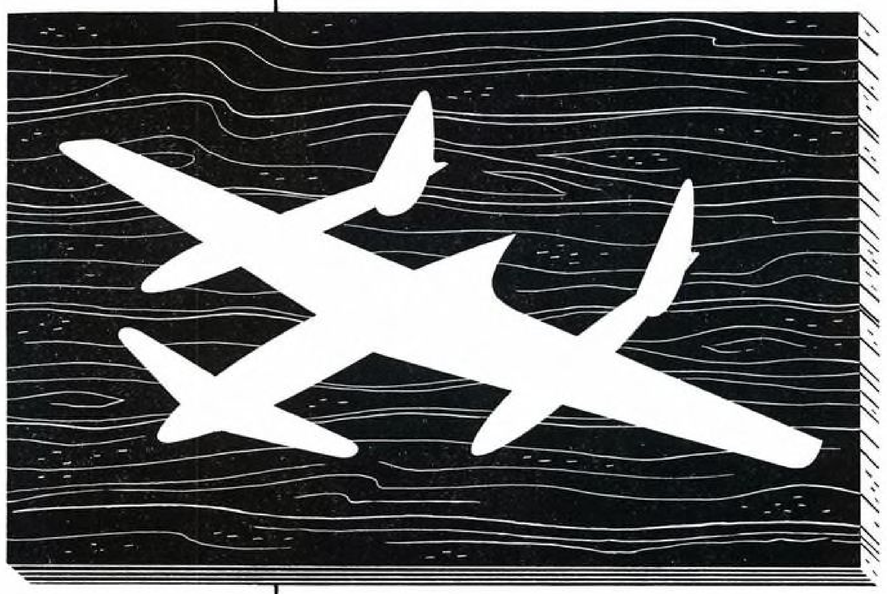
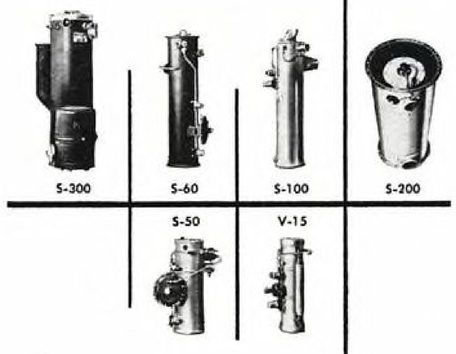
2 APPLICATION
SECOND IN A SERIES OF MESSAGES ON COMBUSTION TYPE HEATERS FOR AIRCRAFT INDUSTRY.

heat the aircraft



before it's off the board



In designing an airplane—whatever its size, shape, or function—consider the heating as early as possible and give yourself the most "degrees of freedom" by selecting combustion heaters from the most complete line: Janitrol. These heaters will function on the ground, as well as in flight, can be installed practically anywhere in the aircraft, and have chalked up records of performance and safety second to none.

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This allows a higher rpm. and thus more power in a climb without exceeding the maximum rpm. at top speed. The increase in horsepower accounts for most of the increase in climb.

When further overspeeding was permitted to increase the hp. to 76½ in the top speed condition it resulted in an increase in top speed of 8 mph. to 120 mph.

Thus any increase in horsepower obtained by increase in rpm. results in an increase in performance for all flight conditions when metal prop is used.

► **Three-Blade Metal vs. Wood**—The three-blade metal propeller was developed because it has these advantages:

• Slightly quieter, because of reduced tip speed brought about by the smaller diameter.

• Operates smoother, as is true for all three-blade props.

• Has minimum diameter, advantageous for operation from rough fields or high grass. Or conversely, the minimum landing gear length may be reduced or the height of the engine may be lowered (for better visibility in a climb). Pusher airplane designs usually can be improved by a reduction in engine height, hence would profit by the use of three blades.

It is realized that a four-blade wood propeller was developed for these same reasons and that the experiment did not indicate complete success. This three-blade metal propeller was expected to fare better because reduction in efficiency would not be as severe.

Also, it was felt that gains resulting from the thinner sections would equal or exceed the losses because of the reduction in diameter.

These expectations proved to be true, since the three-blader does show an improvement in climb over the wood propeller amounting to 8 percent, as shown in Graph 3. Top speed did not show up quite as well, but the loss was not serious. It is felt that further gains will be made.

The angle of attack had to be reduced to 15.6 deg. at the 30-in. station to cause the engine to develop sufficient horsepower and rpm. This is because the total width of the blades is a little too great for the diameter used (the "activity factor" is too high).

Best efficiency can not be obtained until the blade angles are increased slightly to around 16 or 17 deg., the same angles as used for the two blade metal propeller.

To accomplish this without a loss in rpm. in the climb, either the diameter must be reduced further or the chord should be reduced. It is planned to do a bit of both in the near future. Angle of attack, diameter, and total blade width would then be balanced for hp. and rpm. available.—**Walter H. Korff.**

Dives Vary Craft Temperatures

Magnitude of gradients in structural components is disclosed in series of high-speed tests with P-80.

The advent of very high speed—already extending into the supersonic realm—has brought a wide variety of attendant conditions either totally lacking or of insignificant importance in the low speeds associated with aircraft in the past.

One of these phenomena is the creation of thermal stresses by temperature gradients produced during prolonged dives.

► **Altitude Change**—In a dive from 35,000 ft., a fighter plane will move from a region of cold air to a region of comparatively warm air near sea level in as little as one or two minutes. During this brief period of time the airplane structure will undergo an increase in temperature of as much as 125 F.

Although portions of this temperature increment will be dissipated by radiation and other means, a substantial amount of heat will be added to the structure in the process, causing a thermal expansion of the integral parts.

► **Friction Effect**—Another condition through which these temperature gradients can be created—and one of considerable future significance—is the heating effect of air friction at high speeds.

Already this has reached serious proportions in special research airplanes now flying, and its alleviation requires special cockpit refrigeration equipment for pilot comfort. Large changes in airspeeds may produce temperature gradients of serious magnitude.

► **Tests Conducted**—To investigate the extent of such gradients, the Ames Aeronautical Laboratory of the National Advisory Committee for Aeronautics recently conducted a series of high speed dives with a specially-instrumentated Lockheed P-80 jet fighter.

A total of 39 thermocouples was placed throughout the wing structure to provide temperature measurements. In addition, a special integral fuel compartment was built into the wing to provide data on the effects of thermal gradients of structure adjacent to large masses of cold fuel.

A special, 0.046-in. paint coating was applied to the left wing surface to simulate a filler which might be used on future high-speed aircraft to obtain surface smoothness.

Long shallow dives were started at 35,000 ft., pullout was made at 5000 ft., and through use of dive brakes true airspeeds did not exceed 550 mph.

Three vertical rates of descent were used to provide a necessary range of data: 4380, 9000, and 15,500 fpm., requiring 6.8, 3.3 and 2.2 min., respectively.

► **Specific Studies**—Seven combinations were selected for study: skin and stiffener; skin and former; across a rib; spar cap and spar web; fuel and structure of fuel tanks; skin and spar cap; and paint layer and skin.

The tests indicated that maximum temperature difference occurred between the skin and the spar caps, a differential of 30-40 F. being obtained during the dives.

This was as predicted since the thin gage and large surface area of the skin provides good heat transfer, whereas the large mass of the spar caps hinders this dissipation.

Second largest temperature difference during the dives occurred between the fuel and the surrounding structure. Temperature of the fuel remained substantially constant throughout the dive, whereas the temperature of the adjacent structure increased 10-20 F. in the skin.

The dives also indicated the insulating properties of a relatively thick layer of paint on a wing.

Temperature differences between the skin and the paint surface was about 20 F. at the termination of the dive. The tests indicated that both thermal stresses and undesirable high skin temperatures can be alleviated by the use of paint.

► **Magnitude of Stresses**—Effect of temperature gradients on wing stresses is to place the skin panels in spanwise compression and spars in spanwise tension. Approximate magnitude of these stresses may be obtained by assuming that the entire skin area is completely restrained from expansion by the spar cap and that there is no buckling action.

With these assumptions, and letting y_c = spar cap thickness, y_s = skin thickness and f'_r = compression stress in the skin for complete restraint, then:

$$\text{Skin stress, } f_s = \frac{y_c - y_s}{y_c} f'_r$$

and

$$\text{Spar cap stress, } f_c = \frac{y_s}{y_c} f'_r$$

Using these first approximations, NACA determined that maximum compression stress in the skin during the dives reached 6,000 psi., and this maximum occurs at the rear spar cap.

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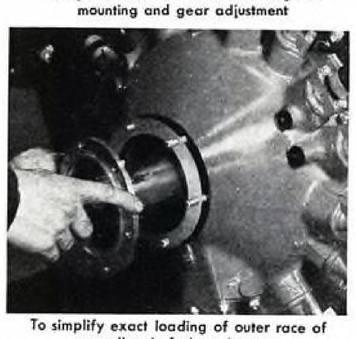
To regulate fit between spider and barrel in prop assembly

Using .002 inch laminations on magneto mounting and gear adjustment

For adjustment of gear meshing in landing gear control machinery



To simplify exact loading of outer race of propeller shaft thrust bearing

1. No precision machining, grinding, filing, miking.
2. All adjustments made *at the job* by simply peeling laminations.
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4. No dirt, oil, grease between shim layers.
5. Harder than stacked or ordinary one-piece shims.
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Send today for chart illustrating 46 money-saving, time-saving applications, detailed specifications, sample of LAMINUM.

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Let us quote on your *difficult* stamping jobs. Our experience, tools and presses are geared for *close tolerance* production.

* LAMINUM (Reg. U. S. Pat. Off.) shims are solidly bonded laminations of .002 or .003 inch precision gauge brass or steel with a microscopic layer of metallic binder. Cut to your exact specifications.

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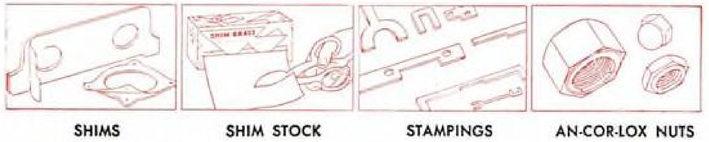
THE SOLID SHIM THAT peels FOR ADJUSTMENT

LAMINATED SHIM COMPANY, Inc.

5110 Union Street Glenbrook, Conn.



SHIMS SHIM STOCK STAMPINGS AN-COR-LOX NUTS

Although this stress is not great enough to prove serious in a plane designed with the high strength factors of the P-80, it is indicative of the substantial loads created in a wing structure by temperature gradients resulting from high-speed dives or rapid changes in speed—loads heretofore ignored in the structural design of aircraft.

With the inevitable rapid increase in aircraft speeds and attainable altitudes in the supersonic regime, it is clear that temperature gradients will have to be taken into account in future designs if its dangers are to be avoided.

Reference

Tendeland, Thorval and Schlaff, Bernard A.: Temperature Gradients in the Wing of a High-Speed Airplane During Dives from High Altitudes. NACA Technical Note No. 1675.

Pesco Research Plant

Borg-Warner Corp.'s Pesco Productions division is building a $2,650,000 production plant and research laboratory where high precision aircraft parts can be developed and manufactured.

Pesco President R. J. Minshall indicated that the plan is to concentrate on aviation accessories "demanded by planes designed for supersonic and near supersonic speeds."

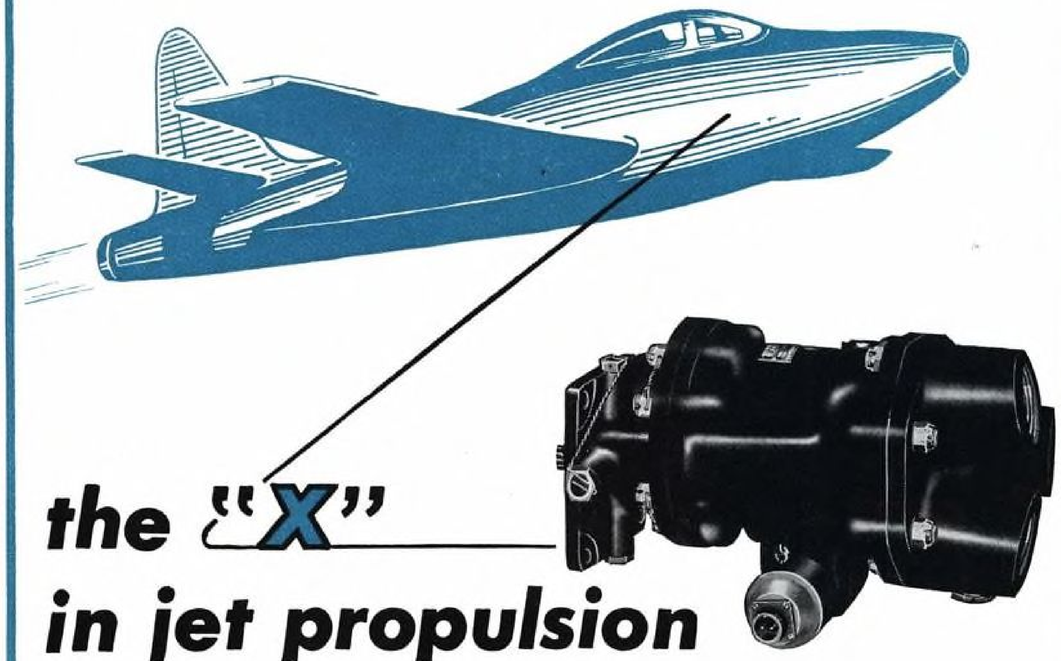
The one-story plant, located on a 35-acre site near Cleveland, is expected to be completed by next May. Building will house a complete metallurgical lab, an electrical lab and a research lab for testing aircraft and industrial hydraulic equipment. A separate laboratory building is under construction for the study of aircraft fuels. It will contain an altitude chamber for observing the operation of aviation equipment under sub-Arctic conditions and at pressures equivalent to 80,000 ft.

There also will be equipment for testing rocket pumps and jet engine fuel pumps under high pressure.

How Much For a Dollar?

Increased complexity of modern fighting planes makes a big difference in the amount of aircraft a procurement dollar will buy, while manpower and material cost increases also have contributed to the high cost of today's air power.

Two billion dollars would have bought quite an air force in 1924 when the services could have gotten one million fighter planes for that amount. The Curtiss P-1 (Navy F6C) cost the respective services just $2000 each and it was a whale of an airplane at that! Or the new procurement would have put a fleet of 100,000 twin-engine Keystone LB-6 bombers in the air in 1928.



the "X" in jet propulsion

Of course, there is no letter "X" in the words "jet propulsion", but, in the development of jet engines, a very big and important "X" was the design of a fuel pump for this service. This was as tough a problem as any ever tackled by Pesco engineers, and here are a few of the reasons why . . .

1. The pump must deliver a barrel of gasoline in 1 1/4 minutes . . . three times the amount previously required.
2. It must pump that amount at as much as 750 lbs. per square inch pressure . . . 15 times the pressure used by American airplane engines during World War II.
3. It must have nearly the same service life as low pressure pumps. This was the real sticker . . . since gasoline has no lubricating qualities, the wear of internal parts increased much more rapidly with higher pressures.

Pesco not only developed a high pressure fuel pump that met all requirements but went a step further in producing a pump with two pumping sections . . . one for the main fuel system and the other for the secondary system which goes into operation automatically . . . just in case.

The success of Pesco's solution to the "X" in jet propulsion is attested by the fact that today every American production jet engine uses a Pesco high pressure fuel pump.

Pesco PRODUCTS DIVISION
BORG-WARNER CORPORATION
11610 Euclid Ave. - Cleveland 6, Ohio
MANUFACTURERS OF SUPERCHARGERS

Reading Aviation Service, Inc. is ideally situated near East-West and North-South airlanes. Convenient to eastern metropolitan centers, yet away from congestion.

When you're looking for a fully equipped

. . . conveniently located airport in the East

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Yes, this alertly managed field of the Reading Aviation Service, Inc. sets a high standard for service and performance. It's a well laid out, perfectly conditioned field. It's completely equipped with the latest maintenance and repair facilities. And it has all the essentials of its Class 4 rating, plus an instrument landing system.

Regardless of the size of your plane you'll find everything you need here in the way of top-notch maintenance and repair service.

And, of course, Reading Aviation Service, Inc. provides top quality Cities Service petroleum products and services.

Cities Service Aviation Gasolenes

Cities Service Koolmotor and Cities Service Aero Motor Oils

Cities Service Cisco Solvent engine cleaner

Cities Service Trojan Aero Greases and aviation specialty lubricants

CITIES SERVICE

AVIATION PRODUCTS

New York • Chicago • In the South: Arkansas Fuel Oil Co.

Pilot Seat Affords Quick, 15G Ejection

Continuation of Air Force experiments on pilot ejection seats has produced a new design capable of developing 15G acceleration in only ¼ sec. And the seat contains arm rests, which reduce the effect of the rapid acceleration on the pilot's spinal column.

Aero Medical Laboratory, Air Materiel Command, began ejection seat experiments shortly after V-E Day, when German development data became available. Experiments were conducted with a 100-ft. ejection tower containing a pair of rails, up which the seat was accelerated.

Although dummies were used for these early tests, humans have been ejected on subsequent occasions, both on the ground and in the air.

With pilot included, the new seat weighs about 300 lb. and is ejected at a speed of about 60 fps. by a 34-in. telescopic gun with a 65-in. stroke.

Experiments in ejection seat techniques have revealed that a pilot can stand an acceleration of 25Gs safely, provided it is sustained only briefly. Extensive accelerations must be limited to about 10-12Gs if harm is to be avoided.

Fuel System Castings Resin Vapor-Sealed

Elimination of porosity in fuel system castings has been successfully demonstrated at the Air Materiel Command's aircraft laboratory plastic shop.

The method, developed by the automotive industry, was applied to a single point aircraft fueling system.

Porosity of components permitted fuel vapor to seep through nozzles, valves and valve seats, fittings, etc. to create a fire hazard. AMC solved the problem by sealing the castings with a polyester resin, a liquid in its natural state, which hardens at 240 F.

Openings of the castings are blocked, and heat is applied to drive out water vapor. Resin is applied to the exterior and the vacuum within the casting pulls the warm fluid into the pores. When the resin hardens, the casting is effectively sealed against seepage.

"Leakproof" Tube

Less maintenance and increased safety is claimed for new tire tube made by Firestone Tire Rubber Co., Akron, Ohio, for military and commercial aircraft. Stated to "hold air four times longer than ordinary tubes," product utilizes special chemical on inside surface to counteract the normal seepage of air through wall.

WHICH DO YOU WANT?

Grand good looks

Cool and comfortable

Attractive colors

Installed 20% faster

Longer lived

Soil resistant

YOU GET THEM ALL WITH BRIDGEPORT UPHOLSTERY FABRICS

Bridgeport Aircraft Upholstery Fabrics are made in a variety of standard colors in original shades and weaves or can be supplied in designs for your exclusive use. Send for sample swatches and complete information today.

Specify Bridgeport Aircraft Upholstery Fabrics ...leading manufacturers & airlines do.

for SEATS BACKS SIDEWALLS HEAD-LININGS

Bridgeport FABRICS, INC.

BRIDGEPORT 1, CONNECTICUT

Est. 1837

RS-40G ASSEMBLY

[Consists of six RS-40G-SA sub-assemblies]

For LOCKHEED "CONSTELLATION"
DOUGLAS AD-1 & AD-2
MARTIN "MARS" (JRM-1)
Using Wright R-3350-C18BB and C18BD Engines

RL-35 ASSEMBLY

[Consists of nine RL-35-SA sub-assemblies]

For LOCKHEED "CONSTELLATION" Using Wright R-3350 A & B Series Engines

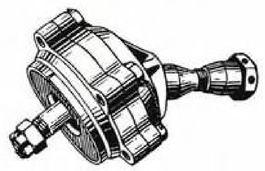
MR-36 and MR-36F ASSEMBLIES

[Consist of six MR-36-SA; six MR-36F-SA sub-assemblies respectively]

For CONSOLIDATED "240"
CURTISS CW-20 (C-46)
DOUGLAS DC-6 (C-112)
MARTIN 202

Using Pratt & Whitney R-2800 A & B Series Engines, use MR-36; Pratt & Whitney R-2800C Series Engines, use MR-36F

DUPLICATE ORIGINAL PERFORMANCE REPLACE WITH LORD DYNAFOCALS



MR-26 ASSEMBLY

[Consists of eight MR-26-SA sub-assemblies]

For DOUGLAS DC-4 (C-54)
Using Pratt & Whitney R-2000 Series Engines

MR-40D ASSEMBLY

[Consists of seven MR-40D-SA sub-assemblies]

For BOEING 377
BOEING B-50
DOUGLAS C-124
MARTIN P4M1
MARTIN AM1
FAIRCHILD C119

Follow the lead of companies like Lockheed, Martin and Douglas who use Lord Dynafocals as original equipment . . . you'll get better vibration isolation, longer service life and lighter weight.

Check these features:

- ***Smoother flight***—flexible center-of-gravity suspension means maximum vibration isolation.
- ***Low weight***—careful design and stress analysis assures minimum weight.
- ***Maximum safety***—all steel parts are 100% Magnafluxed. Metal parts interlock for positive safety.
- ***Less engine movement***—rubber snubbers limit unusual engine movement, prevent metal-to-metal bottoming.
- ***Easy installation***—metal parts are interchangeable due to precision construction methods.

Write for a copy of Lord Service Bulletin containing valuable information on maintenance problems, suggestions for increased service life, and parts list. Mention engine or mounting in which you are interested.

LORD ENGINE MOUNTINGS for DC-3

Item	P & W 1830 Series Quantity Per Plane	P & W 1830 Series Part Number	Wright 1820 Series Quantity Per Plane	Wright 1820 Series Part Number
Tube Mounting	8	J 1202-1	8	H5013-3
Insert	16	J 1789-1	18	SK1925-1
Sandwich	32	SK1292-1	36	SK1292-2

LORD MANUFACTURING COMPANY • ERIE, PA.
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Philadelphia · Chicago · Providence · Burbank
Canadian Representative: Railway & Power Engineering Corp. Ltd.

LORD Vibration Control Systems

INSTRUMENT PANELS

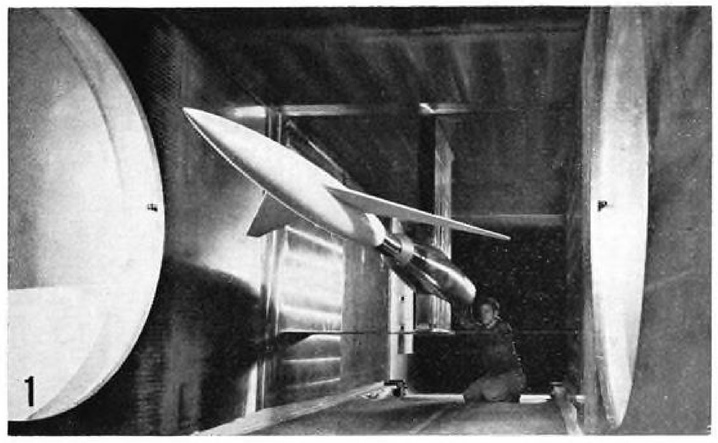
Get all-directional protection with one-piece Multiplane Mounts (see cut) on new jobs. For efficient replacement on earlier installations install Lord Plate Form Mounts.

COWL MOUNTS

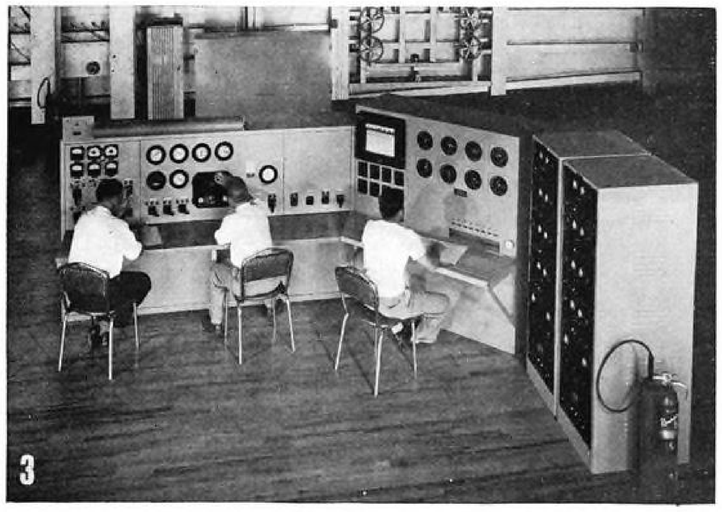
Protect cowls against shock, vibration, and engine expansion with Lord Tube Form Mounts, illustrated. Use these, too, for flap-jack joints—wherever flexible joints are required.

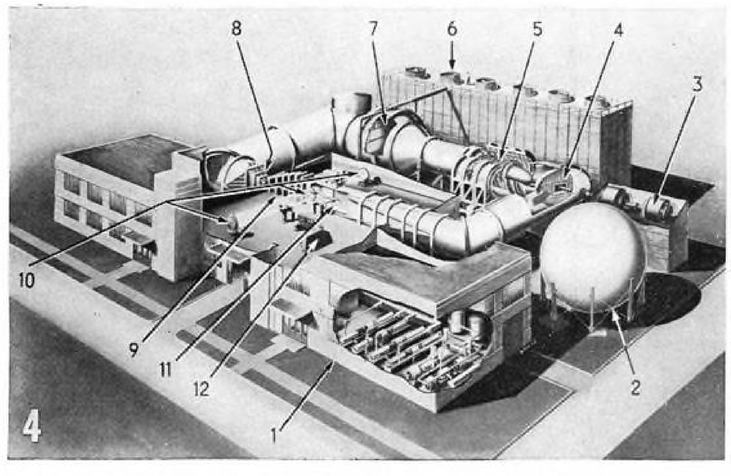
RADIO, NAVIGATION COMMUNICATION EQUIPMENT

Specify Lord Multiplane Mounts for isolation of vibration from all directions. Lord Plate Form Mounts (shown above) also available for replacement.



New Supersonic Tunnel Largest Operating





Markedly raising the research potential of the National Advisory Committee for Aeronautics is the latest major addition to its Ames Aeronautical Laboratory—the largest supersonic tunnel now operating, capable of speeds up to Mach 1.6. A larger (6×8 ft., Mach 2) tunnel at the Cleveland Lab is not yet in operation.

1 Ames tunnel 6×6-ft. test section. Model is supported on sting mount (housing strain gages), affording clear flow by eliminating extraneous turbulence caused by old strut-support method. Horizontal support at man's shoulder has razor-sharp edge. Glass at sides is for schlieren photography.

2 Turning vanes, in large section of tunnel where subsonic condition exists, serves to direct airflow around corner.

3 Control panel console is so designed that tunnel can be operated by three men. The equipment permits regulation of speed of flow and density, and records results of runs.

4 Cutaway aspect of tunnel installation: (1) Density pumps to vary pressure (very high Reynolds numbers can be obtained), (2) reserve accumulator for varying pressure in tunnel, (3) two 25,000-hp., electric-motor drives, (4) turning vanes, (5) axial-flow compressors to provide tunnel airflow, (6) redwood tower in which air is water-cooled before being introduced to tunnel, (7) heat exchanger, (8) contraction section, in which subsonic flow becomes supersonic, (9) adjustable throat permitting variation of supersonic flow speed through movable nozzle block which changes size of tunnel at this point to produce flow of desired Mach number, (10) schlieren photo apparatus, (11) 6×6-ft. test section, and (12) control console.

NEW AVIATION PRODUCTS

Plastic Spray

For water-proofing ignition wires, coils, battery cables, magnetos, etc., and protecting metallic surfaces subject to corrosion, transparent plastic coating, Krylon, is supplied in handy compact container to give fine spray of durable, colorless plastic by button-pressure. Material, made by **Foster & Kester Co., Inc.**, Phila. 32, Pa., dries in less than a minute, leaving clear, smooth, flexible finish that resists high temperature discoloration, water, alcohol, alkalis, acids, grease, and fumes.

Permanent Line-Label

New sleeve for aircraft tubing identification, developed by Glenn L. Martin research engineers, is designed to remain affixed during life of airplane. Made of cellulose acetate butyrate (0.25 in. thick and 1 in. wide), extruded, colored, plastic material has printed information below surface and comes in unsealed rings. For application, sleeves are clipped over tube, overlapping edges are sealed with acetone applied with hypodermic needle, and held in a clamp until the adhesive has set (few minutes). Printed information is not obliterated by contact with hydraulic fluid, high octane gasoline, water, isopropyl alcohol, or by abrasion encountered in operational service. Product is made, under license, by **Topflight Tool Co., Inc.**, York, Penna.

Handy Thickness Gage

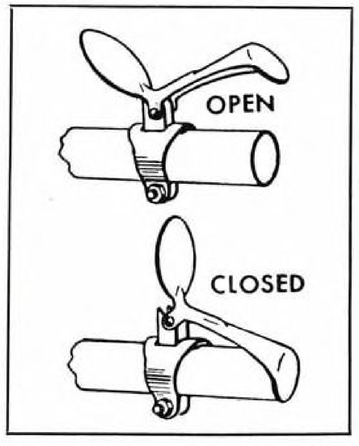
No bigger than a thin pocket watch, dial indicator gage provides easy means of measuring and comparing thicknesses of rubber, sheet metal, plastic, wire, etc. Made by **L. S. Starrett Co.**, Athol, Mass., small hand counts revolutions up to maximum range of $\frac{3}{8}$ in. on dial graduated in .001 in. Spindle is raised by sliding serrated plate at top of gage. Precision made with die cast, chrome-plated case and stainless steel component parts, device shows fractional equivalents on its back. Crystal is non-breakable.

Overhaul Aid

New material, Ramco 3-Up, is marketed by **Ramsey Corp.**, St. Louis, Mo. as a fast-acting cold parts cleaner for removing carbon, gums, dyes, and baked-on grease and oil deposits from metal parts such as carburetors, fuel pumps, hydraulic brake equipment, pistons, valves, blocks, gears, transmissions, etc. Substance is nonflammable and has a special top layer seal to retard evaporation, odors and freezing.

Air Comfort for Baby

To make air travel with infant more convenient, combination safety chair, bassinette, crib and bath, "Air-Nurse," weighing less than 1 lb., is offered by **International Latex Corp.**, 350 5th Ave., New York City. Safety anchors on corners enable fastening to seats, and wide band can be strapped across baby's chest. Device inflates quickly, is airtight and waterproof, and can be carried in small bag when deflated.



Protects Pitot Tube

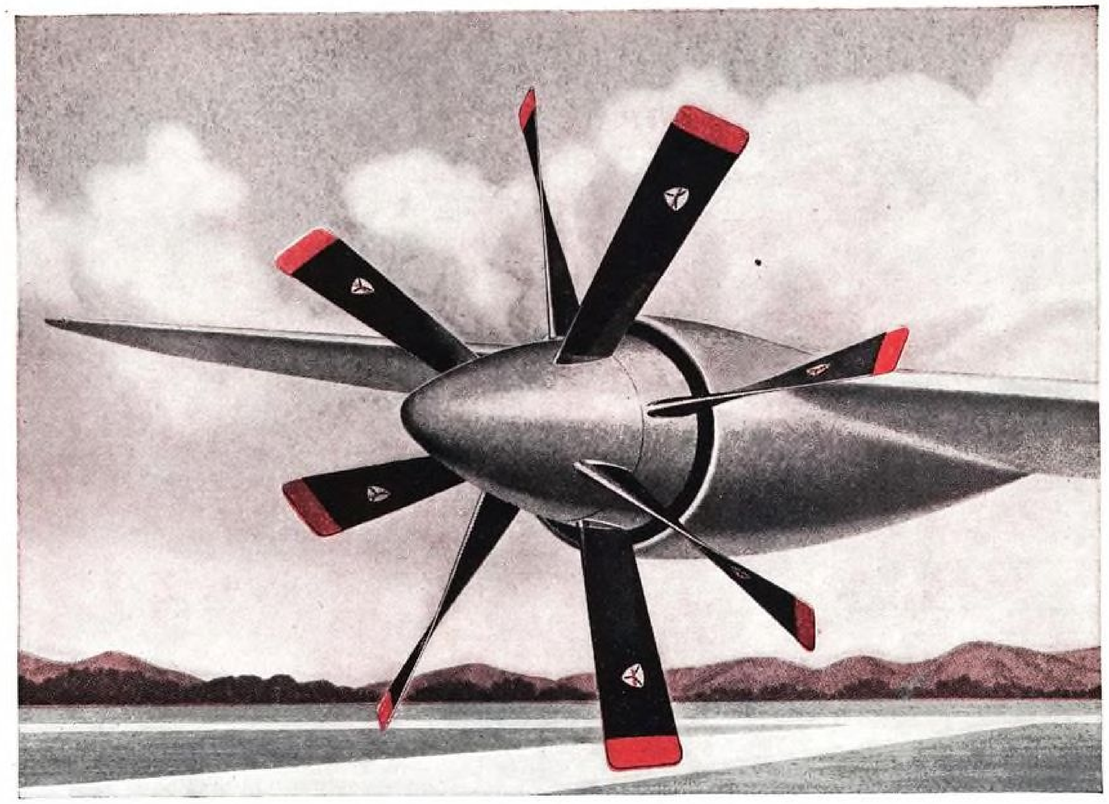
To eliminate need for sack on airspeed pitot tube, protector developed by **Strong's Flight Service**, Pearsall, Tex., opens automatically at 31 mph. and remains open until speed falls below that value. CAA-approved, device weighs $\frac{1}{2}$ oz., is made of heavy nickel-plated brass and is available for tubes from $\frac{3}{16}$ to $\frac{1}{4}$ or $\frac{3}{8}$ to $\frac{1}{2}$ in. o.d.

For Battery Upkeep

Designed for smaller maintenance shops and private aircraft owners, charger made by **Bowers Battery and Spark Plug Co.**, Reading, Pa., handles single 12v. aircraft battery at starting rate of 4 amp. Rheostat permits manual reduction of charging rate to 2 amp. for finishing charge. Unit operates on 115v. a.c., has full-wave selenium rectification. Weight is $5\frac{1}{2}$ lb.

Offset Ratchet Screwdriver

Made by **Aero Tool Co.**, 6930 Avalon Boulevard, Los Angeles 3, Calif., screwdriver is designed to permit application of leverage and reach into areas inaccessible to common drivers. Ratchet permits use in confined spaces and reversing lever makes tool suitable for driving or removing screws. Unit has two blades, for large and small screws. Overall length is $3\frac{7}{8}$ in. Standard device is made for slotted screws only, but is available with special drivers for Reed & Prince, Phillips, and other screws for assembly operations.



Ready to Rise and Fly

The day of the turbo-prop dawns —*a day which Aeroproducts research has been anticipating for many years.* Aeroprop Duals are ready, the logical answer to turbine installations of great horsepower. They are ready with greater power absorption in practical diameters—with minimum weight for large installations—with balanced gyroscopic and torque effects.

Aeroprop Duals have already made their name, using the proven principles that have distinguished all Aeroproducts propellers. Functionally, the unit is unchanged, using the same self-contained hydraulic system, the same hollow hub, the same regulator and governor—all features of added value in Dual construction. The Aeroprop Electronic Control provides the precise speed control so necessary for turbo-prop combinations—with the added safety feature that the integral hydraulic controls continue to function in event of electric power failure.

Aeroprop built the first production Duals, which proved themselves on many applications. Today's Duals—tested, proved and improved through years of research—prove again that tomorrow's aircraft problems can be met today at Aeroproducts.

The Aeroprop is available in single or dual-rotation with instant-feathering, reverse pitch, electric de-icing, and all other features required for any installation. Regulator, hub and blade assemblies are designed for unit installation or replacement. It is strong, light and simple.

Aeroprop

BUILDING PROPELLERS FOR AIRCRAFT TODAY
DESIGNING PROPELLERS TO MEET TOMORROW'S NEEDS

AEROPRODUCTS DIVISION • GENERAL MOTORS CORPORATION • DAYTON, OHIO

.....When you're glad you have a Snap-on

Tightening landing gear bolts with Snap-on Blue-Point BOXOCKETS

Landing...taxiing...taking-off...that's when the landing gear must function perfectly. Important in this mechanism are the landing gear bolts and nuts. To make sure they are tightened to correct maintenance standards, aviation mechanics like to use Snap-on's Blue-Point Boxockets. They like the way the nut-encircling grip distributes the pulling strain equally around the wrench head providing "can't-slip-off-or-spread" factors of safety.

Another feature, contributing to good maintenance workmanship, is the round comfortable, full size hand grip offset from the handle to provide adequate knuckle insurance as well as for working over obstructions.

Snap-on offers 13 different styles of Boxockets with sizes ranging from 3/16" to 4⅝" for a wide variety of work. Snap-on tools are available through a nationwide, direct-to-user tool service.

Photo, Courtesy Mid-Continent Airways

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
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International Division: Kenosha, Wisconsin, U. S. A.

CAA Shifts Affect Private Flying

Shakeup has adverse effect on promotional activities after personal aviation boom fails to materialize.

Personal aviation lost considerable ground at CAA in the recent reorganization.

A recapitulation of what happened in the reshuffle to the agencies and individuals in CAA most closely related to the small plane flyers and the fixed base operators shows:

• H. Lloyd Child, assistant to the administrator for personal flying, has been removed from his spot of direct access to the head man of CAA to a remoter location in the new office of aviation development.

• Dr. Dean Brimhall, assistant to the administrator for research, who has fostered numerous physiological research projects for flyers and been a voice in government acceptance of the stall warning indicator, has apparently been separated from his position.

• Assistants to the regional administrators for personal flying have been abolished and the individuals who held those jobs have been transferred or separated.

• The Nonscheduled Flying Advisory Committee to the administrator, will no longer report directly to the administrator but to an assistant, not yet designated when this was written.

Motivation behind this series of actions may be traced to several things.

The frigid attitude of the personal aircraft manufacturers toward CAA's offer to seek funds to encourage better personal aircraft design development undoubtedly was a contributing factor. Flat turn down of government-sponsored development contracts was obvious indication to Administrator Rentzel that CAA's efforts to promote personal aviation in this way were not welcomed, at least by the manufacturers.

▶ **Personal Aircraft**—Drop of personal aircraft sales to approximately prewar levels, this year, was another indication to CAA that the personal aircraft potential in the immediate future was far less than the rosy predictions at the end of World War II anticipated. It followed that assignment of CAA personnel to promote this branch of aviation was cut back to fit the revised potential.

New emphasis on coordinating civil and military aviation, and increased emphasis on larger airports for national defense airlift and direct military needs, leave less room in the total aviation picture for the small plane flyer, except possibly in the flight training schools. Rentzel, while a small plane pilot, is first of all an airline-trained and sponsored CAA head, who thinks primarily in terms of big planes, big airports, big navigational aids programs.

▶ **Transfer Effects**—Effect of Lloyd Child's transfer is not perhaps as serious as it appears, if the new head of aviation development is sympathetic to personal aviation's needs. Aside from his excellent crosswind gear work Child's main job was as secretary of the Nonscheduled Flying Committee, and he will still have access at least to the administrator's assistant in his secretary's duties.

Separation of Dr. Brimhall is perhaps the most serious loss to personal aviation in the reorganization. Dr. Brimhall's scientific approach to CAA medical examinations brought about a new opportunity for pilots who might never have passed the old physicals. He and John Geisse, another old-time CAA personal flying friend, whose name has not appeared in connection with the reorganization, were most effective in obtaining liberalization of medical requirements for private pilot licenses, and making it possible for the family physician to give the examination.

▶ **Committee** — Nonscheduled Flying Committee has been an active voice for personal aviation since its creation shortly after war's end by T. P. Wright, Rentzel's predecessor. Its usefulness will continue as long as it is an outspoken sounding board for the private flyer, the lightplane maker and the fixed base operator, and as long as it isn't throttled. But whether it will attract the same caliber of members when it no longer directly has the ear of the administration is a question.

In the regions, it has been recommended that if a regional administrator "wishes to continue the functions of aviation training and personal flying assistants they be absorbed in the aviation safety operations branch."

An accompanying note says: "Day-to-day promotion of personal flying is the concern of all CAA employes especially those engaged in aviation safety activities. The phase of this promotion that must be carried out at the level of the regional administrator may be assigned to the assistant to the administrator."

In summary it appears that CAA has not closed the door on personal aviation promotion. Rather it has trimmed its promotional budget in line with the relatively small potential now indicated, and in favor of more pressing immediate needs. Way is still open for active fostering of personal flying by CAA if the persons still charged with its sponsorship are diligent, and if other CAA employes recognize the responsibility cited above.

51,102 Mechanics

A recent Civil Aeronautics Administration tabulation shows 51,102 certificated mechanics and 29,365 certificated flight instructors in the country.

California leads with 8264 mechanics and 3451 flight instructors. New York comes next with 7561 mechanics; Pennsylvania is third with 3538 mechanics. Texas has the second highest number of flight instructors with 2417.

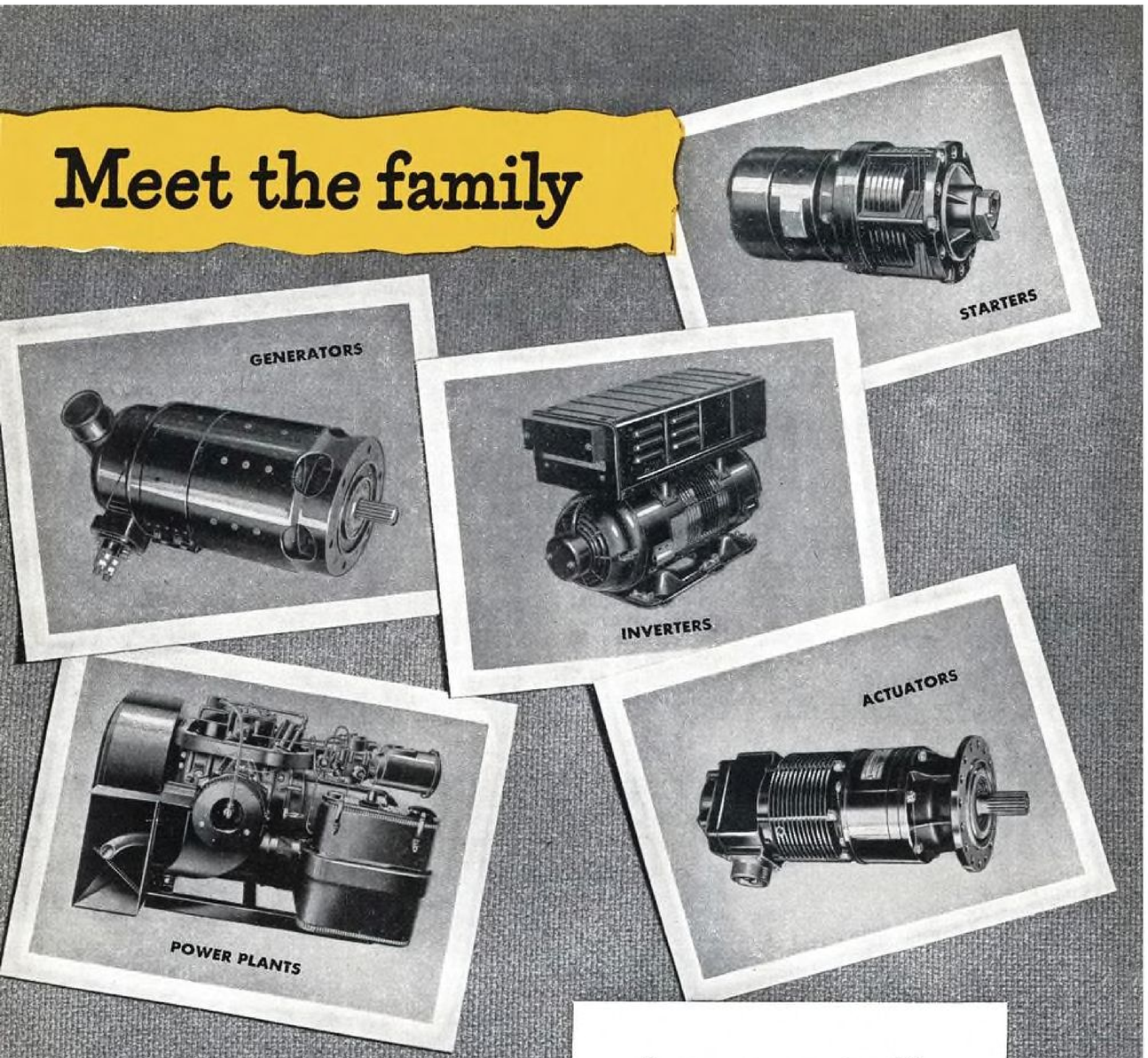
Vermont and Nevada have the fewest mechanics, with 74 and 78 respectively.

Tabulation reflects conditions as of Apr. 1, 1948.

PORTABLE ENGINE

Lightness of the midget powerplant used in the Mooney M-18 one-place plane recently certificated by CAA is shown in this picture of Lewis M. Crosley, executive vice-president of Crosley Motors, holding the 59-lb. Crosley Cobra powerplant. Crosley is now making modifications at Cincinnati to convert the engine, used as powerplant for the midget Crosley auto, into the aircraft powerplant for the M-18.

Meet the family



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Here are the five basic designs of Jack & Heintz aircraft products for power generation and conversion...each proven by years of service... engineered and custom-built to meet *your* requirements.

Write for the new catalog giving complete information on this J & H family of aviation cost-cutters.

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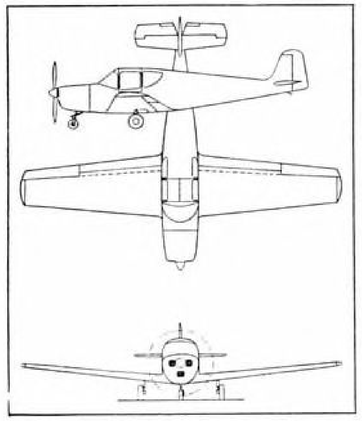

Utility Emphasized In Student's Design

Practical concepts gained in college aviation courses are highlighted by the winning aircraft design, submitted by Raymond R. Duane, in the annual competition conducted by the University of Detroit among its aeronautical engineering students. Sponsor of the contest was Continental Motors Corp.

Intended to meet basic needs of private aviation, this design, the "Ardee," stresses these considerations:

- Utility in passenger and baggage capacity, cruising speed and range.
- Safety in flight characteristics, visibility, and against fire hazards.
- Moderate initial cost and low operating expense.

It is for a low-wing, all-metal craft using a Continental E-185 engine.

With an estimated gross weight of 2600 lb., including four 170-lb. passengers, 110 lb. of baggage, and 40 gal. of fuel, a cruising speed of 150 mph. and range of over 500 mi. are anticipated.

▶ **Canopy Design**—Main fuselage section measures 44 in. wide and 50 in. high at pilot's position. By folding and sliding action canopy could be opened from either side or released as unit for emergency.

Aft fuselage is attached to main section at four points. Empennage is bolted to fuselage as a unit.

Also featured are controllable pitch prop, hydraulic brakes, and exhaust manifold heating system.

For cost considerations, the design anticipates mass production and minimum changes for two or three years.

Wilson Resigns AOPA

Lloyd R. Wilson, Jr., has resigned as assistant general manager of Aircraft Owners & Pilots Association. He has not announced his future plans and his successor has not been named.

BRIEFING FOR DEALERS & DISTRIBUTORS

AIR TOURIST MECCA—State plans to make Wisconsin an air tourist mecca by building approximately 60 to 70 small airstrips alongside lakes in the Wisconsin north country are being pushed by Les Maitland, state aeronautics director.

Recognizing that Wisconsin's second largest industry now is tourists, Maitland is asking the state legislature to provide funds for the airstrip construction. Some of the airstrips will be constructed on abandoned roadways, sections of which can be easily reclaimed to provide lightplane runways.

Maitland said that he contemplates radio bulletins for private flyers from the lakestrips, indicating where the fish are biting and where they aren't. Flying vacationers from southern Wisconsin and other nearby metropolitan centers like Chicago will be able to drop a line in the Wisconsin lakes within a few hours after leaving home. Weekend vacations in the lake country will be feasible when the airstrips are provided.

LITTLE ADVANCE—A report by an NASAO Research and Development Committee at the recent meeting of the state aviation officials concluded that "little basic advance has been made in aerodynamics of civil flying in the past year, although there have been some encouraging refinements in details such as the crosswind landing gear sponsored by CAA, reduction of external noise in small aircraft accomplished by Aeronautical Research Foundation for NACA and structural changes to reduce injury in event of accident, largely brought about by the crash injury research project of Cornell Medical College."

Research committee obtained replies from 22 air carriers, 18 aircraft manufacturers, nine engine manufacturers and four propeller companies on a questionnaire about external aircraft noise, what research is being done to reduce it, what actions states should take. Most air carriers reported that difficulties, expense, added weight and low efficiency resulting from materially reducing external aircraft noise were a serious limiting factor.

State support for the approval of low turns after takeoffs, air navigation facilities to implement anti-noise traffic patterns, and outlawing of "cowboy" pilots with low-flying noisy war surplus aircraft were advocated.

GI CUT HITS W. VA.—Herber Stark, West Virginia aeronautics director says, the throttling of the GI flight training program in his state has caused the foldup of several good fixed base operators. In the hills of West Virginia, he points out, it costs a considerable sum of money, possibly $30,000 or $40,000, to level out sufficient land and build even a small airport.

While the operations which folded were for the most part new enterprises started within the last few years, they did not fall in the class of overnight operators which the VA Washington officials like to generalize about. Stark says his operators were responsible men who invested and lost their own money as a result of the arbitrary action of the Washington and regional VA officials.

UMT VS. FLIGHT TRAINING—A seasoned observer of veterans' affairs in Washington says the real support for the government fight against flight training for veterans comes from the backers of the universal military training program, who are working through the top VA officials. The UMT supporters realize, he says, that every GI who learns to fly becomes aware of the superiority of airpower to UMT, and that the program thus is building up opposition to UMT.

UMT supporters have urged President Truman to stop this "heretical" flight education program which would make America's veterans aware that there is another easier way besides foot soldering to win wars. President Truman who is still a horse artillery man at heart has hearkened to their pleas and passed the word to VA.

There were reports in Washington last week that Gen. Carl Gray, who has stubbornly held the line against relaxing the VA attack on flight training, was considering resigning as VA administrator.

—ALEXANDER McSURELY

FINANCIAL

Airline Ailments Probed for Cure

SAE speaker critical of route duplications; calls for greater individual initiative on part of operators.

Separate ailments of the airlines have attracted public attention to the individual problems they create. Rarely is an attempt made to segregate cause from effect or, more important, to take a penetrating view of fundamental elements to see where they fit in the composite that makes a successful and sound air transport industry.

It is of constructive interest to examine the attempts to go to the root of the industry's difficulties and point up the field for corrective action. It is not necessary to agree with such views. It is enough to focus attention on fundamental issues as a basis of discussion leading to necessary corrective measures.

► **Contribution**—In this light, an important contribution was made by W. L. McMillen, director of economic planning for American Airlines, in his recent talk before the Society of Automotive Engineers in Los Angeles. Speaking as an individual and not as an official of American Airlines, McMillen discussed "Some Economic Problems of the Air Transport Industry."

The concept of competition is given a searching analysis. McMillen holds that the public utility concept in a regulated industry provides for a certificate or franchise. In accepting this certificate, an air carrier gives up many privileges, such as (a) the right to discriminate unduly between individuals, groups, sections of the country, etc.; (b) the right to change prices constantly and violently from day to day; (c) the right to operate when, where, and as it pleases; and (d) the right to withdraw quickly those services it finds unprofitable.

► **Premise**—McMillen continued with the premise that in accepting a certificate, a high price is paid, for the privileges given up are very important in insuring profits. In return, however, freedom from excessive competition and, in some utilities, freedom from all competition are expected. The contention is advanced that the airlines have paid the price but have not received the benefits they should have in return for the surrender of those rights.

"An amazing amount of competition has been permitted and encouraged," the speaker further declared, "with no price exacted. In the case of non-certificated freight carriers, they were even legally given the benefits of operating as scheduled carriers without paying the price and, in the case of passenger carriers, they operated as scheduled carriers in direct violation of the law, and without paying the price. Consequently, the airlines find themselves in the position of operating in a competitive atmosphere almost identical to that of an unregulated industry, yet being deprived of many of the normal competitive weapons."

► **Unsound**—The route duplication created among the certificated lines when three or four carriers fly daily between points where the traffic is sufficient for only two has unquestionably resulted in an unsound condition. An excellent example is the three lines certificated to fly Chicago to Peoria to Springfield, Ill., to St. Louis. There is hardly enough business at Peoria and Springfield for one. On the portion of the route from Peoria to Chicago there are four lines, thus nullifying the profitability of Peoria to each of the carriers involved.

Route duplication throughout the country, instead of developing traffic more rapidly as was expected in some instances, has failed to achieve this objective.

► **Correctives**—The basic premise advanced by McMillen as to unrealistic competition is valid enough, but the ultimate corrective measures do not readily lend themselves to immediate action.

In the first place, in the heated competition for new routes, no carrier appeared before CAB with modest requests all must share some responsibility in the over-duplication of routes which the Board sanctioned. When CAB awarded new routes, it was applauded for its far-seeing vision in taking an optimistic view of the future; when it refused certain route applications, it was condemned for its narrow views. When choosing between two carriers for certain route segments, the successful applicant beamed satisfaction at the Board's wisdom while the losing carrier was far from charitable.

► **Sacrifices**—In re-shaping the airline map, sacrifices by all carriers would be necessary to eliminate excessive route mileage. The general tendency is for each carrier to suggest that the next line give something up while its present route structure remain intact.

The chorus of criticism that greeted the Board's proposed investigation of the advisability of dismantling National is only a small sample of the difficulties encountered in attempting to eliminate certain routes. Only a bold rewriting of the route awards, sanctioned by Congress, appears to have much chance of bringing order to the chaotic route structure of the airlines. And this course appears unlikely.

► **Competition**—The McMillen paper also took exception to the competition afforded by non-certificated carriers in both passenger and freight categories. The major point made here is that "the objective of the Civil Aeronautics Act is a *network* of airlines, not just a cream-skimming operation between a few large cities." Other ailments of the industry such as the artificial support created by constantly increasing subsidy mail payments also are noted.

► **Tone**—There is a positive constructive tone in the conclusions and recommendations advanced in McMillen's 13 point program (AVIATION WEEK, Oct. 11).

The important features revolve around the recognition that there is much that the airlines themselves can do to improve their own lot.

In this connection, it is interesting to note that American's costs have been gradually declining in the face of a general inflationary uptrend. For example, American's costs per available ton mile flown for the twelve months ended July 1, 1946, were 33.7 cents, for twelve months ending July 1, 1948, they were 30.9 cents and they were less than 26 cents in July, 1948. This was accomplished in the face of a 30 percent rise in the price of all commodities during the same period.

► **Composite**—In the forefront of McMillen's package of 13 suggestions, which are proffered as a composite in order to be effective, are recommendations entirely within the initiative of the carriers themselves. This includes further economies by new methods and simplification of present ones. More aggressive and imaginative selling is also suggested along with better performance and regularity. The airlines are called on to initiate and CAB to sanction promotional fares and rates for broadening air travel markets.

It is encouraging to see any program for improving the fortunes of the airlines which places so much importance on individual initiative in the industry rather than on the seemingly easy way out of asking for more hand-outs from the government.

—Selig Altschul

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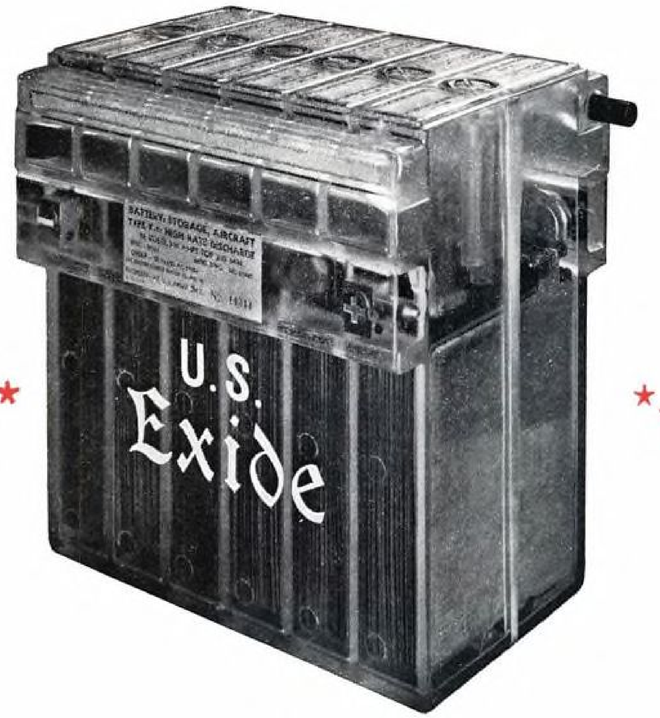

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CAB Insists on Flight Engineers

Board upholds previous order that third crewman be carried after Dec. 1; affects 109 DC-6s.

Acting over the strong protests of the Air Transport Association, the Civil Aeronautics Board has reaffirmed an order which will require six domestic and overseas airlines to use flight engineers as third crewmen in the cockpits of more than 100 DC-6s before the end of the year.

Weighing the prospect of added safety against the sizeable costs involved, the Board declared it is in the public interest to stick by its opinion of last spring with only a few modifications. This ruling (AVIATION WEEK, Apr. 26) provided that after Dec. 1 "an airman holding a flight engineer certificate shall be required solely as a flight engineer on all aircraft certificated for more than 80,000 lb. maximum takeoff weight, and on all other aircraft certificated for more than 30,000 lb. maximum takeoff weight where the Administrator finds that the design of the aircraft used or the type of operation is such as to require engineer personnel."

► **Changes Made**—The new order differs from the original ruling in that it applies only to four-engine aircraft. Also eliminated was the stipulation that the third crewmen be employed "solely as flight engineers." Thus the flight engineer, when required, cannot be assigned simultaneously to other duties for which an airman's certificate is necessary. But a crewman may relieve a pilot for part of a trip and later relieve the flight engineer provided he holds appropriate certificates.

While the DC-6 is the only aircraft immediately affected by CAB's flight engineer rule, the order also applies to the Constellation and the Boeing Stratocruiser. But all Connies already carry flight engineers and are equipped with complete flight engineer stations. The Stratocruisers, which will go into service early next year, will also be equipped for the third man in the cockpit when delivered, although Northwest Airlines originally planned to use two-man crews on some routes. Boeing engineers state that the Stratocruiser is basically a two-man plane, but American Overseas Airlines, United Air Lines and Pan American Airways have always intended to use a three-man crew with the ship.

► **Reasons For Action**—CAB's latest order declares that despite the automatic devices which are installed on such craft as the DC-6, Stratocruiser and Constellation, they have so many items calling for the pilot's attention and are so complex in operation that the pilot's ability to accomplish all his duties may be exceeded if provision is not made for a flight engineer.

"The flight engineer will contribute substantially to reduction of pilot fatigue and resultant accident-provoking sequences," the Board continued. "In particular, the flight engineer can relieve the pilots of burdensome mechanical duties which would be exceptionally onerous if required to be performed when the plane is being flown on instruments, when there are difficult navigational problems, when radio communications are erratic, or when the pilots are attempting to follow complicated traffic control procedures and to accomplish instrument approaches.

► **Added Safety**—"The flight engineer is able to perform important duties and add to safety of flight even when riding in the jump seat of a plane in which no flight engineer station has been provided. In addition, the flight engineer with a specialized engineering training will be useful in case of fire or other malfunctioning, both in overcoming the difficulty and restoring normal functioning, and in relieving the pilots of various mechanical duties, particularly those which would require one of them to leave his pilot's station. The flight engineers also will contribute to the level of safety by assuming responsibility for proper completion of ground maintenance for the correction of any malfunctioning which has been discovered in flight."

American Airlines, which operates the most DC-6s (50), voiced the strongest opposition to the new flight engineer ruling (AVIATION WEEK, July 26). AA asserted flatly that injection of a flight engineer into a crowded cockpit not designed to accommodate him would constitute a hazard to safety.

The carrier emphasized that no DC-6 accident has been traced to the absence of a flight engineer or to an excessive work load on the pilots. It asked CAB and CAA to make a thorough study of the problem before finalizing the flight engineer requirement. The Air Line Pilots Association has been an enthusiastic supporter of the flight engineer regulation and opposed American's request.

► **Other DC-6 Fleets**—Next to American, United's 39-plane DC-6 fleet is the largest. Other carriers using the ships are Braniff, 6; Panagra, 5, and National, 4. Delta Air Lines hopes to have its five DC-6s in service by the end of the year.

To date, United is the only DC-6 operator to announce its plans for carrying out the flight engineer ruling. Approximately 120 students who will be combination pilot-engineers are currently in training at Cheyenne, Wyo.

To qualify as a UAL "second officer," the crewmen are required to have at least 500 hr. of pilot time along with a commercial certificate and instrument rating, a flight engineer's certificate and an aircraft radio operator's license. The Airline Flight Engineers Association (AFL) recently protested United's use of pilots as flight engineers in domestic operations. It contends that mechanics, not pilots, should be trained for flight engineering duties.

► **Extension Possible**—There is some possibility that at least one carrier will not be able to train its third crewmen in time to comply with CAB's Dec. 1 deadline. In this event, an extension will be requested.

Expense of training and using flight

WASHINGTON PREVIEW

Capt. E. V. Rickenbacker, president and general manager of Eastern Air Lines, was host to more than 700 people who attended a Washington preview of the motion picture "Air Power is Peace Power", which traces the development of aviation from the Wright brothers to rockets. John R. Alison (right), assistant secretary of Commerce for aeronautics, was among those greeted by Rickenbacker, who has a feature role in the full-color film.

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engineers, cost of modifying the cockpits of the planes affected and the possible payload loss have figured importantly in the airlines' opposition to the flight engineer requirement. Flight engineers' pay averages around $500 monthly. American, United, Braniff, National, Delta and Panagra probably will require around 327 engineers for their 109 DC-6s. Result: additional expense of almost $2,000,000 annually.

CAB officials and the Air Line Pilots Association claim that additional safety will more than compensate for the extra expense. Only this month TWA was making public relations capital out of the fact that its Constellations had flight engineers. Large TWA newspaper advertisements stated that the presence of "this extra man in the cockpit" is one of the biggest reasons why airline travelers should ride Constellations.

CAB Issues Findings On Three Accidents

Mechanical failures were responsible for two accidents and pilot error probably caused a third mishap on which reports were issued recently by the Civil Aeronautics Board.

The crashes, which resulted in only two fatalities:

▶ **Eagle Air Freight**—Crash of a DC-3 on Mt. Hamilton, near San Jose, Calif., last Mar. 8 was probably caused by the flight's deviation from its clearance and from approved instrument procedure. The crew had been cleared for a straight-in approach to San Francisco Municipal Airport, where the ceiling was 700 ft. and the visibility three miles. The plane hit the mountain 20 miles east-southeast of the Moffett radio range station at an 1800-ft. elevation. There was no evidence of structural failure or mechanical malfunctioning. The two crewmen, only occupants were killed.

▶ **Capital Airlines**—The accident which severely damaged a company DC-3 while on a ferry flight from Norfolk, Va., to Washington, D. C., on May 8, 1947, was probably caused by fatigue failure of one of the articulating rods in the left engine during flight. The two crewmen, only occupants of the craft, were uninjured in the emergency landing in a field near Hartfield, Va.

▶ **Pan American Airways**—The mishap involving a wheels-up landing of a PAA Constellation at Accra Gold Coast, Africa, last Mar. 24, was probably caused by failure of the nose wheel actuating mechanism. Investigators found that extension of the nose wheel gear was restricted by the hydraulic actuating cylinder, whose piston did not extend sufficiently to permit engagement of the lock-down device. No one was injured in the landing, and the plane was not damaged extensively.

Airlines to Lend Pilots to Airlift

With MATS strained to limit, Air Force looks increasingly to carriers for manpower and equipment.

The reservoir of strength provided by U. S. commercial airlines during national emergencies is taking on increasing importance as the Berlin airlift continues to sap the manpower and equipment of the Military Air Transport Service.

Completion of the first 100 days of "Operation Vittles" early this month found MATS less dependent on the airlines for special trans-Atlantic flights which have furnished badly needed logistical support. But at the same time, the Air Force was looking over the commercial carriers' ability to provide pilots—and possibly equipment—for the Berlin airlift itself this winter.

▶ **Pilot Study**—The Air Transport Association last week planned to submit to the Air Force a list of four-engine and two-engine pilots and copilots which its member carriers expect to furlough during the next few months. Since the Air Force's training program has insufficient output of four-engine pilots, MATS hopes to get from the airlines several hundred junior flying personnel who are willing to take active duty during the slack winter traffic season. The men would be permitted to return to their airline jobs next March or April if they wished.

USAF will check ATA's list to determine whether the pilots have Air Force or National Guard commissions and whether they have officer efficiency ratings which warrant a recall to duty. After this study is completed, the total number of eligible men will be checked against the number the Air Force wants to recall.

▶ **Training Program**—Currently, the Air Force is in the market for around 250 pilots and copilots. In addition, it is seeking a number of flight engineers. Acceptable volunteers for Operation Vittles duty will be trained in teams in the new replacement training unit course being conducted by MATS at Great Falls, Mont. (AVIATION WEEK, Oct. 11).

Meanwhile, USAF may ask the airlines for between 30 and 40 DC-4s to bolster the overworked MATS fleet. Some carriers already have offered to sell equipment to the Air Force.

▶ **Nonsked Data**—Up-to-date information on large nonscheduled carriers also is being made available to MATS. Following a conference with MATS officers, the newly organized Independent Air Carrier Association requested all large irregular operators to assemble data on their personnel, facilities, general areas of operation and number and types of equipment. A plan for mobilization of the certificated airlines during an emergency already has been submitted to MATS by the Air Transport Association.

MATS' declining need for special commercial contract flights to transport spare parts, engine replacements and other materiel from the U. S. to Germany is accounted for in part by the trans-Atlantic shuttling of Operation Vittles C-54s which need 1000-hr. overhauls. These craft furnish a large capacity both on the eastbound trip prior to overhaul and on the westbound flight back to Frankfurt. In addition, several Douglas C-74 Globemasters are now available for the trans-Atlantic run; and fast surface vessels are handling some materiel formerly flown overseas.

▶ **Freight Flights**—During the first 100 days of the Berlin airlift, between 175 and 200 freight flights were made from Westover Field, Mass., to Frankfurt by the commercial airlines. These flights of the "MATS auxiliary" were handled by three certificated carriers—Pan American Airways, American Overseas Airlines and TWA—and three uncertificated operators—Seaboard & Western Airlines, Alaska Airlines and Transocean Air Lines (AVIATION WEEK, Sept. 20).

While commercial freight flights for MATS have fallen off, Pan American and AOA are still at work carrying some 4000 military dependents and civilian personnel back from Frankfurt to New York. The two lines also have been transporting about 1600 Air Force personnel to Germany. A continued shortage of passenger vessels in the North Atlantic is responsible for the air movement.

On the Frankfurt-Berlin run itself, American Overseas Airlines flew 4,670,000 lb. of cargo and mail and 10,464 passengers during the first 100 days of the German capital's ground blockade. Only U. S. commercial airline certificated into Berlin, AOA carried 2,000,000 lb. of cargo and 4880 passengers into and out of the city during September alone.

▶ **British Record**—Great Britain's civil airlift into Berlin—organized by British European Airways' charter section—has more than doubled its carrying capacity since it began operations Aug. 5. The original fleet of 14 aircraft has grown to 28 planes provided by 17 different carriers, most of whom have double crews to keep up a steady and efficient day and night activity.

Another 13 planes already chartered by BEA will bring total British civil aircraft in the Berlin corridor to 41. This figure may be doubled again by the end of October. Through Sept. 25, British commercial aircraft flew 8,500,000 lb. of food, 1660 tons of coal and 493,500 gal. of gasoline into Berlin.

RENO BOOSTS THE AIRLINES

Perhaps the most extensive outdoor advertising program to promote tourist air travel ever attempted to a community has been launched by the Reno, Nev., Chamber of Commerce. Some 76 highway signs in full color are being located in the far west near sources of Reno tourist traffic. The signs are designed primarily to encourage short weekend trips to "the biggest little city in the world" by people who do not have time to drive or travel by rail or bus. Located in the San Francisco, Los Angeles, Sacramento and Las Vegas areas, the signs show the flight time in minutes to Reno from the nearest airport. The Reno publicity program was inaugurated at a time when the airlines themselves are making record advertising outlays. Eastern Air Lines, for example, plans to increase its advertising budget more than 25 percent in the next seven months, compared to the same period last year.

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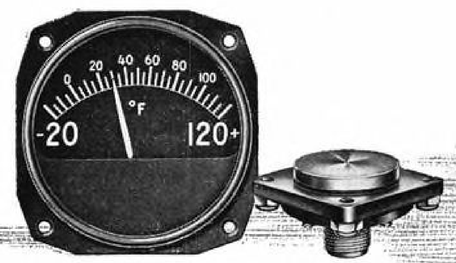

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Stock Sale

Coulter announces plan to dispose of entire holdings in WAL.

William A. Coulter, major stockholder and former president of Western Air Lines, has indicated his intention of disposing of his entire holdings in the airline, by filing a registration statement with the Securities and Exchange Commission.

Slated for sale are Coulter's holdings of 215,597 shares or 41.1 percent of the total 525,164 common shares of stock outstanding. More than a year ago, such holding aggregated 240,210 shares or 45.7 percent of the total capitalization, 24,613 shares having been sold by Coulter in the interim.

► **Surprise**—It is now Coulter's intention to sell his shares on the stock exchange from time to time as he sees fit at such prices as he deems satisfactory. This action caused considerable surprise in financial circles as Coulter's procedure automatically serves to place pressure on the market indicating to all concerned that a large block of Western Air Lines stock is for sale. It is known that a few investment bankers were entertaining the idea of purchasing privately the entire block at a price slightly below the market. Experienced observers are known to believe that such a private placement would have netted Coulter a far larger price.

The registration statement serves to disclose pertinent details concerning Western's current operations and immediate outlook.

► **Assets**—As of June 30, 1948, current assets totaled $1,960,000 as compared with current liabilities of $2,525,000, leaving a working capital deficiency of $565,000. However, the current liabilities included $910,000 due the Reconstruction Finance Corp. during the first half of 1949.

As of Aug. 31, 1948, the company had drawn down $909,187 from the authorized $2,300,000 credit made available by the RFC for the specific purpose of financing the purchase of ten Convair-Liners. In addition to such loan, the company was indebted to the RFC for about $3,800,000 on an advance incurred last year for refunding previous obligations.

► **Estimates**—Based on present estimates of operating results, the company anticipates that before the end of 1948 its cash position may be reduced to such an extent that the company may be unable to meet certain obligations unless cash is received through an award of retroactive mail pay. Further, Western has the problem of meeting maturities aggregating $5,050,000 due the RFC during 1949 and 1950.

Excluding any consideration of retroactive mail pay, Western projects a 1948 net loss from $1,200,000 to $1,600,000 after allowing for a tax carryback credit. Without such tax credit, the current year's net loss is estimated at between $1,700,000 and $2,100,000.

► **Lease Space**—The company notes that its new hangar facility at Los Angeles, completed at a cost of about $2,500,000, was designed for larger operations than those currently being conducted by the company and that space will be leased to others if advantageous terms can be arranged.

The company's current passenger equipment fleet consists of twelve DC-3s (including three leased from the government), five DC-4s and three Convair-Liners. As the ten Convair-Liners are placed in service, it is the intention of the company to retire all DC-4s and several DC-3s. All aircraft equipment and other properties owned by the company are subject to the chattel mortgage held by the RFC securing its loans to the company.

PAA Coach Service Packs 'Em In

Pan American Airways low-cost fare to Puerto Rico is drawing a 95-100 percent load factor on weekend southbound trips and averaging 90 percent on daily northbound trips as the carrier rounds out the first month of its coach operation.

Lowest load factor is recorded on weekday southbound trips, when the 63-passenger DC-4s run 60 percent. Meals and extras are eliminated on the flights (AVIATION WEEK, Sept. 13), which cost $75 one way, or about 4.6 cents a mile.

Travel agents will still generate traffic and sell tickets in New York's Harlem district, and Pan American has been looking for a spot from which to provide limousine service direct to LaGuardia from Harlem.

Original plans by the carrier called for adding Constellations to the route if there was enough traffic, but Pan American has taken no such steps as yet.

Meanwhile, Puerto Ricans, as well as American tourists (see picture above), are making the 1612-mile flight in nine hours—at reputedly the lowest long distance fare offered on any scheduled airline.

Empire Schedules Change

Adjustments in Empire Airlines flight schedules effective Oct. 5 have been put into effect by the Boise traffic office. Purpose is to provide direct connections to Salt Lake City and California points, the Pacific Northwest and Montana.

An evening flight has been added to provide through connections with Western Air Lines to Montana cities. New schedules will remain in effect with minor changes until spring.

Alaska Sales Manager

Louis A. Delebecque has been appointed Alaska sales manager for Pacific Northern Airlines, according to Harold Olsen, general traffic manager. A veteran in Alaska aviation, Delebecque will have his headquarters in Anchorage.

UAL Objects

Competitor protests to CAB about Capital plan for sky-coach service.

A strong protest by United Air Lines against Capital Airlines' proposed new low-cost sky-coach service between New York and Chicago highlighted the still turbulent passenger fare picture last week.

A competitor of Capital's on the New York-Chicago run, UAL complained to CAB that the four cents a mile sky-coach rates are "unjust, unreasonable, unduly preferential and discriminatory." United said the proposal would seriously affect the level of rates instituted by other carriers.

►**Inauguration Postponed**—Even before the United protest, CAB refused to permit the sky-coach tariff to go into effect with less than the usual 30 days' notice. Capital had hoped to start sky-coach service on Oct. 15, but the inauguration date probably will be postponed until the middle of next month at least.

Meanwhile, more fare raises and cuts were announced by other carriers as they adjusted tariffs to meet competition and improve winter business.

TWA announced that effective next month it would offer 15 percent domestic fare reductions on 30-day limit roundtrips made in twin-engine type aircraft.

The excursion rates will remain until next May.

►**TWA Reductions**—In addition, TWA will file a family fare plan similar to the one adopted by American Airlines and others. Under the TWA family fare setup, one regular-price ticket purchased by an adult permits the husband or wife of the full-rate passenger and children less than 21 years old to travel at half price on Mondays, Tuesdays and Wednesdays.

When the new tariffs are in effect, TWA passengers can obtain a 30-day roundtrip New York-Chicago ticket for $75 on DC-3 flights. Travel by four-engine Boeing Stratoliner between the same points costs $44.10 one way. On premium fare Constellations, a one-way New York-Chicago ticket currently costs $47.95.

Capital's proposed one-way sky-coach rate is $29.60.

TWA's latest bargain fares supplement previously announced reductions of 5 percent on roundtrips having more than a 30-day return limit and a cut of 20 percent for groups of ten or more persons.

►**EAL Fares Up**—Coincident with TWA's action, Eastern Air Lines and Delta Air Lines asked and received CAB permission to raise most of their passenger fares around 10 percent, effective Oct. 15. The two carriers will offer 5 percent discounts on roundtrip tickets, making this practice virtually industry-wide.

Like TWA, Eastern will keep its surcharge on Constellations. EAL originally had planned to boost its rates 10 percent across the board last month (AVIATION WEEK, Sept. 27) but postponed the move until the fare picture became less confused.

Northwest Airlines and Pan American Airways also filed new tariffs this month. NWA cut cargo and passenger rates from Seattle to Anchorage, Alaska, to raise the winter traffic level. PAA, which previously slashed rates on its Alaskan run, has announced that effective Nov. 1 the sleeper fare surcharge between New York and London will be reduced from $100 to $25.

LaGuardia Dike

LaGuardia Field, New York, is laid out partially on land reclaimed from Flushing Bay. Every fall, for four years, the bay has been trying hard to get back its own, autumn tides and high northeast winds covering the field with water almost up to the hangars.

Two weeks ago the first of this year's autumnal nor'easters ripped across LaGuardia—and the field kept its feet dry. The Port of New York Authority, operator of the field, proudly announced that a million-dollar dike it has built is keeping the bay off the field. The dike is 28 ft. wide and ranges up to six feet in height. It is completed at critically low parts of the airport and half finished at other parts.

PILOTS HONORED

Two veteran United Air Lines captains, C. C. Coppin, left, and A. C. (Ace) Ball, have amassed nearly 19,000 hr. in the air—the equivalent of more than 3,500,000 miles. They are shown being presented with diamond-studded gold service pins by W. A. Patterson, UAL president, upon reaching their 20th anniversary of flying with the company. Captain Ball has logged more than 11,000 hr. with United, while Captain Coppin, who learned to fly with the U. S. Army Air Corps in 1923, has over 8000 hr. with the company.

Asks New Routes To Serve Oil Towns

Challenger Airlines Co., feeder operating in the Mountain States, may benefit by the present oil-boom in Utah, Colorado and Wyoming.

Discussing company prospects for the coming year, Challenger President Donald A. Duff reported the line expects a profit of approximately $97,000 in the year ending Sept. 1, 1949—partly contingent on CAB approval of Challenger applications to serve communities with new oil fields.

►**New Well**—Challenger is seeking authorization for scheduled flights to Vernal, Utah, where a new well was brought in last month. The route would also serve the Rangely, Colo., oil district just over the state line. Challenger also wants to route planes to Casper, Wyo., a growing oil center. Such extensions would add an estimated $44,000 to the line's earnings, Duff said.

CAB has been informed that Challenger would issue an additional 400,000 shares of $1 par value common stock to finance the route between the Wyoming and Colorado towns and Salt Lake City.

An airport at Vernal is expected to be completed for Challenger flights in ample time for the carrier to receive CAB approval.

Union Disaffiliates

The Airline Communication Employes Association, claiming 1500 members on eight major airlines, has decided to drop its affiliation with the American Communications Association, CIO.

Disaffiliation was voted unanimously by the executive board of ACA's airline branch, climaxing a growing disagreement over the left-wing policies of ACA leaders. Whether the airline members will remain in the CIO is uncertain. CIO policy does not permit switching from one CIO union to another or affiliating separately with the CIO, but enforcement of this rule has not been effective in recent years.

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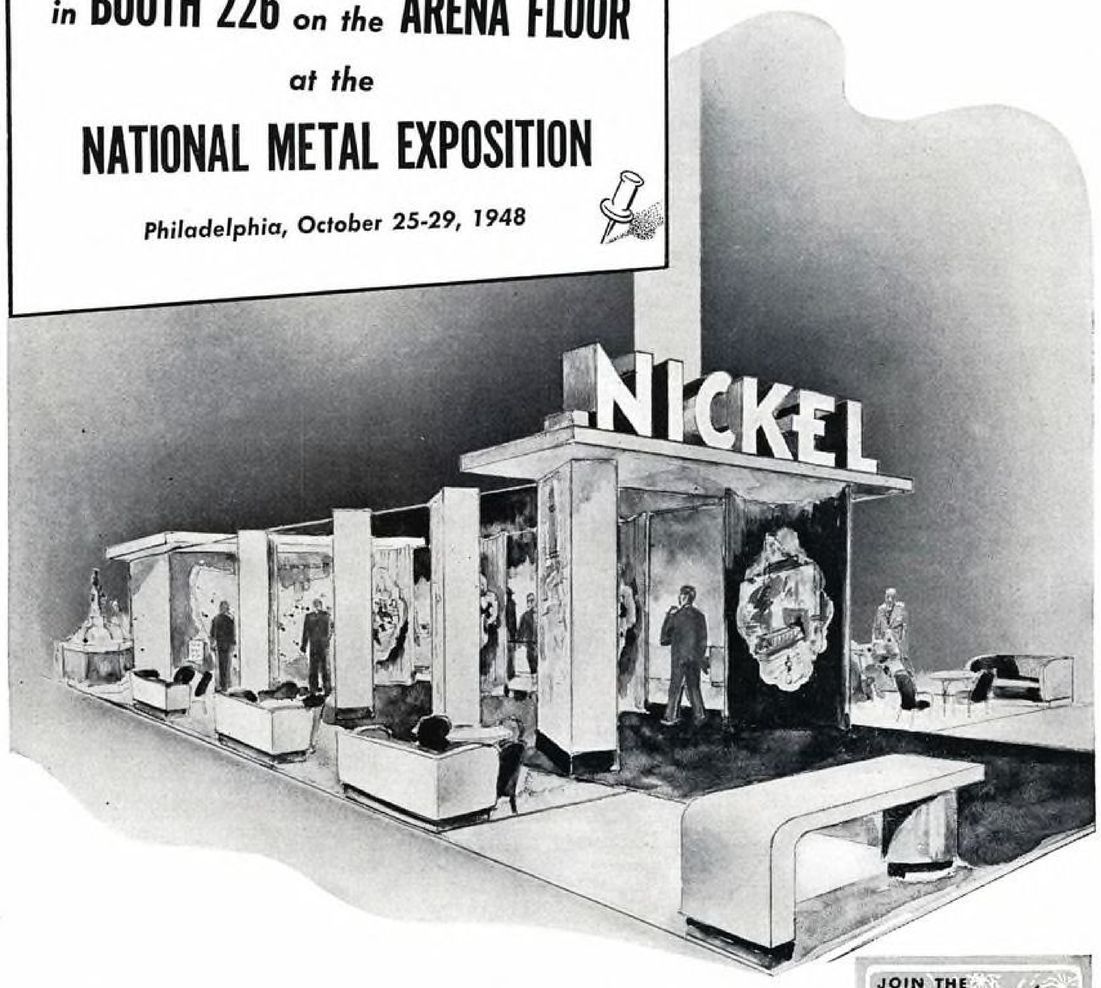

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CAB Policy Protested By Airfreight Group

A revitalized Air Freight Forwarder Association is challenging the Civil Aeronautics Board's recent finding that losses incurred by the certificated airlines in cargo operations "must be underwritten by mail pay to the same extent that passenger operations must be underwritten."

The Board's policy, which is also causing concern in the Post Office Department, was set down for the first time in the recent Braniff Airways and Delta Air Lines mail rate opinions (AVIATION WEEK, Sept. 27). At the same time, CAB made clear that deficits sustained through establishment of uneconomic freight rates, or through operation of capacity in excess or reasonable requirements, will not be recognized for mail rate purposes.

▶ **Foe of Forwarders**—AFFA told CAB that in the past the certificated airlines have generally opposed authorization of airfreight forwarders and have adopted tariffs designed to make it impossible for forwarders to operate. "The record in the airfreight rate case illustrates the inability and unwillingness of the certified carriers to support sound freight rate making by offering the volume breaks necessary to intelligent cargo tariffs and to the success of the airfreight forwarder experiment," AFFA declared.

"This reluctance to accept the realities of cargo rate making has not been true of the noncertificated cargo carriers. But in the event that freight losses are to be underwritten by mail pay, cargo operations by carriers other than those handling mail may prove to be economically impossible.

"The certificated carriers have created Air Cargo, Inc., for the express purpose of preempting to themselves the responsibilities normally assumed by forwarders. Thus subsidizing cargo losses represents in a sense the subsidization of the certificated carriers' own freight forwarder, placing that forwarder in the strongest competitive position."

▶ **Experiment Jeopardized**—AFFA said continuance of such a practice will nullify the validity of the airfreight forwarder experiment. CAB last month issued an exemption permitting the forwarders to function for a period not to exceed five years (AVIATION WEEK, Sept. 20). The Board authorized letters of registration for 55 of the indirect carriers.

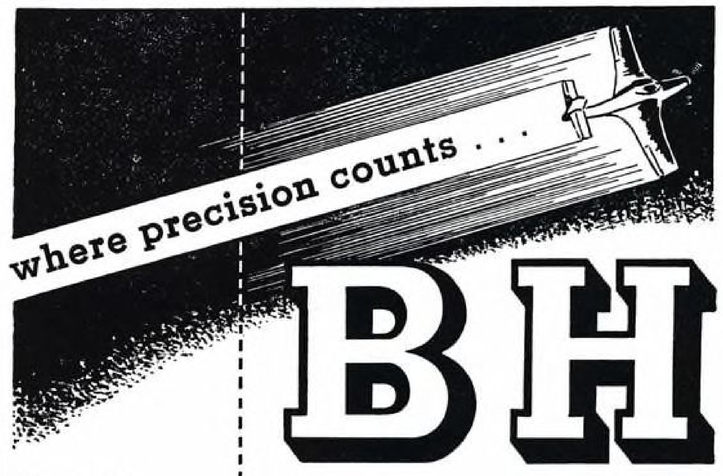
Present data supplied by the certificated airlines to CAB are inadequate to determine whether their cargo rates and services are proper, according to AFFA. It added that there is doubt whether the scheduled airlines' grandfather certificates give them authority to handle freight.

El Salvador Government Speaks for TACA

The government of El Salvador has made strong representations to the U. S. State Department, insisting that reciprocal air rights be granted TACA, S. A., to continue to operate between the U. S. and Central America.

TACA is now flying from San Salvador to New Orleans, but a CAB examiner last summer urged the Board not to renew the franchise because Waterman Steamship Corp. has acquired control of the air carrier (AVIATION WEEK, July 5). Pan American Airways is fighting renewal of TACA's foreign air carrier permit, charging that Waterman is attempting to get by subterfuge routes it could not obtain from CAB by direct application.

The Salvadoran government insists that TACA, S. A., is essentially a Salvadoran airline even though its parent company is a Panamanian firm controlled by Waterman. El Salvador now authorizes Pan American Airways to land in the country, and the government said that if CAB refuses to extend TACA's permit PAA will have an undesirable monopoly on air service to the U. S.



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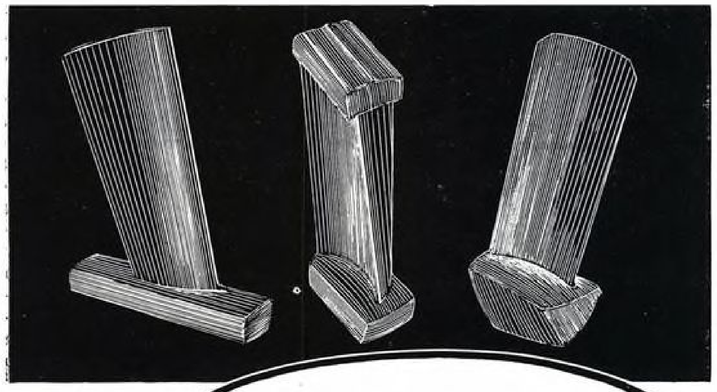

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CAB To Foot Bill For Florida Airways

While the Civil Aeronautics Board shows every intention of carrying out the death sentence imposed on Florida Airways last month, the feederline's stockholders have been assured they will not have to shoulder losses incurred by the experimental operation of the airline.

A tentative decision recently issued by CAB would give Florida $859,960, in mail pay (equal to 83.35 cents a plane mile) for the period between Jan. 10, 1947, when operations started, and May 31, 1948. This sum—$348,000 over the amount received by Florida under its temporary mail rate—would yield the carrier a 7 percent profit on its recognized investment during the 17-month period.

► **Future Payments**—In addition, Florida is to receive 79.35 cents a mile mail pay —equal to $528,000—between June 1, 1948, and Mar. 28, 1949, when its certificate is due to expire. The 79.35 cents a plane mile payment is the highest future rate ever set for a feeder and should yield the company about 8 percent profit on its recognized investment.

CAB reemphasized that although Florida had increased its revenues to a limited extent during its first 17 months of service, "the fact remains there has been no appreciable decrease in its dependence on the government." But, the Board continued, the decision not to prolong the feederline's life beyond Mar. 28 "does not affect out statutory duty to fix fair mail rates for the duration of the certificate."

► **Low Revenues**—During its first 17 months of service, Florida had non-mail revenues of only $94,003, CAB declared. Its operating expenses totaled $795,430, leaving a net operating loss before mail pay of $701,427.

Meanwhile, backed by civic interests, Florida Airways has asked CAB for reconsideration of the decision denying the certificate extension. The carrier said the ruling that the experiment "apparently had failed" went beyond the scope of the case, since Florida was never advised that its continued existence was at stake.

Portland Expands Airport

Port of Portland Commission has authorized a $2,000,000 bond issue to provide funds for expanding the Portland, Ore., airport by constructing an 8500-ft. runway. Total cost of the project's first phase is estimated at $2,582,554, of which $1,328,430 will be federal aid. Work is to be completed within a year.

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► **American**—Reports 92 percent of its short-haul passengers prefer to carry their luggage on and off Convair-Liners. Travelers using the craft have a choice of checking their baggage and having it stowed in cargo holds or carrying it aboard the plane and putting it in convenient cabin compartments. . . . AA is promoting its new in-flight reservations service.

► **Braniff**—Business is picking up on the carrier's routes to South America, inaugurated last June. Compared to the first month of service, revenue passenger mileage during the third 30-day period gained 134 percent, while mail and cargo volume rose almost 84 percent. Load factor in August was about 15 percent, but the carrier showed a $6023 operating profit for the month on its international run.

► **Continental Charters**—The Miami-based operator has been ordered by CAB to cease and desist from violating the nonscheduled exemption.

► **Flying Tiger Line**—Had a $128,511 net deficit on total operating revenue of $483,606 during the second quarter of 1948. Company flew 3,131,565 freight ton miles during the period. Employes June 30 numbered 231. . . . An interline cargo agreement has been signed with Philippine Air Lines.

► **Pan American**—Has inaugurated plane-to-shore radio message service for passengers on trans-Atlantic and trans-Pacific flights. . . . Company expects to break all air travel records between Miami and Havana this month. . . . A private PAA radio teletype system between New York and European stations has been placed in service.

► **Slick**—Now has 21 C-46s in its cargo fleet. . . . Company has produced a 22 minute sound-color motion picture, "The Story of Airfreight," to show to civic groups.

► **Trans-Canada**—Is carrying on domestic flights unaccompanied children between the ages of two and twelve if they are brought to the airport by responsible adults and if assurance is given that they will be met at their destination.

► **TWA**—Has inaugurated all-sleeper service between New York and Paris with 18-berth Model 749 Constellations. The de luxe flights, which operate every weekend, are booked solid westbound during October. . . . Company expects over 30,000 pilgrims to fly to Rome during the coming Holy Year.

► **United**—Has completed installation of 20 VHF ground receivers at New York, Chicago, Denver and other key points.

► **Wien Alaska**—Main hangar and two planes at the Fairbanks airport were destroyed by a recent $200,000 fire.

CAB SCHEDULE

Oct. 18—Oral argument in all-expense "Skycruise" case. (Docket 2377 et al.)

Oct. 18—Hearing on Board's enforcement action against Standard Air Lines. (Docket 3357.)

Oct. 25—Oral argument in Latin American route amendment case. (Docket 2311 et al.)

Oct. 25—Hearing in U. S.-Alaska service case. (Docket 3286 et al.)

Nov. 29—Hearing in New England states service case. (Docket 2196 et al.)

Dec. 1—Hearing on additional U. S.-Puerto Rico service. (Docket 2123 et al.)

Dec. 8—Hearing on Pan American Airways' Guatemala City-Los Angeles/San Francisco route case. (Docket 3277.)

Dec. 13—Hearing in TWA route consolidation case. (Docket 2581 et al.)

Dec. 15—Hearing on Board's enforcement proceeding against Transocean Air Lines. (Docket 3244.)

Jan. 5—Hearing on additional service to Puerto Rico. (Docket 2123 et al.)

Jan. 15—Hearing on need for equipment interchange agreements providing through service at St. Louis and Memphis. (Docket 3426.)

Feb. 16—Hearing in reopened Mississippi Valley and Southeastern States cases, postponed from Nov. 15. (Dockets 548 and 501 et al.)

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AVIATION WEEK

EDITORIAL

Coast-to-Coast by Sky-Coach

(Aviation Week devotes its editorial space today to Paul Andrews' account of a coast-to-coast round trip by $99 sky-coach. It is timely and informative. Andrews voluntarily and gratuitously recorded his experience. He holds no brief for any airline. Editor of two aviation magazines during five war years, winner of two TWA aviation writing awards, he is a former New York governor of the Aviation Writers Assn. and was one-time public relations director for Chicago & Southern Air Lines. He is now public relations director for West Coast University in Los Angeles. He is a member of United Air Lines' 100,000 Mile Club.—R.H.W.)

It's Tuesday night at Lockheed Air Terminal, Burbank. In ten minutes 23 New York bound passengers will stroll out to a plush four-engine airliner operated by a scheduled airline. Assuming round-trip fares at $345 per passenger, this luxury flight will gross approximately $4000 (less 15 percent) for the company.

Ten minutes later, 50 passengers will crowd through the gate to depart for New York in a clean, crowded four engine airliner operated by a nonscheduled airline. Again assuming round trip fares, at $227 per passenger, this sky-coach flight will gross about $5500 (less 15 percent).

There you have it. Sky-coach service, long discussed but never achieved by the scheduled airlines, is demonstrating rising cash returns while luxury service, and progressively higher fares, are leaving their marks in deep red.

Perhaps it's time for a "fly-witness" report on aviation's newest problem child. Unless the subject is approached without favoritism or malice, both the scheduled and nonscheduled lines stand to lose everything in ill-advised bickering over a few dozen planes and a few hundred passengers.

► Booking Passage. My sky-coach flight was not conceived as an editorial stunt. In common with 49 fellow passengers, I called Air America—to save money and time. Just a regular business trip. So the experience may be accepted as typical, even though Air America may be more, or less, efficient than the average sky-coach company.

Actually, airline choice was accidental. A half-dozen operators, using identical advertising themes and the same $99 fare, shout at the readers of every L.A. paper daily. One phone call. A two-minute wait. And space was confirmed to and from N.Y.C. Tickets would be delivered without charge or could be picked up at anytime up to 12 hours before departure. In contrast, TWA insisted on a 24-hour time limit for Constellation tickets. Yes, a personal check in the exact amount would be acceptable. A business check in any amount could be cashed. No, the full round trip fare need not be paid. A $20 deposit would hold my return space and protect my round trip discount.

That was all, except for one economy detail. It would be up to me, as a passenger, to call the N.Y. office for return space confirmation. Here was a worthwhile economy that might or might not be practical with scheduled airline passengers. But sky-coach travelers work hard for their round-trip ticket money. They aren't sure they'll get it back if they fail to show for a particular flight. So they call the airline. And they reach the airport on time. Sky-coach operators report a no-show factor of less than 5 percent. My own experience has shown dozens of phone calls invested in a single tentative or "maybe" passenger—without filling the uncertain seat.

► The Flight. Airport check-in procedures are orthodox. Personnel requirements are minimized because few coach passengers patronize the limousines. Hence, check-in is rarely complicated by sudden arrival of 50 passengers. A minor payroll economy is effected at the gate. One dispatcher teams with the stewardess, using two manifests of 25 names, arranged alphabetically.

Then the passenger enters Air America's DC-4. Removable seats. One lavatory with an unreliable latch. No overhead racks. No reading lights. No magazines. One dour stewardess. Paper cups for ash receivers. No coat racks. It bothered me to hang my top coat on a pipe running fore and aft on the starboard wall.

But few of the passengers shared my distress. Here was bus—or day-coach—travel in the clouds. It was cheaper than regular air travel. And faster than ground travel. They didn't even miss the food facilities of air travel. Perhaps they even enjoyed drinking warm water and cold coffee. I didn't.

Take-off was delayed 34 minutes until the stewardess unraveled a pair of Mr. Nelsons who complicated the manifest. This, at least, was in the best airline tradition. Flight time to Kansas City had been announced as seven hours. It took closer to nine. And a shuttered restaurant greeted our empty stomachs when we landed at Kansas City, Kan., just before daybreak. Yet only a handful of passengers, including myself, accepted the pilot's suggestion and taxied into town for breakfast during the hour-long refueling stop at Fairfax Airport. Bus travelers are accustomed to privation.

► New York. In 200,000 miles of commercial air travel, I never saw LaGuardia more attractive. Sky-coach ads had alluded to 12 flying hours. Add four hours to this. I offered my return ticket to someone at half-price, without success. Then a fellow passenger straightened me out. He said this was a stand-by ship, used only by Air America when nothing better was available. He knew. He had flown Air America seven times in following the horses. The westward flight would be better. I kept my ticket. I'm glad I did.

► Westward Ho. The westward flight was as pleasant as the eastward hop had been unpleasant. With only 50 seats in a two-three cabin arrangement, leg room was unbounded. Interior walls were paneled in light and dark mahogany veneer in the best early-Braniff mode. Seats were a carryover from American's first DC-4 experiments. Overhead racks and reading lights had flown with PAA. The stewardess had been trained by United. And 36 passengers comprising the second-section manifest were saving a week's pay while sacrificing nothing but cheesecake.

Moreover, they were passengers too-long ignored by the scheduled airlines. If one wishes to challenge the popular premise that "sky-coach service is skimming the cream of the air travel market," my fellow passengers provide their own best answer:

- 70% were flying for the first time on any commercial airline.
- 50% would have stayed home if their choice of transportation were limited to trains, buses, or scheduled airlines.
- 60% were women, generally unmarried and with modest incomes.
- 80% were traveling for pleasure or for purely personal reasons.
- 90% intend to patronize the sky-coach service in the future.
- 30% had switched from scheduled airlines because of the cost.
- 10% will patronize regular airlines in the future, regardless of sky-coach economies.

As further evidence that sky-coach passengers constitute a new market rather than a decimation of regular airline markets, occupational analysis of my fellow passengers may be interesting. With 34

(Continued on page 58)

ADVERTISERS INDEX

AVIATION WEEK
OCTOBER 18, 1948

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(Classified Advertising)

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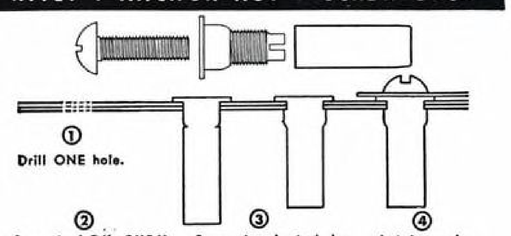

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EDITORIAL

Coast-to-Coast by Sky-Coach

(*Continued from page 56*)

seats occupied by adults (two school children and five infants completed the loading) the following pursuits were revealed:

- 5 passengers were housewives traveling with their husbands.
- 4 were salesmen traveling at personal expense.
- 2 were business men traveling to trade conventions.
- 2 were nurses traveling for personal reasons.
- 2 were actors fleeing from a "flop" on Broadway.
- 2 were teachers returning from a New York seminar.
- 2 were typists seeking employment in California.
- 2 were domestic servants returning from vacations.
- 2 were European tourists visiting American friends.

The balance of the list included one each of the following:

Telephone operator, social worker, dress patternmaker, machinist, truck driver, buyer, dress designer, press agent, exporter, student, secretary.

This, then, is the market for three-penny air service. But what about the methods which have raised revenues while reducing costs? Is economy effected at the risk of passenger lives?

► **Pilot Experience.** Frankly, I doubt the latter. Air America leases its ships and crews from California Eastern and The Flying Tigers. No one can challenge the safety record of Douglas DC-4 equipment and both of these nonscheduled operators have built enviable air and ground records. On two occasions, the Air Transport Magazine maintenance award for nonscheduled carriers has gone to California Eastern.

In so far as individual flight crews are concerned, Air America is justifiably proud of seven crews currently comprising its "operations" division. Four captains—Ed Kerbs, Al Lee, Ray Moore, and Sam Stevens—formerly flew with United. Two others—Bill Stevens and George Rodieck—flew with Trans World and Pan American respectively. The latter has also been with Braniff and Mid-Continent. Only John Slaughter, who was a command pilot with the NATS, is lacking in scheduled airline experience.

Similarly, Air America copilots carry plenty of experience into the DC-4 cockpit. Don Penn flew with American and Stan Kerk with United. Howard Kelly logged time in Northwest cockpits and Winston Deficux gained bad weather experience with Alaska Airlines. Doug Garneau has flown for Western and Tom Williams was a Brass Hat Squadron major with the Air Transport Command. The latter, incidentally, typifies Air America copilots. He is 29 years old, has 2200 four-engine hours. His flying experience includes 1550 day hours, 1200 hours of night flying, and 275 instrument hours. Add to this his training in navigation at Pan American, flux-gate compass instruction at Bendix, loran instruction in two Army Air Force schools and you have a very handy second man at the controls.

These men are flying on sky-coach assignments for two reasons. They like flying too well to sit out a scheduled airline seniority list dictated more by union regulation than by flying competence. And they want to make money. An Air America captain earns a full $12 per hour, with a monthly guarantee of $500. Logging a full 85 hours monthly, their earnings currently top $1000 every thirty days. Copilots are paid a flat $300 monthly to start; automatically advance to $400 after six months. In addition, flight crews and cabin personnel receive expenses at the rate of 30¢ hourly —from the time they leave base until they return.

Cabin crews also do very well with Air America. Marilyn Mingo, my stewardess earns $200 monthly. She was trained by United. Jim Eaken, who relieved her as steward at Kansas City, earns $225 monthly. He formerly worked on Flying Tiger service between Los Angeles and Tokyo.

► **Other Cost Cuts.** With little effort to economize aloft, it should be obvious that Air America cuts its corners on ground procedures and on services over and above the airline's basic transportation function. Here are a few examples of economy:

- **Air America leases its planes by the flight, eliminating equipment depreciation on grounded planes which produce no revenue.**
- **Air America relegates its sales problems to several brokers in each route city. These brokers maintain ticket offices, sponsor all advertising, pay all ticketing personnel, appoint sub-agents without contractual commitments of any kind.**
- **Air America buys all ground services by the flight. At Kansas City, for example, the payment for plane cleaning is $5. The landing fee at Fairfax Airport is $20 per flight.**
- **Air America limits meal service aloft to "snacks" served on throw-away paper plates. A typical snack includes a sandwich, sweet-roll, apple juice and coffee.**
- **Air America uses airmail for all possible communications between Los Angeles and New York, reserving teletype service, which is leased by the hour, for urgent messages.**
- **Air America assigns the steward or stewardess to dispatching and commissary functions en route.**

When these economies are amplified by one or more flights daily in each direction, they assume worthwhile proportions in the ledger. Maximum utilization of personnel—a staff of four gives round-the-clock reservations service to seven sky-coach airlines in New York—plus a minimum passenger loading of 35 (except on extra sections) explains the balance of Air America's profit with three-penny service.

Also, the nonskeds are more friendly toward each other than are their counterparts in ATA. They save money and time that way. If Air America has only one or two Cleveland passengers, they shoot them over to Viking or Standard without even asking passengers to exchange their tickets for appropriate Cleveland ducats. So what? So, no letdown or takeoff costs for a single passenger. Chicago-bound traffic is in one ship, Philadelphia passengers in another, Washington travelers in another.

Incidentally, Air America's operation began early in July, has shown a profit since its third week. Load factors eastbound average 95 percent, if you discount extra sections which are operated primarily for customer convenience. Westbound loads are lighter—about 65 percent on week-days, 85 percent on Saturdays.

► **Summary.** This, briefly, is sky-coach air travel. It isn't the final answer by any means.

So far, the nonscheduled operators have been able to alibi everything from cold coffee to late departures as "economic" factors. But better rail coaches and cheaper fares on scheduled airlines will quickly turn the most placid passengers into an irate enemy. Market saturation, already apparent in west bound traffic, is quickly reached during non-vacation months and will eventually come when the reservoir of travel-conscious stenographers runs its course (they travel infrequently.)

Conversely, the scheduled airlines cannot ignore the sky-coach services, whether or not overhead can be absorbed in sub-standard tariffs. The cards are stacked against the nonscheduled operators—but they are making money. They receive no mail pay—but an economy-minded public might force this issue. They aren't allowed the use of public address systems at LaGuardia Field, but their customers may force this point as New York City's customers. They can't rent vacant counter space at LaGuardia, or even occupy a $20 cubby-hole proferred by Shell, but a revenue-conscious Port Authority bond-holder could break this scheduled airline toe-hold. They can't sell Travelers' trip policies to passengers, although they provide $50,000 coverage per seat on a trip-term basis, but one insurance company could break this solid ATA pedestal.

Yes. Tuesday night is a low-point at any airport terminal. Except at the sky-coach gate. Something less than a two-headed ogre and something more than a passing fad, the sky-coach is getting non-travelers and non-flyers into the air. Personally, I can buy a dozen meals and a hundred female smiles at the Stork Club—for the $117 additional for scheduled airline cheesecake. Not that I don't like champagne. But I often drink beer.

PAUL ANDREWS

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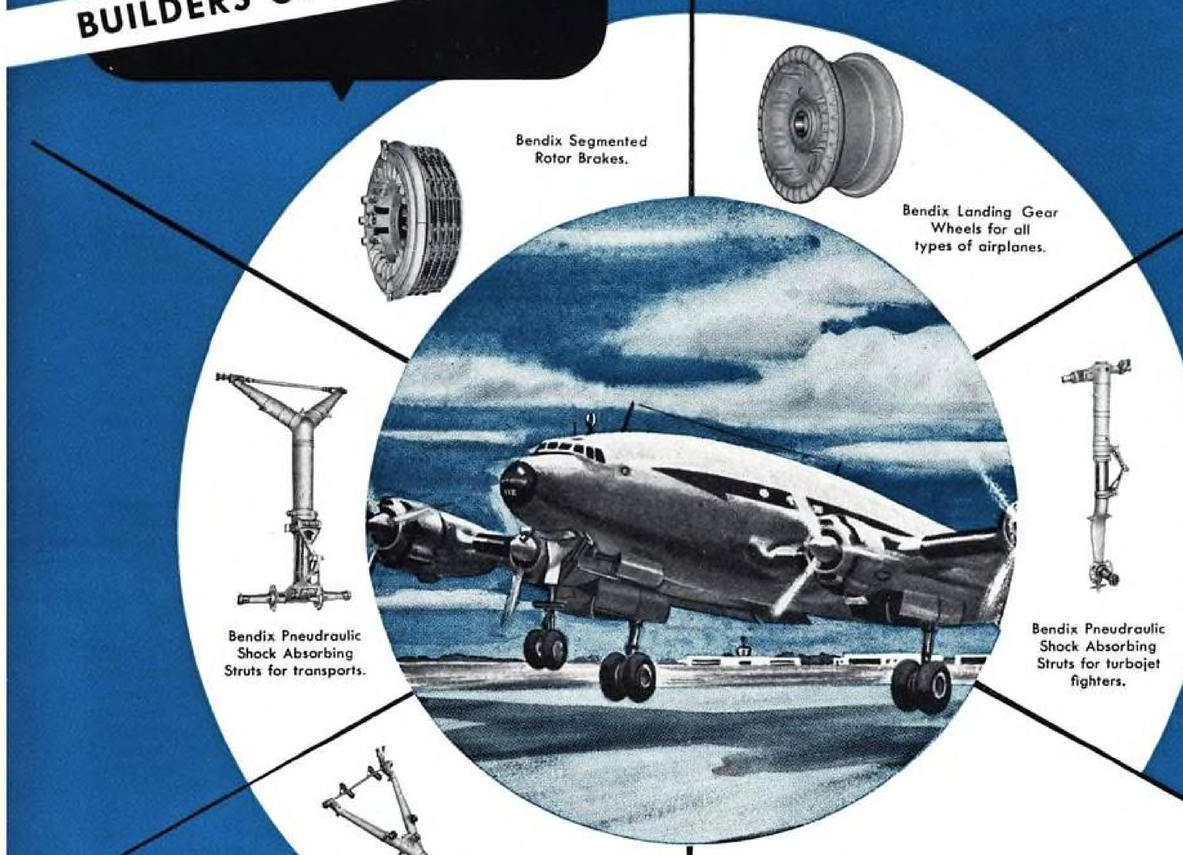

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