


AVIATION WEEK

OCT. 6, 1947

INCORPORATING AVIATION AND AVIATION NEWS

A MCGRAW-HILL PUBLICATION

FOR AIRCRAFT ENGINES . . . AIRCRAFT SPARK PLUGS



BG

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BG equipped planes won these
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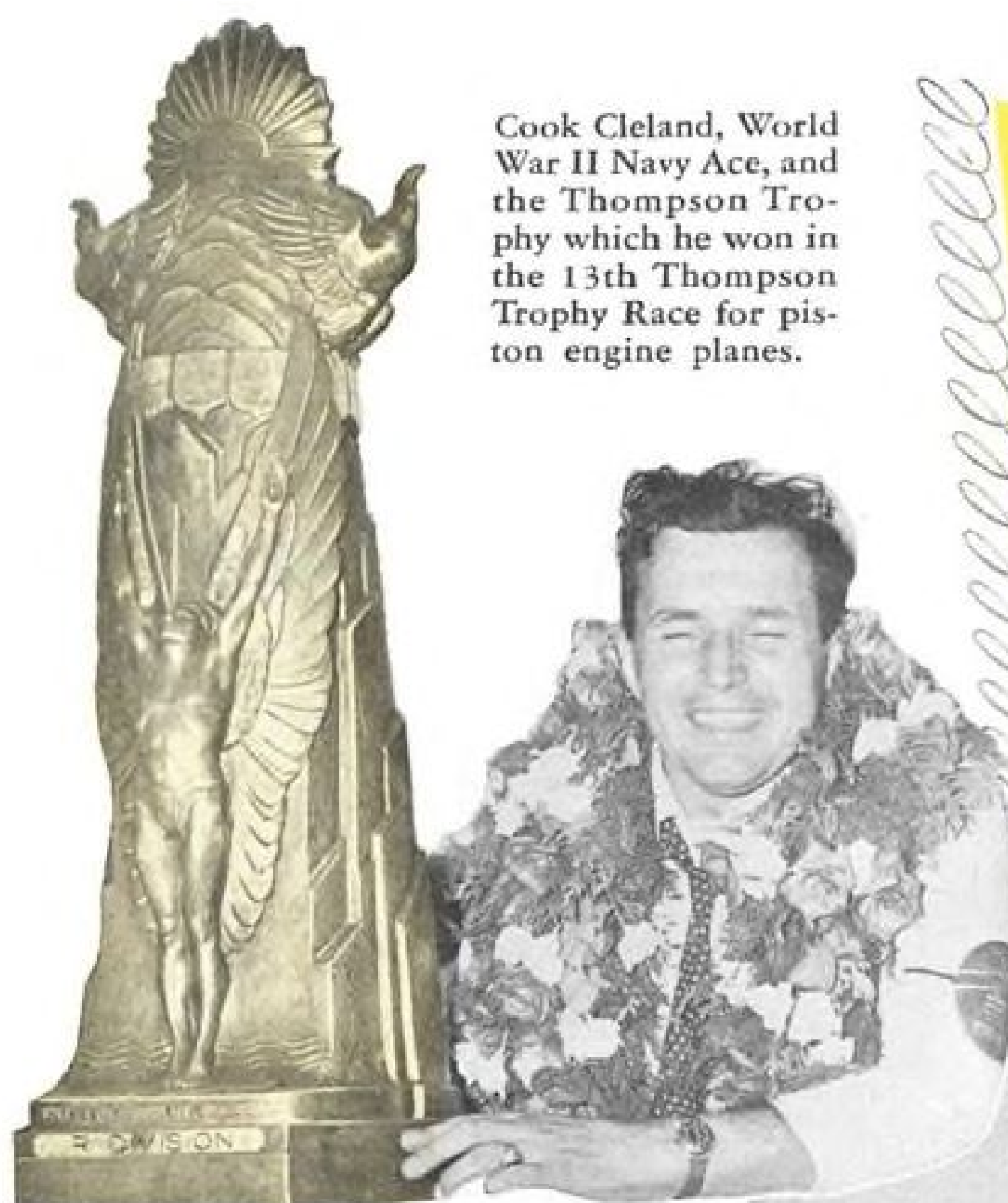
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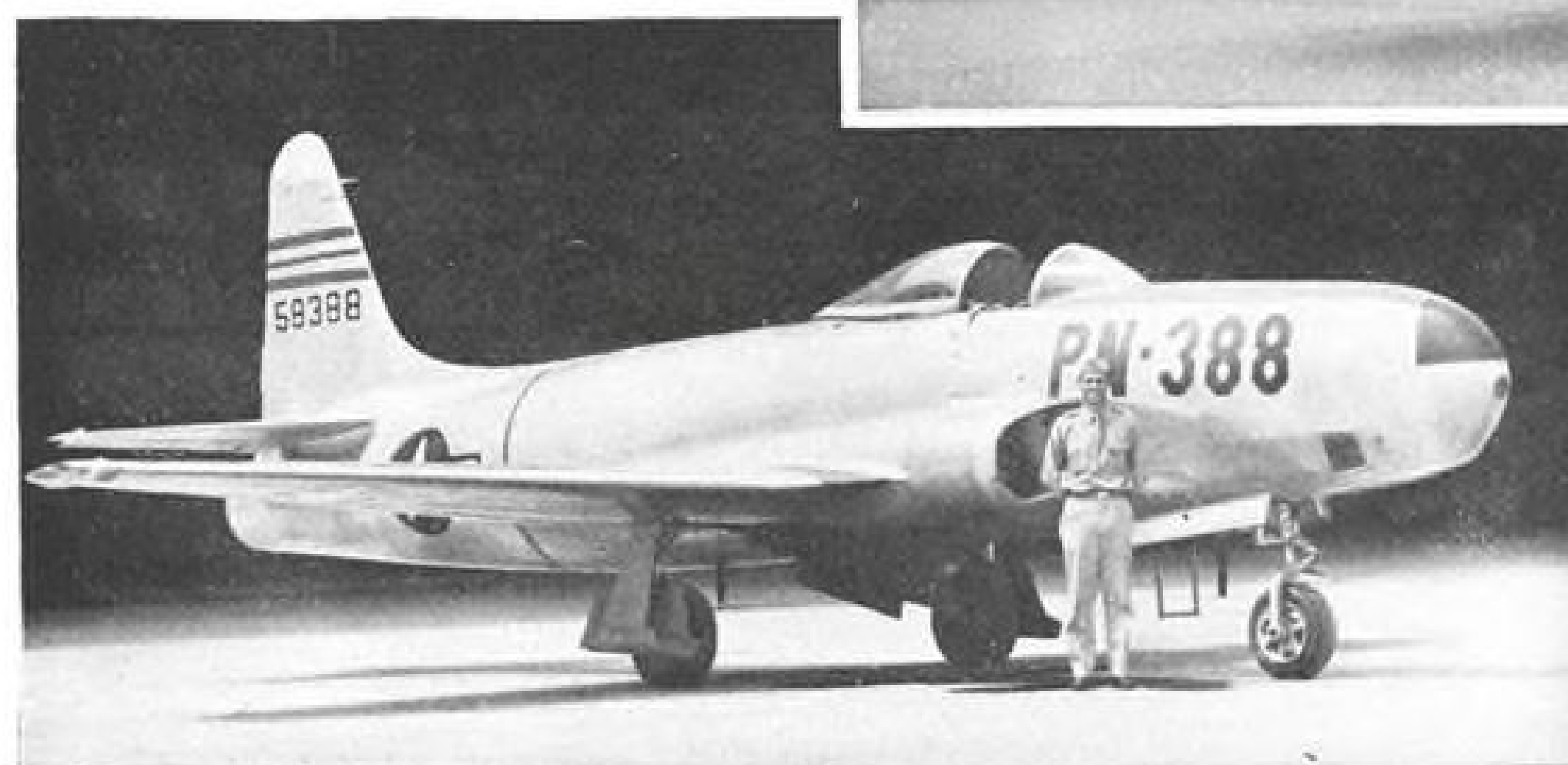


Cook Cleland, World War II Navy Ace, and the Thompson Trophy which he won in the 13th Thompson Trophy Race for piston engine planes.



The checkered flag—signal of victory and a new world speed record for closed-course flying in the 1947 Thompson Trophy Race.

Cleland's "Corsair", a stripped-down Navy fighter, set a new world's closed-course speed record for piston engine planes. The 3500 h.p. 28-cylinder Pratt & Whitney "Wasp Major" engine whipped the plane around the 15-mile course twenty times at an average speed of 396.13 m.p.h. Cleland's share of the \$42,000.00 prize purse was \$19,500.00. Photo shows ground crew.



This Army Air Force P-80 fighter was winner of the Thompson Trophy Race for jet-powered planes. Piloted by Lieut. Com. Robert L. Petit, it averaged 500.70 m.p.h. on its eight laps of a 22.5-mile course. It was equipped with an Allison J-33 turbo-jet engine. Since the war the Thompson Trophy Race has been flown in two divisions, one for piston engine and the other for jet-powered planes. Duplicate Thompson Trophies went to both winners.

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World's fastest plane lands on B. F. Goodrich tires

A NEW WORLD'S SPEED RECORD of 650.6 miles per hour was recently set by the Navy's Skystreak. Built to find the answers to transonic speed problems, the Douglas-El Segundo plane has a distinctive, high speed design. And that design posed a tough problem to tire engineers.

The Skystreak's wings had to be wafer-thin to knife through the air at such speeds. That meant the tires had to be extremely small to retract into them. Yet these tires had to be strong enough to take the landing impact of the 10,000 pound load at the fastest speeds in air history!

B. F. Goodrich engineers produced

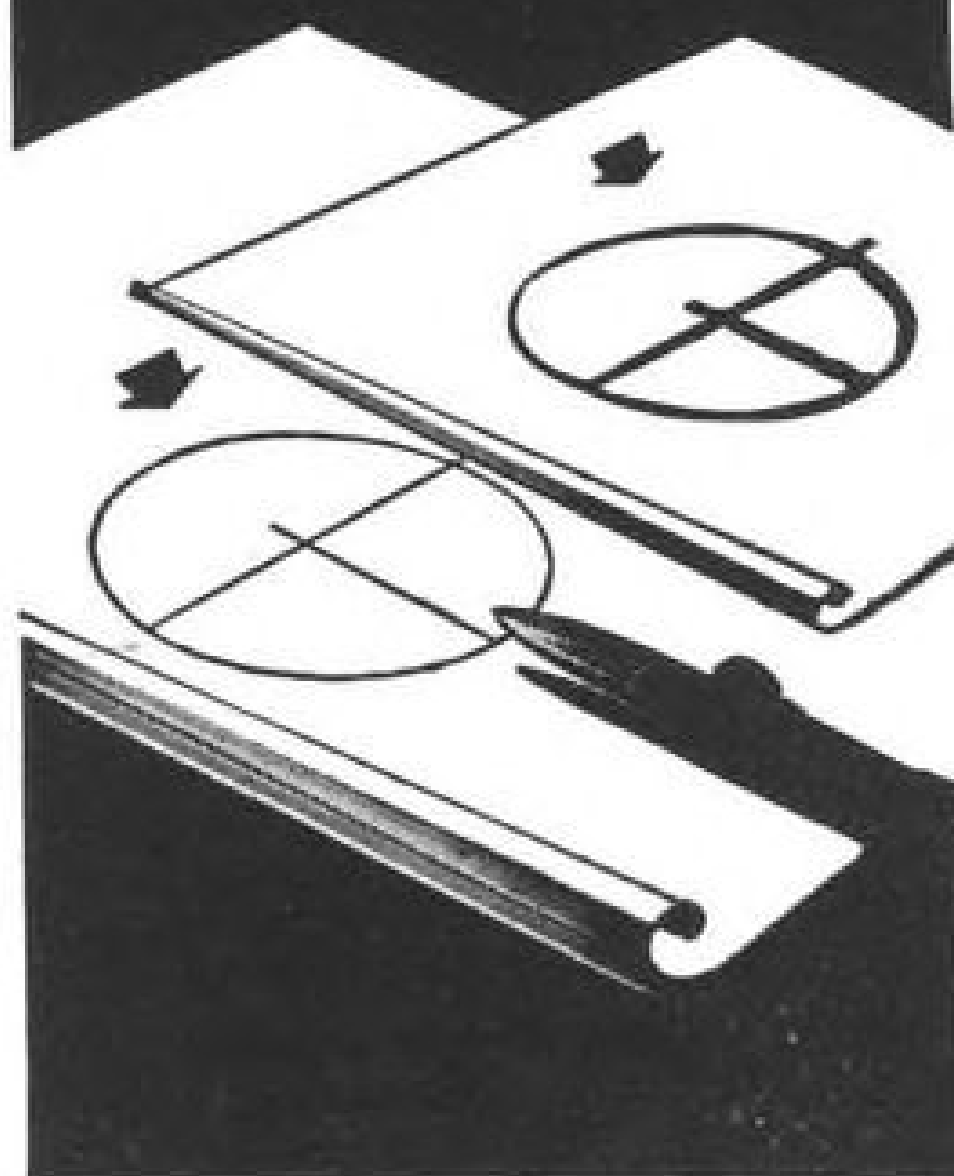
the answer—a 20" diameter by 4.4" width, 8-ply, nylon tire which carries 175 pounds air pressure per square inch! This new B. F. Goodrich tire combines the smallest size and highest inflation pressure ever used on the main wheels of a plane. And gruelling tests have proved it's a star performer.

This is not the first time B. F. Goodrich has pioneered a new type of airplane tire. The first tire engineered and designed specifically for airplanes was a B. F. Goodrich development. The first Type III tire was originated by B. F. Goodrich engineers. The first Type II tire was

developed by B. F. Goodrich for an early Grumman Navy plane. And B. F. Goodrich made outstanding contributions to all industry-wide tire developments during the war. Its 38 years' experience in the airplane industry enables B. F. Goodrich to build better tires for today's airplanes—and to engineer sound, lasting developments for the aircraft of tomorrow. *The B. F. Goodrich Company, Aeronautical Division, Akron, Ohio.*

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AVIATION WEEK

Vol. 47 No. 14

Oct. 6, 1947

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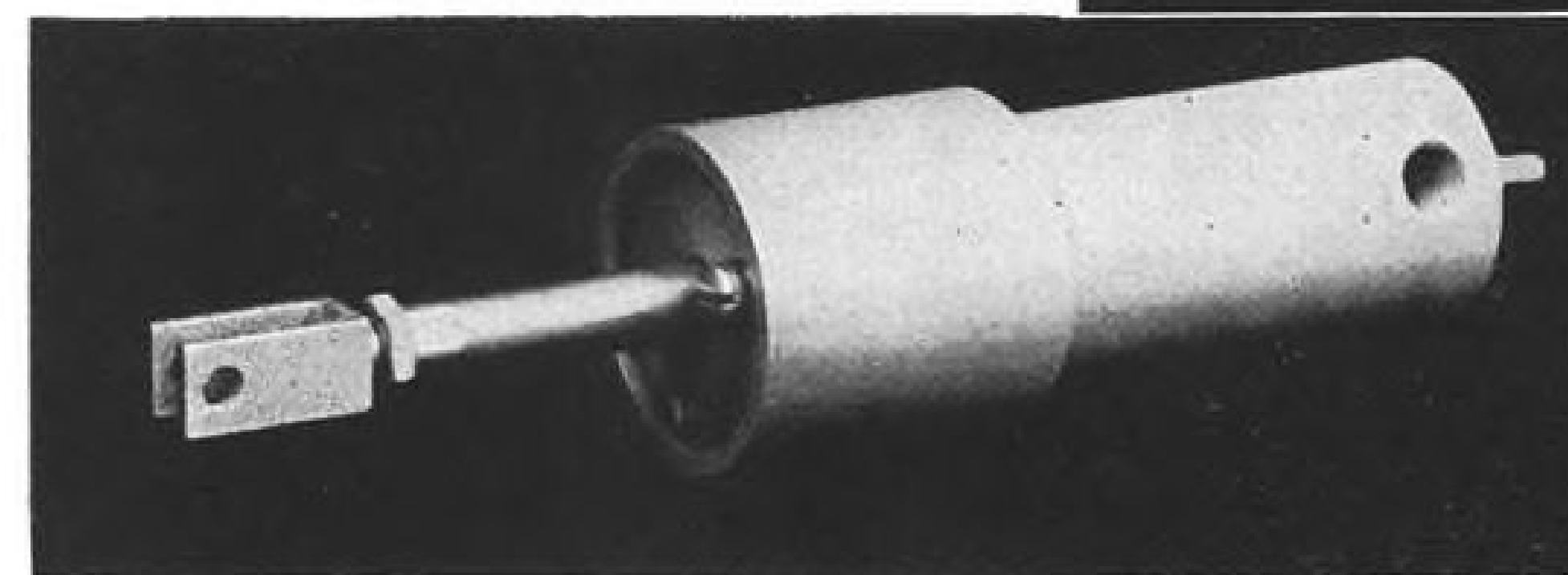
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AVIATION WEEK, October 6, 1947

HYDRAULIC CYLINDERS

by **ELECTROL**

FOR PERSONAL AND MILITARY AIRCRAFT

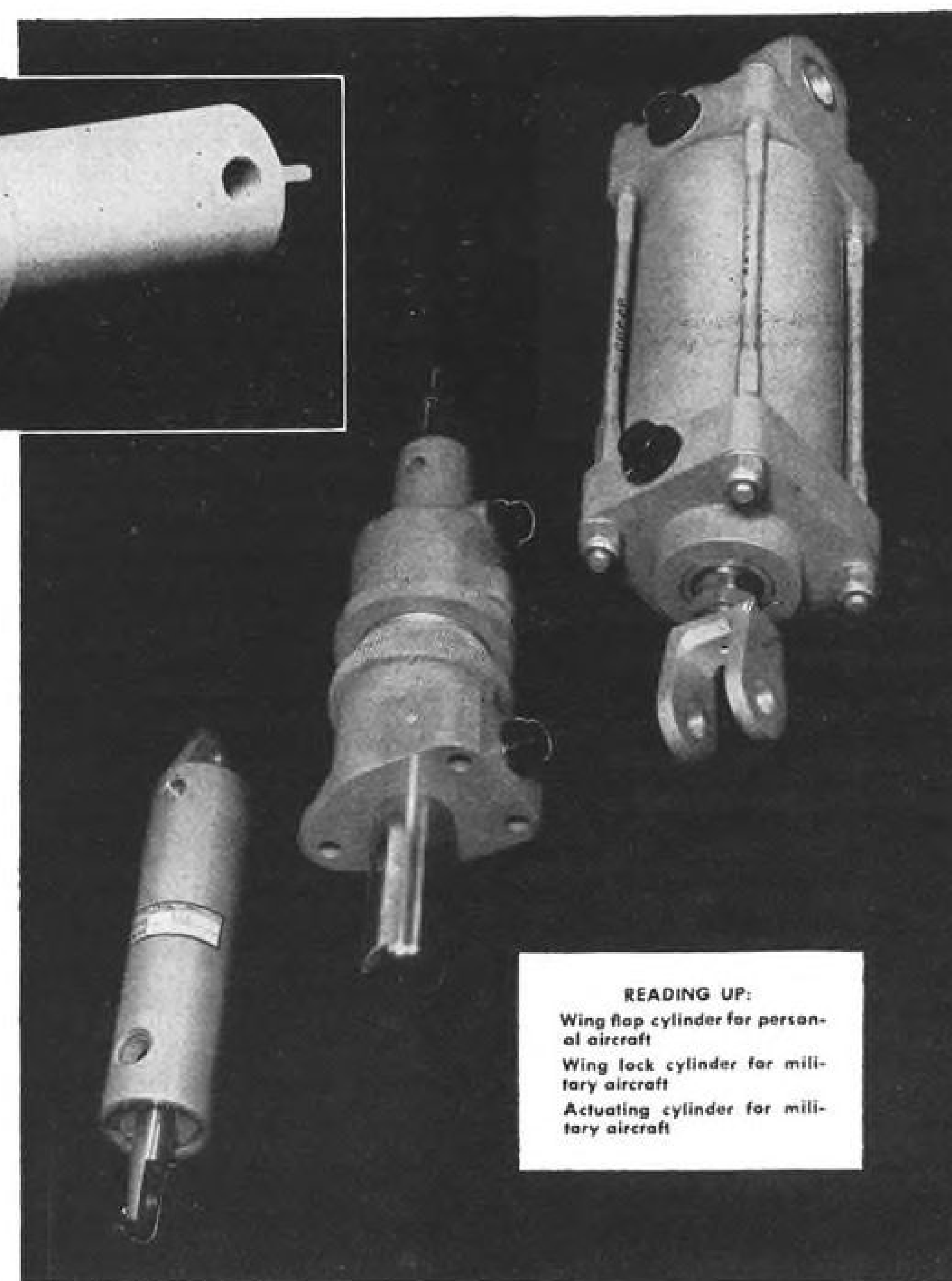


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AVIATION WEEK, October 6, 1947

Do these false beliefs keep you from converting to aluminum?

(Below are 4 *misstatements* commonly applied to aluminum. Have *you* made any of them?)



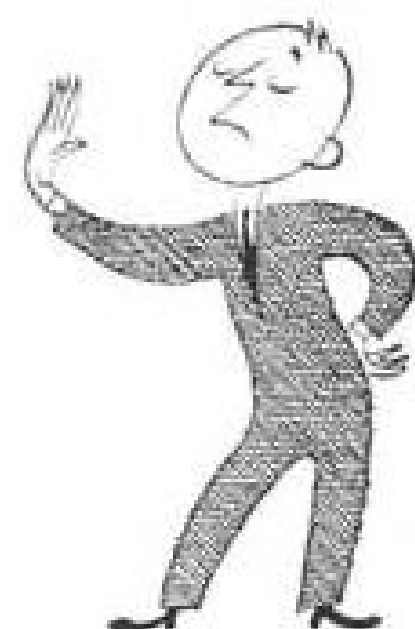
1. "Aluminum is not readily adaptable to my product"

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2. "Aluminum costs too much"

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3. "My competitors aren't converting. Why should I?"

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4. "I can't be sure of a steady, long-term supply"

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AVIATION WEEK, October 6, 1947

THE AVIATION WEEK

COMMISSION ON TOUR—From the quiet cloister of the Department of Commerce auditorium, the President's Air Policy Commission has transferred its fact-seeking investigation to the rivet-gun clamor of the nation's aircraft plants.

In Washington it has had a stiff indoctrination course in the problems and principles of airpower in relation to aircraft manufacturing. As it wings its way westward in a USAF C-54 it will see first-hand what the manufacturers in a six-inch-high pile of mimeographed testimony described.

After a stop at Wright Field, skeletonized from its wartime size, the Commission will stop at Wichita where Boeing has relinquished a government-owned plant and is keeping its own huge factory in partial use with a small liaison plane order and sub-assemblies for B-50s and Stratocruisers being made in Seattle.

COAST IMPACT—The Wichita impressions may be softened and shaded at Fort Worth with production of the B-36 on view. So it will not be until the Commission's plane reaches the coast that the manufacturers' testimony begins to take the grim shape of an industry in low gear.

In Washington the manufacturers stressed the need of long-range procurement planning. They emphasized that low volume means high cost, low efficiency. West coast opinion is that the Commission will readily appreciate the manufacturing waste stemming directly from the fact that aircraft industry employment has as many peaks and valleys as the rugged Sierras that sprawled below the C-54's wings.

The 100,000 workers now employed by Douglas, Lockheed, Northrop, Ryan, North American, Convair, Boeing and the others are intelligent, organized—and see the handwriting on the wall.

THE SPREAD-OUT—Without the spur of war emergency, they are not expected to exert themselves and speed the day that will find their projects completed and themselves out of a job. Knowing factory heads are spreading the completion of existing contracts as thinly as possible to hold together as long as they can the nucleus of their organizations.

This, say west coast observers, is a major reason for current high production costs, and the Commission will have ample opportunity to see it in the factory walk-arounds they have scheduled, taking them from coast-to-coast and back in seven days.

Industry employment is dropping country-wide; a sharp drop on the west coast is seen for this winter. Production of components for planes now on order will then be completed, leaving only final assembly lines active. Boeing is hiring, North American, too, but only to reach a momentary peak on military orders.

WAY TO PREPARE—What the Commission will see, particularly on the west coast, during its eight-day swing around the country, should serve to point up the manufacturers' contention that they are losing even a production nucleus around which to expand rapidly in case of need.

There is indication that some manufacturers believe the shrinkage already has gone so far that industrial preparedness theories must be revised.

The "big names" of the industry, in response to Commission questions in Washington, cast a shadow over industrial preparedness planning as the best approach to speedy mobilization. While not underrating industrial preparedness planning (the aircraft industry has been its most ardent champion), these men speculated aloud on whether planning alone is enough, or whether a large air force in being is not a better approach to such a vital and important question as this.

UNFINISHED BUSINESS—The search for a national air policy did not depart Washington with the President's Commission. The joint Congressional committee's advisory group of experts have split into sub-groups to hash over in private the problems of all aspects of aviation, calling in for consultation such government officials as they may deem necessary.

And with the departure of the Commission, other issues, dormant while aviation concentrated on slaking the Commission's thirst for information, press for attention. The prime one is not new: it has been in public focus before. It is: safety.

NONSKEDS IN FOCUS—The President's Air Safety Board has dealt in the main with operating principles and techniques. Specific accidents studied have all involved certificated, scheduled carriers. Nonscheduled lines, as they operate under the same safety rules, have not seemed to warrant special notice by the inquiry.

There is belief that CAB is now studying the safety standards of some of the nonscheduled passenger lines, measuring them up against the existing prescribed regulations.

Evidence of low safety standards maintained by operators on the New York-Puerto Rico run point up the ease with which CAB can choke off their services whenever such action is deemed necessary. Letters granting the nonskeds authority to fly under the nonscheduled exemption of the economic regulations "are subject to immediate suspension when required in the public interest."

No evidence is at hand that CAB contemplates such action. But CAA's inspection personnel is limited. If safety violations continue, and there is some opinion they are widespread, CAB may use its suspension power as a weapon to enforce safety.

AVIATION WEEK, October 6, 1947

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NEWS DIGEST

DOMESTIC

Lt. Gen. Ira C. Eaker, (ret.), former deputy commander of the AAF, was appointed vice president of Hughes Tool Co., Houston, Texas.

Transocean Air Lines, Oakland, Calif., has been awarded an Army Engineer Corps subcontract to carry construction workers to Pacific island bases, including Guam and Okinawa, on a twice-weekly basis. Carrier is negotiating a contract with the Australian government similar to the one with Canada under which 7,000 emigrants are being flown from England to the Dominion.

Brig. Gen. Lucas V. Beau, Jr., will be commander of Civil Air Patrol, replacing Brig. Gen. Frederic H. Smith, Jr. Beau is former European Air Transport Service commanding general.

Robert Kinkead, former assistant to Boeing Aircraft Washington representative James Murray, is the new export manager of Fairchild Engine and Airplane Corp. replacing Marvin Parks, whose future plans are unannounced.

FINANCIAL

Delta Air Lines reports a net loss of \$310,249 for the year ended June 30 compared with a net income of \$362,017 for previous year. Operating revenues increased to \$11,488,836 from \$7,861,671 the year before but operating expenses rose from \$6,694,265 to \$10,837,709.

Air Associates, Inc., reports net loss of \$67,197 for nine months to June 30 against profit of \$53,213 for corresponding period last year. Sales were up from \$3,533,641 to \$5,115,982.

Boeing Airplane Co. stockholders approved a plan authorizing directors to issue new shares or buy open-market shares for incentive awards to employees. Up to 6 percent of net profits before taxes are authorized for distribution to officers and employees for substantial contributions to company success.

FOREIGN

Governments of China and United Kingdom signed an air transport agreement authorizing commercial air services between the two countries. British may now fly into Kunming, Canton, Shanghai and Tientsin. Chinese are now authorized to operate to London, Prestwick, Hongkong, Singapore, Penang, Kuching, Jesselton and Labuan.

Roger Lewis, former asst. general sales manager of Lockheed Aircraft Corp., was named sales manager of Canadair, Ltd., Montreal.

*On the
Douglas DC-6*

Safety Glass

BY "PITTSBURGH"

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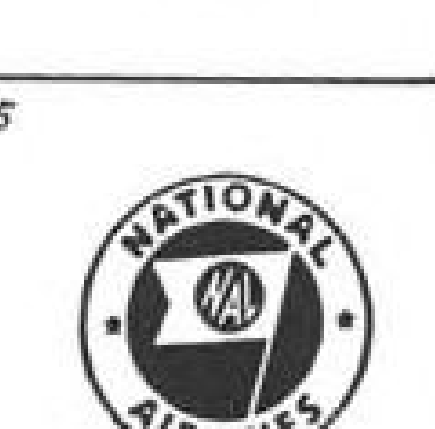


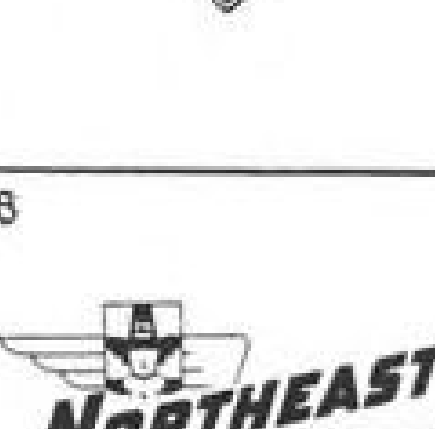
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(How many can you identify. See below.)

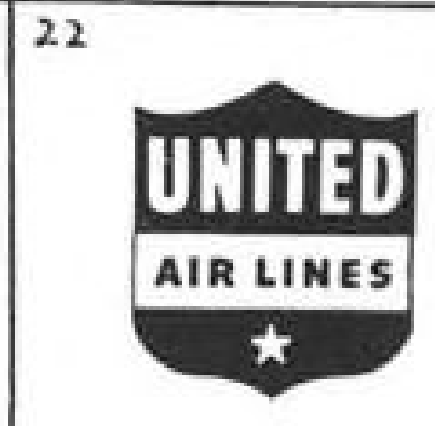
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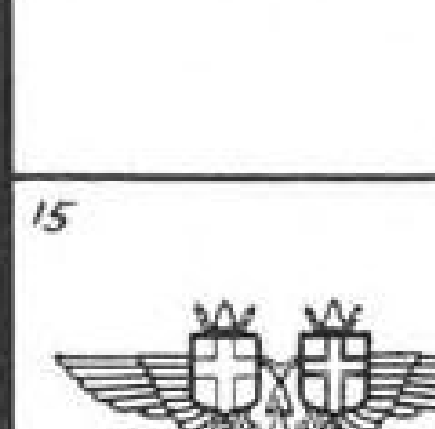
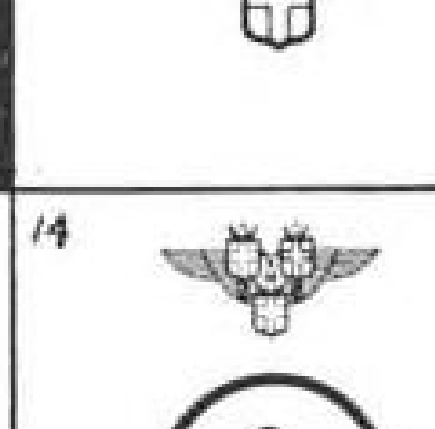
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*Dom., Domestic—Int., International





EXIDE AIR TRANSPORT BATTERIES

Air Industry Leaders Urge Plan For Striking Air Arm Production

Manufacturers emphasize needs for adequate Air Force before next emergency becomes acute; want more contracts.

By ALEXANDER McSURELY

Urgent need for immediate implementation of a positive national policy on air power, which will provide for its two necessary components: a strong air force in being, plus an aircraft industry which can supply modern equipment in adequate quantities as required, was laid before President Truman's Air Policy Commission last week, by the nation's principal aircraft manufacturers.

Top executives of the nation's primary producers of military aircraft took their turns in the witness chair before the five-man Commission in the Commerce building auditorium, and when the hearings were adjourned, their combined testimony and briefs formed a massive substantiation for the following recommendations:

• **A Continuing Program** for military aircraft procurement of minimum five-year duration, with revisions in the light of new developments as the program progresses.

• **Annual Military Aircraft** procurement level sufficient, with available commercial aviation business, to maintain a manufacturing industry capable of expansion to wartime requirements.

• **Meeting Wartime Needs** as far as possible in advance by stockpiling essential or critical materials, standby plant facilities, and general purpose machine tools, and by vocational education to increase supply of skilled manpower.

• **Heavy Emphasis on Research and development**, at least "break-even" with compensation for experimental development contracts.

• **Remoteness of Push-Button** guided missile warfare requires maintenance of an Air Force of constantly improved types for at least the next 10 to 15 years.

Four key spokesmen outlined the aircraft industry's overall present position in comparison to its tremendous wartime size and production capacity,

and its puny prewar status: J. H. Kindelberger, president, North American Aviation, Inc.; W. M. Allen, president, Boeing Airplane Co.; J. Carlton Ward, Jr., president, Fairchild Engine & Airplane Corp., and Maj. Gen. Oliver P. Echols, president, Aircraft Industries Association.

► **Warn of Losses**—Both General Echols and President Ward, warned that the aircraft industry is "deteriorating" rapidly under the huge losses which it has sustained in postwar operations. If military contracts continue another two years on the basis of last year's status, Ward told the Commission, the U. S. will lose many of its aircraft design teams. Echols, a key figure in World War II AAF aircraft development and procurement, described the aircraft industry in pre-war days as largely a "development industry" which was expected to be mobilized into wartime expansion by "industrial planning based on imaginary assumptions. But when war came, we threw away the assumptions and started from scratch," he told the Commission.

Military aircraft development and production today is "incomparably more complex and each new aircraft costs many times more, than would its counterpart of a few years ago, because of the difficult aerodynamic problems of sub-sonic, trans-sonic and super-sonic flight, and the transition period between reciprocating and jet power which is now in progress," he testified.

► **Urges Stockpile**—Kindelberger told the commission:

"So far I haven't seen anything done on stock piling, although there has been a lot of planning and talk." He recommended establishment of a material stockpile under a single control, presumably government, rather than individual stockpiles for the various factories. He said there was no indication that principal materials for aircraft would soon be subject to obsolescence.

"No airframe preparedness planning will be worth anything if there is not a strong airframe industry to utilize it," the North American president continued.

"In very general terms I believe that existence of a strong industry will of itself accomplish about 50 percent of the time-saving that could be accomplished by the ultimate in elaborate preparedness planning. About 40 of the remaining 50 percent could be accomplished by arranging for availability of plants, machine tools and materials."

W. M. Allen advised the Commission that Boeing's experience with heavy bombers indicated that contract planning should extend for at least seven years, since it required at least that long for the complicated aircraft to be developed to a stage of real military usefulness. He cited the period of 1937 to

Oct. 5: Washington to New York to Wright Field, Dayton, Ohio.

Oct. 6: Visit Wright Field, then to Indianapolis, visiting CAA research center, and Allison division, General Motors Corp., then to Wichita.

Oct. 7: Visit Beech and Cessna plants, then to Ft. Worth, visiting Convair plant, then to San Diego.

Oct. 8: Visit Ryan and Convair plants, then to Los Angeles, visit Lockheed plant.

Oct. 9: Visit Douglas Santa Monica and El Segundo plants, North American, and Northrop plants.

Oct. 10: Los Angeles to Moffatt Field, San Francisco, to NACA Ames Laboratory.

Oct. 11: San Francisco to Seattle, visit Boeing plant.

Oct. 12: Return to Washington.

1944 as the development period which the B-29 bomber went through before going into combat, and pointed out that over a large portion of that time wartime urgency and priorities second only to the Manhattan atomic bomb project were speeding the work, so that a longer development period could be expected in peacetime.

► **Minimum Needs**—The Boeing president set up as the minimum requirement for a heavy bomber plant which can develop and produce bombers in production quantities at reasonable cost and maintain a plant and organization capable of reasonable expansion in emergency, an annual volume of \$80,000,000 and a working force of 13,000 employees. Such a volume in terms of present cost would permit manufacture of two experimental B-47 jet bombers at \$10,500,000, ten YC-97 cargo planes at \$20,360,000 and 60 model B-59 bombers at \$48,460,000 all figures including spares.

Panagra Asks Suspension Of New Braniff Service

Pan American-Grace Airways last week petitioned CAB to "suspend or substantially amend" the certificate for South American operations awarded to Braniff Airways in the Board's Latin American decision last year.

Harold J. Roig, Panagra president, said "present traffic in the area does not warrant the Braniff operation, particularly since foreign competition has appeared in an effective way." The petition asked an immediate hearing. Braniff has not yet started Latin American service, although it filed airport notices last month indicating operations as far south as Lima, Peru, might be inaugurated shortly.

Hughes Quiz

The Senate War Investigating Committee's subcommittee headed by Sen. Homer Ferguson (R., Mich.) is standing pat on its plan to re-open hearings Nov. 17 on the Howard Hughes cargo and reconnaissance plane orders. Committee counsel Francis Flanagan lays odds that Hughes will be re-called to Washington to testify. Subcommittee member, Sen. Harry Cain (R., Wash.) who applauded the contribution to aeronautical research of the Hughes cargo craft after an inspection of the ship, nevertheless maintains that the subcommittee should move ahead with its investigation to determine what part politics played in the awarding of the Hughes contracts. It is understood that the group will concentrate on any taxation that may have been evaded by Hughes Tool through deductions for the entertainment expenditures of public relations man Johnny Meyers.

United, PCA Drop Martin Plane Orders

Cancellation of orders for 70 Glenn L. Martin Co. transports was revealed last week by airline executives.

President William A. Patterson of United Airlines announced withdrawal of United's \$16,000,000 order for 50 Martin 303's, pressurized version of the 202. C. Bedell Monro, president of Pennsylvania Central Airlines, told the President's Air Policy Commission that PCA had cancelled the final 20 planes

of its original \$7,000,000 order for 35 model 202's.

Both Patterson and Monro said that financial conditions were at the root of their cancellations. PCA lacks funds to pay for the new equipment it ordered, Monro told the Commission. United attributed its cancellation to delays in delivery dates and a desire to re-examine its requirements in the light of "changes in general economic conditions." United's deliveries were originally scheduled to begin this fall but were later postponed by Martin to next summer. Both the 202 and 303 have undergone major modifications since the first production models were flown.

► **Northwest Tests**—Meanwhile Northwest Airlines was conducting further tests of its original NX Model 202 and the first two certificated planes scheduled for regular service on the line. As a result of preliminary tests, which included failure of the automatic propeller feathering device necessary to operate the plane at full gross loads, several modifications may be recommended by Northwest. Propeller feathering failures were attributed to the micro-switch mechanism which is also giving trouble on the Douglas DC-6 where it is employed to activate nose wheel steering mechanism during landings.

The automatic propeller feathering feature as a means of increasing gross weights of transports is rapidly developing into a storm center in the current safety situation. The device which is used on both Martin and the new Convairliner transports has been approved by the CAA under the transport category regulations. However CAB Chairman James M. Landis has indicated that the CAA—specifically the aircraft and components division of safety regulation headed by Charles Dwyer—may have overstepped its authority in approving the automatic feathering device without proper service testing. Landis also feels that such decisions should be reviewed by CAB.

► **Pilots Object**—Airline pilots have indicated that they do not feel the feathering device offers sufficient safety to warrant increasing the aircraft's gross weight. In the case of the Martin 202 gross weight was increased from 34,500 lb. to 38,000 lb. on the strength of the feathering device. Without the feathering device the 202 cannot meet the category requirements for a 400 ft. per minute climb on one engine. At sea level its performance under these conditions gives a 265 ft. per minute rate of climb.

Northwest has not yet indicated whether it will accept or reject the automatic feathering device but there are strong indications that it will require addition of vacuum instruments to the all-electric instrument panel.

Congressional Group Hears Defense Chief

The joint Congressional Air Policy Committee got under way last week after designating Merrill Meigs as committee consultant, Lt. Comdr. Langdon Marvin as executive secretary, and naming a 15-member advisory council of outstanding industry figures.

A three-hour session of the committee and its advisory staff was followed by a luncheon and conference with Secretary of Defense James Forrestal. Executive sessions with Air Force and Naval aviation chiefs were scheduled. The committee plans to work out an air policy geared to foreign policy and national defense. The group was enlightened on foreign policy, and the possible national defense requirements to buttress it, by George Kennan of Secretary of State Marshall's policy staff at its initial organizational meeting two weeks ago.

After sessions with armed services representatives, the committee's tentative plan is to break up into subcommittees of committeemen and industry advisors to work out programs for the various branches of aviation. Committeemen feel that more will be accomplished by across-the-table conferences with industry representatives than in open hearings at which much time would be spent in the reading of rather elementary prepared statements, but have not ruled out open hearings later on.

Active members of the advisory council include:

Carlton Ward, president, Fairchild Engine and Airplane Corp.; H. M. Horner, president, United Aircraft; Charles Sorensen, former chairman of the board, Willys-Knight; P. M. Litchfield, chairman of the board, Goodyear Tire and Rubber; Gill Robb Wilson, aviation commentator, New York Herald Tribune; Roscoe Turner, president, Roscoe Turner Aeronautical Corp.; Earl Slick, president, Slick Airways; Adm. John Towers, former chief, Navy Bureau of Aeronautics; Gen. H. H. Arnold, former commanding general, AAF; Victor Emanuel, chairman of the board, Aviation Corp.; Ralph Damon, president, American Airlines; Robert Gross, president, Lockheed; J. H. Kindelberger, president, North American; Richard Dupree, president, Procter and Gamble, former chairman, Army-Navy Munitions Board; Joseph Keenan, AFL, representing labor.

Meigs, a Hearst publisher, served as chief of WPB's aircraft division. Marvin served as chairman of the interdepartmental air cargo priorities committee, and is a former member of the White House executive staff.

PRODUCTION PROGRESS REPORT

Companies Reporting to Aircraft Industries Association

	Shipments			Value		
	Jan.-Aug.	Aug.	July	Jan.-Aug.	Aug.	July
Aeronca	1,044	118	69	\$1,973,000	\$203,000	\$132,000
Beech	743	170	155	4,548,000	1,156,000	1,056,000
Bellanca	185	9	15	925,000	45,000	75,000
Cessna	2,090	123	98	4,717,000	291,000	219,000
Engineering & Research	695	52	51	1,799,000	135,000	132,000
Funk	24	5	3	96,000	15,000	12,000
Luscombe	958	113	110	2,452,000	299,000	299,000
North American ..	842	61	40	4,921,000	365,000	212,000
Piper	3,122	150	172	6,981,000	308,000	343,000
Republic	764	16	21	3,651,000	77,000	103,000
Stinson	1,992	165	230	8,465,000	724,000	1,002,000
Taylorcraft	132	15	13	252,000	26,000	22,000
Texas Engineering.	105	22	17	436,000	80,000	51,000
Totals	12,716	1,019	994	\$41,298,000	\$3,724,000	\$3,666,000

Note: Beech value figures do not include Jan., Feb., and March.

All Manufacturers

Month	2-Place	3-4 Place	Transports	Military	Total	Value*
January ..	969	1,176	21	111	2,277	\$53,210,421
February ..	793	1,109	12	99	2,013	56,157,550
March ..	789	972	24	137	1,922	55,363,825
April ...	964	1,042	32	105	2,143	58,505,836
May ...	847	771	28	94	1,740	62,970,218
June ...	590	572	31	139	1,332	90,657,575
July	475	508	15	104	1,102	44,877,858

*Includes aircraft, parts, conversions, all other products and all payments to military contractors during the period. Table based on "Facts For Industry" of the Bureau of the Census.

Lightplane Sales Show Slight Rise In August

AIA report shows August shipments above 1,000 mark; higher than July.

A drastic downward revision in the number of expected sales of three and four-place planes within the next six months features manufacturers' reports on July shipments and backlogs to the Department of Commerce.

On the brighter side, however, are the separate reports of 11 leading personnel aircraft manufacturers to Aircraft Industries Association that August shipments totaled 1,019—back above the 1,000 mark after only one month below, in July.

Commerce Department reported on expected sales of seven unidentified manufacturers of three and four-place planes. In July the backlog of these planes (which under reporting procedure is for the next six months) was 3,753. Shipments in July were 508, yet backlog dropped at the end of that month to 1,378.

Value of total shipments for all manufacturers in July decreased about 50 percent from the June high (see accompanying table), which was due chiefly to lower payments to military contractors. Reason probably is that the

June figure represented an end-of-the-fiscal-year clearing. However, there was a drop in deliveries of both military and civil planes.

A brighter item are the military backlogs reported by the manufacturers. These represent payments expected within the next six months whether or not on complete aircraft accepted. The total military backlog rose in July to \$221,379,325 from the June figure of \$205,948,112.

Number of employees in aircraft plants declined in July, with a cut of nearly 900 production workers partially offset by a 200-plus gain in other plant employees. Total employment in July was 139,600 as against 140,258 in June.

Shipments of aircraft engines rose slightly in number during July—from 1,348 to 1,357—while declining in value from \$33,164,268 in June to \$21,528,858 in July. As in the airframe industry, the drop in value was due principally to lower military payments. Total engine backlog declined from \$210,436,037 in June to \$201,854,105 in July, but expected payments to military customers in the next six months rose from \$137,704,894 to \$144,018,710.

Employed in engine plants during July were 33,140 against 33,967 in June.



WINTER TEST FOR NAVY FIGHTER

This Navy jet plane will undergo severe tests under actual icing conditions at top of Mt. Washington (6,300 ft.) where winter winds have velocities in excess of 75 mph. 60 percent of the time. High winds, together with frigid temperatures, provide excellent testing conditions.

Pilot Strike Halts AOA's Operations

All planes of American Overseas Airlines were grounded last week by a mass walkout of the company's pilots and co-pilots when a strike was called by David L. Behncke, president of the Air Line Pilots Association.

Behncke described the strike as a legal work stoppage called under provisions of the Railway Labor Act after complete breakdown of direct negotiations between the two parties.

A strike vote had been taken Aug. 17 and the 30-day waiting period provided by law ended Sept. 17. Behncke further claimed that AOA pilots spent the following two weeks in a "last-ditch" effort to avoid the walkout.

► **Claims**—Sources claimed that AOA had predicated its willingness to sign a wage agreement on ALPA's willingness to drop grievance cases for individual pilots. ALPA held, on the other hand, that these were unrelated issues involved, which had to be negotiated separately.

From AOA headquarters came word that the strike was a complete surprise to them. Claim was that the company was first informed by the Post Office Department in Washington and through news reports. Confirmation came, it was said, when the pilots failed to report for an early morning flight by AOA to Frankfurt, Germany.

AOA stated that negotiations had been going along fairly well and that conferees were about half through discussions on revision of rules and working conditions. Although the walkout began at 4 a.m., AOA said at 5 p.m. the same day (Tuesday) it had not yet received official union notification of the strike.

► **Not Pay**—ALPA says that pay issues were not involved. Behncke said there were two basic causes for the walkout: AOA's "failure to deal in good faith," and "management's attempt to use signing of an agreement as a bludgeon to force settlement of pilot-company grievances..."

AOA denied that pilot grievances were tied in with the negotiations and contended that the strike was illegal under the Railway Labor Act and that negotiations could not be recommenced until the pilots returned to work and complied with the act to bargain collectively.

While the strike was on, AOA shifted its eastbound trans-Atlantic passengers to other airlines and where possible to westbound carriers.

The latter was more difficult however, since other carriers were heavily booked. Meanwhile observers look for a quiet settlement of the dispute.



Swept Wing XP-86 Readied for Flight

USAF experimental fighter built by North American will test new tactical design.

The U. S. Air Force's first swept-wing fighter, the North American XP-86, was undergoing final preparations last week for its first takeoff flight with veteran North American test pilot George Welch assigned to the task. The new fighter is essentially a modification of the Navy's XFJ-1, although the introduction of the swept wing configuration created extensive design changes followed by a lengthy wind tunnel test program.

The six-ton fighter will be used to explore the tactical possibilities of swept-wing designs, at subsonic speeds up to about 630 miles per hour, mach number .83 under standard conditions. The wing sweep, by moving the center of lift rearwards, necessitated a lengthening of the fuselage nearly four feet with accompanying relocation of the General Electric-Allison J-35 turbojet engine. This increase was made by inserting a fuselage section aft of the cockpit. This additional area permitted the installation of additional fuel in the mid-fuselage region. It was therefore possible to remove the large belly structure of the XFJ-1 and to produce a slimmer, lower-drag fuselage for the XP-86.

► **Duct Difference**—Unlike the Douglas D-558, the XP-86 air intake duct is continuous and passes directly rearward to the turbojet engine compressor inlet. The nose air inlet features on large upper lip extension to furnish adequate air to the engine at high angles of attack (such as during landings). The cockpit floor is located above the air duct and enclosed by a pressurized bubble canopy.

The swept back configuration of the wing and tail surfaces of the XP-86 is designed to increase the critical speed of these surfaces and thereby permit the airplane to fly faster before encountering serious compressibility difficulties. The drag of a swept wing is always

less than the drag of the same wing unswept, and decreases with an increase in sweepback. This same principle renders control surfaces on a swept wing less effective and the ailerons of the XP-86 are considerably larger than its companion XFJ-1 design. This feature is designed to preserve lateral control at the high angles of attack associated with low speed flight. The tip stall hazards of swept wings create the need for large ailerons.

► **Dive Brakes**—A feature of the 37-ft. (both span and length) fighter is fuselage "dive brakes" first revealed on the D-558. These are large panels mounted flush on the aft fuselage and extended out into the slipstream to create a heavy drag. However these brakes are primarily for deceleration during level flight such as the landing approach or when maneuvering in the air.

High altitude capabilities of the XP-86 are evident from its operating ceiling of well over 40,000 ft. Its speed at high altitude, however, is reduced to about 550 mph. due to the lowered temperature and speed of sound limitation.

Armament of six .50-caliber machine guns is grouped in the nose, three guns on each side firing through louvers around the air intake. Heaviest hitting power of the new fighter is its wing armament, containing provisions for a large variety of bombs, rockets, depth charge and smoke tanks.

► **Contract Details**—Air Force contract with North American, negotiated in the early fall of 1944, specifies the delivery of two experimental prototype XP-86 and one static test model. Quantity production of the radical new fighter will hinge on the outcome of performance and stability tests at Muroc Air Base but this test program will require 12-18 months and more advanced types will be matured by that time. However, the XP-86 provides the Air Forces with its first swept wing flight test article for military combat research as contrasted to the aerodynamic research purpose of the Bell and Northrop XS series.



Positions in the new Department of Air were filled recently when Pres. Truman appointed Eugene M. Zuckert (left) and Cornelius Vanderbilt Whitney (right) as assistant secretaries and Arthur S. Barrows (center) as undersecretary of the Department.

Air Force Names Top Policy Group

U. S. Air Force moved rapidly last week to get its top level policy making organization under way.

Gen. Carl A. Spaatz, post-war commander of the Army Air Forces, was named USAF chief of staff and Secretary W. Stuart Symington named three of his top level assistants. They are: Arthur S. Barrows of Chicago, as undersecretary of the Department of Air Force; Cornelius V. Whitney and Eugene M. Zuckert, both of New York, as assistant secretaries.

► **Procurement Specialist** Barrows was formerly president of Sears, Roebuck & Co. and more recently served as economic adviser to the American occupation forces in Germany. His main job with the Air Force will be procurement.

Whitney served as an air officer in both wars and was a director of Pan-American Airways for many years. He has disposed of all his PAA holdings. Whitney's main concern will be with external liaison of the Air Force dealing with State Department, ICAO and other civil aviation agencies.

► **Public Relations Shift**—Zuckert, a former Harvard business school teacher and attorney for the Securities and Exchange Commission, will be Symington's administrative assistant concentrating on internal Air Force problems such as budget, manpower, etc.

Brackley Shaw, New York attorney who was legal adviser to Symington in the old War Department, will be general counsel for the Air Force department.

Another top policy change involves transfer of the entire Air Force public relations staff to the office of the secretary where it is headed by Stephen

Leo, a former newspaperman and AAF veteran. Under Leo, Brig. Gens. Emmett O'Donnell and John Gerhart will handle air information and legislative liaison respectively.

Controversy Stirred By New CAA Bill

A spirited three-party tiff involving Commerce Secretary W. Averill Harriman, CAB Chairman James Landis and CAA Administrator T. P. Wright over the two major provisions of the Omnibus Brewster bill—separation of CAA from the Commerce Department and the lodging of all air safety regulatory and enforcement functions in CAA—is underway.

Wright has expressed enthusiasm for both provisions to interested Congressional circles.

There are indications that he inspired them.

Harriman is in vigorous opposition to the proposal to cut away CAA from his department and give it autonomy similar to that now enjoyed by CAB, and Landis has registered his opposition to the CAA-supported proposal of the bill removing all safety regulatory functions from his board.

Congressional observers point out the Brewster bill would mean loss of control of approximately 50 percent of Commerce Department's current budget. A Commerce Department report opposing independence for CAA is expected to clear the Budget Bureau and reach Capitol Hill by the January convening date of the next session.

The Brewster bill's proposal on CAA-CAB organization appears to have more substantial Congressional support than the McCarran proposal for a three-agency set-up—a CAA, CAB, and independent air safety board.

Research Sponsorship Question Resurrected

Conflicting views expressed by helicopter manufacturers and the personal plane manufacturers on the subject of government sponsorship of development projects for improving their products gave the President's Air Policy Commission last week a problem for study to develop an ultimate recommendation.

Dwane Wallace, Cessna Aircraft Co. president and only lightplane manufacturer speaking as such at the hearings, pointed out that despite the present lightplane slump the lightplane manufacturers had rejected the proposal of William A. M. Burden, then assistant Secretary of Commerce for Air, that appropriations of \$5,000,000 be sought to finance technical development projects leading to improved personal planes and helicopters. The proposal was rejected, Wallace said, because the industry considered CAA a regulatory agency and felt that it should not engage in developments which might become involved in further regulation.

► **Reject Offer**—"You mean the industry turned down five million dollars on that principle?" asked Chairman Thomas K. Finletter. "The principle must have been awfully good."

Wallace replied that the industry considered that there was "too much government in the personal plane business now," without opening the way to more. He said, however, that industry was interested in possible Army ground force and NACA development contracts which might be applied to personal planes.

Lawrence Bell, president of Bell Aircraft Corp., Buffalo, and chairman of the helicopter council of Aircraft Industries Association, told the Commission that the helicopter makers would be glad to have government sponsorship of helicopter development.

► **Praise NACA**—Both Bell and Igor Sikorsky, engineering manager of Sikorsky Aircraft Division, United Aircraft Corp., Bridgeport, Conn., praised the work of the National Advisory Committee for Aeronautics on helicopter research as far as it had gone, but described it as a small amount of research compared to what was needed.

Sikorsky defined a minimum production for a helicopter company as approximately 75 to 100 government contract helicopters a year plus one experimental contract, during the early development stages of the industry when commercial helicopters cannot be produced in volume sufficient to be profitable. Between two and six companies are needed, he estimated, as production sources for national defense uses of the helicopter.

AVIATION CALENDAR

Oct. 6-7—New York State Aviation Council meeting, Rochester, N. Y.

Oct. 6—International Air Transport Association, executive committee, Rio De Janeiro.

Oct. 7—International Air Transport Association, traffic committee, Rio De Janeiro.

Oct. 9-11—Air Line Dispatchers Association annual convention, Chicago.

Oct. 10-13—Southern California National Air Races, Long Beach, Calif.

Oct. 14-16—Army-Navy-Industry technical meeting on power plant and propeller standardization, Wright Field, Dayton, Ohio.

Oct. 14—International Air Transport Association, third annual general meeting, Petropolis.

Oct. 15-18—Montreal Board of Trade, second annual air conference, Montreal.

Oct. 18-24—29th annual National Metal Congress and Exposition, Chicago.

Oct. 20—International Air Transport Association, executive committee, Petropolis.

Oct. 20—Air Industries and Transport Association of Canada, annual meeting, Gray Rocks Inn, St. Jovite, Quebec.

Oct. 24-26—"Air Day in Texas" aviation show, Harlingen, Texas.

Oct. 26—Dedication ceremonies renaming Miami International Airport as Amelia Earhart Field, Miami, Fla.

Oct. 26-28—National Association of State Aviation Officials, Fort Worth, Texas.

Nov. 4-7—National Airport Show and Institute, sponsored by Air Foundation and National Aeronautic Association, Municipal Auditorium, Cleveland.

Nov. 6-7—Fuels and Lubricants meeting, Society of Automotive Engineers, Hotel Mayo, Tulsa, Oklahoma.

Nov. 10-22—Fifth Annual National Aviation Clinic, Springfield, Ill.

Dec. 1-3—Air transport meeting, Society of Automotive Engineers, Hotel Continental, Kansas City.

Dec. 1-3—Fifth annual meeting, Aviation Distributors and Manufacturers Association, Hotel Adolphus, Dallas, Texas.

Dec. 4-6—Society for Experimental Stress Analysis, annual meeting, Hotel Pennsylvania, New York.

LaGuardia Field Profits Under Authority Guidance

The New York Port Authority has announced that revenues from the operation of LaGuardia Field during the first three months of its operation by the authority are running a third above estimates, substantiating the authority's claim that the port could be self sustaining.

Progress has been made on plans to stop the sinking of the eastern end of the field. Contractors are studying suggestions for filling the south half of Bowery Bay for an extension of the east-west runway, so operations will not be suspended while the eastern end is being saved. Bid for this work will be let sometime in October.

Other improvements at LaGuardia by the authority: Two new taxi strips to cost \$60,000; five wind cones for installation near takeoff points, and repairs to the wind tee, which has been out of order for several years. Many changes have been planned for the field's operation and maintenance.

INDUSTRY OBSERVER

► Douglas spokesmen say they can have the DC-9 available in 1949 provided they get a "go ahead" within the next three months. In addition to scheduled airlines, All American Aviation has evinced interest in the feeder line possibilities of the type.

► First Hawker jet type, a Royal Navy fighter, has passed flight tests successfully at Boscombe Downs. The N.7/46 is powered by a single Rolls-Royce Nene II turbojet engine of 5,000 lb. static thrust.

► A comprehensive report detailing plans for a \$1,000,000,000 aeronautical engineering center is scheduled for consideration by the military establishment's Research and Development Board, headed by Dr. Vannevar Bush, at its first meeting, probably late this month. The main feature of the center would be wind tunnels for testing full-size supersonic planes and guided missiles.

► American Airlines will convert six more Douglas DC-4 transports to cargo planes, making a total of 12 all-freight DC-4's in AA service.

► Trans-Canada Air Lines has taken delivery of the first of 20 pressurized North Star transports being built by Canadair Limited, Montreal. Powered by four Rolls-Royce Merlin 620 engines, the 40-passenger transport recently averaged 314 mph. to set a new west-east Atlantic speed record.

► While American safety authorities are still pondering the safety problems of gust locks as a result of the United Air Lines DC-4 crash at LaGuardia Field last May 29, Canadians point out that their safety regulations required gust locks to provide unmistakable warning to pilots when the lock is on and to make it impossible to the aircraft to begin take-off if the lock is engaged. These regulations have been effective since October, 1946.

► Bartow high intensity runway and approach lights will be installed on China's three main commercial airdromes, Shanghai, Hangchow and Canton.

► Chinese government is negotiating for purchase of about 150 surplus RCAF Mosquitoes at about \$10,000 apiece. It is believed the Chinese plan to use them for combat operations with the Chinese Air Force.

► USAF expects to assign the first tactical versions of Convair's XB-36 to the Eighth Air Force sometime during November. Cadres of Eighth Air Force personnel are now taking special training on the giant bomber at Fort Worth and will serve as instructors within their command.

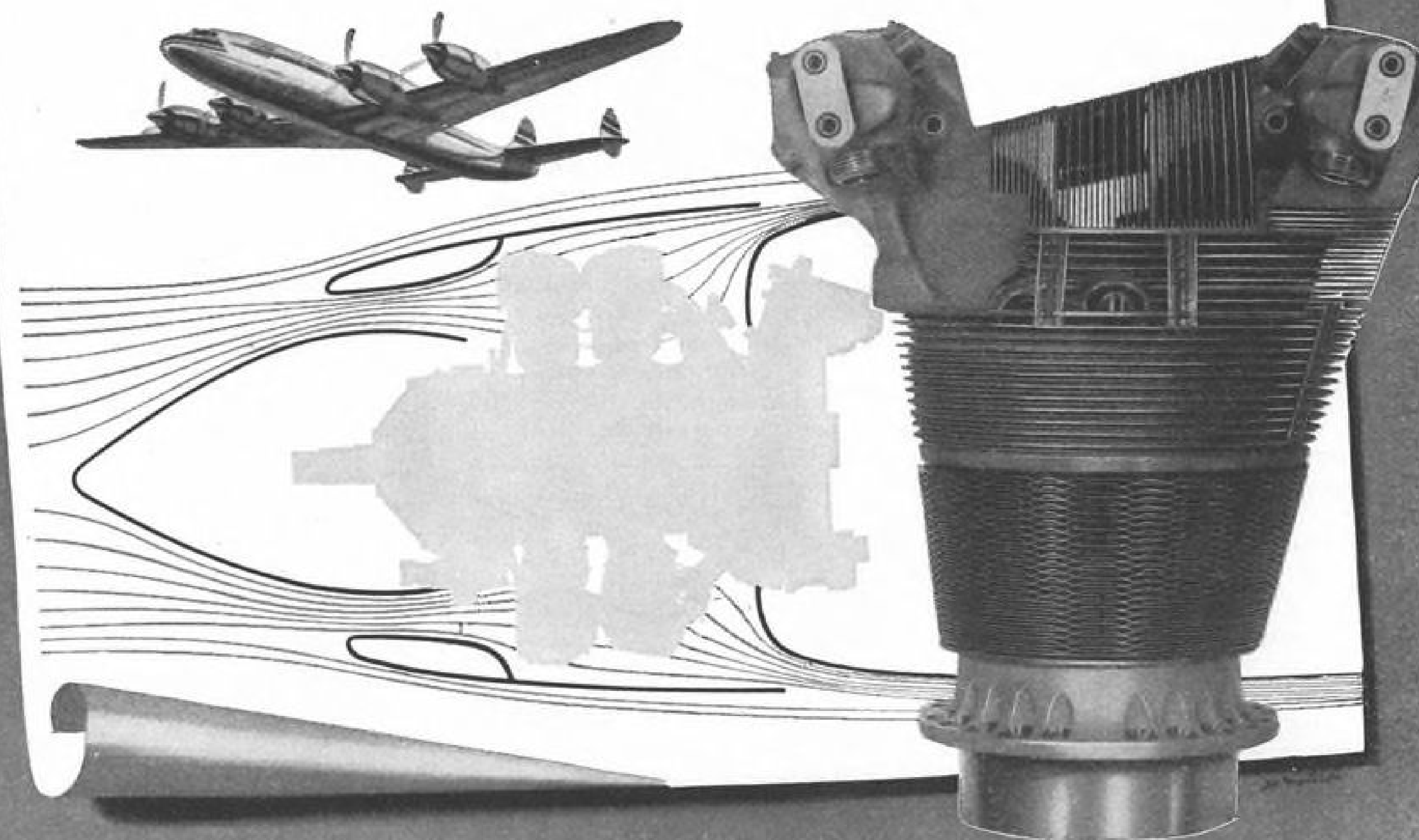
► Thompson Trophy triumph of Cook Cleland's Goodyear-built F2G-1 can be shared by the Chance Vought personnel who modified the war surplus plane for racing. Among the changes made at Chance Vought were removal of wing folding device; replacement of standard fibre wing tips with streamlined balsa that reduced span by two feet; sealing of gunports with dural; replacement of standard rudder with smaller F4U rudder and vertical stabilizer. Armor plate was cut away to leave only anchors for safety harness straps. Two special tanks one for gas and one for water used in water injection were added behind the pilot's seat. Radio equipment, carrier hook and tail wheel were removed with a completely retractable tail wheel substituted. The plane was also equipped with a specially thinned and polished Hamilton standard propeller. Chance Vought workers accompanied the plane to Cleveland and directed Cleland's mechanics in servicing the Corsair there.

► Cargo version of the Douglas DC-3 will add a 7,000 lb. speedpak cargo container to bring the gross weight up to 100,000 lb.

► Fairchild Airplane & Engine Co. is working on design of a four engine transport with demountable fuselage for military use.

► Boeing is developing a new and larger heavy bomber, the XB-52 to be powered by turboprops, according to Boeing President William M. Allen. He also revealed that Boeing is now building prototype of the B-50C a greatly improved version of the original B-50 now in production. Company's USAF contract on the XB-47 calls for two bombers plus spares at a cost of \$10,500,000.

50% less "cooling drag" with new WRIGHT cylinder design



WRIGHT AERONAUTICAL CORPORATION

WOOD-RIDGE NEW JERSEY



A DIVISION OF
CURTISS WRIGHT
FIRST IN FLIGHT

■ Now used on all Cyclone engines, the new Wright cylinder (forged aluminum head and steel barrel with aluminum fins) is scientifically designed to provide finning for more effective and uniform heat dissipation.

This new design, inherently stronger because of the forged head, reduces engine cooling requirements so that loss in airplane performance due to "cooling drag" has been reduced by more than 50%.

To the operator the combination of greater power and improved airplane performance resulting from the new Wright cylinder design means faster airplane speeds at lower operating costs.

POWER FOR AIR PROGRESS

FINANCIAL

Losses Make Insurance Companies Leave Personal Plane Market

Condition is seen as temporary however, with business again being desirable when necessary adjustments are made in the field.

A high rate of insurance losses may prove a serious deterrent to the personal plane market. The accident experience in the lightplane field has caused widespread cancellation of bad risks wherever possible. Moreover, despite sharp increases in premium rates, the insurance companies have failed to discourage this type of business and aggregate losses are alleged to be outdistancing total premium income.

Most personal planes are purchased on credit and financed through banks or similar agencies. The strongest bulwark to such credits is the insurance covering the planes. Without such protection, no loans will be extended by any credit agency. Yet, based on a past high accident rate, premium rates have increased sharply and have become a major factor in computing the plane's operating costs. For example, since April of this year, hull insurance has been increased 15 percent, passenger liability 25 percent and property damage and public liability 50 percent. Typical coverage at existing rates comprise some 20 percent of the original purchase price for most planes.

► **Capital Is Factor**—Another factor which is currently restricting the volume of insurance being written and tending to confine coverage to a finer risk pattern, is the limited capital and reserves of the insurance companies. Under the various state insurance regulations, the total volume of business written can not exceed a certain percentage of invested capital and reserves. Many insurance companies are being faced with this limitation and, for this reason, are attempting to augment their capital resources so that they can write more insurance.

At the present time, the annual volume of aviation insurance being written is estimated to range between \$15 million and \$20 million. The bulk of this insurance is in the personal plane field and reveals the magnitude of business available.

In his authoritative appraisal of the personal aircraft market, CAA Administrator T. P. Wright continues in his

forecast that by 1955 or thereabouts, there will be about 400,000 registered civil aircraft in the United States, with an annual production at that time of personal aircraft of the order of 150,000. In the analysis of recent sales by original purchasers, Mr. Wright disclosed that 55 percent of such transactions were attributed to financial reasons. It is therefore essential to have a firm basis of financing personal plane sales if volume markets are to be attained. And without the proper insurance coverage at low cost, the necessary financing will be difficult to secure.

► **Cost May Level**—It is likely that this present period of high cost insurance may only be temporary and we may be in a "leveling-off" era with a gradual decline in the offing. Mr. Wright includes increased safety features as a must in the development of personal aircraft markets and it is this feature which, in time, may be expected to reduce the accident rate in this field and which will ultimately lead to lower insurance costs. Reduced insurance costs, in turn, will make possible lower operating charges and will serve as a stimulus to broader markets.

In the meantime, the aviation insurance underwriters serving the personal plane field have been reported as taking substantial losses in this activity. At present, there are three main groups competing for this business: Aero Insurance Underwriters, the United States Aviation Underwriters and the Associated Aviation Underwriters. At the end of hostilities there were about a dozen new companies and a threat of British combines who jumped into aviation insurance underwriting. Great expectations were seen immediately in the personal plane field, and drastic rate cuts were imposed. This forced the old-line groups to follow suit. As a result, considerable business was written at a loss in view of the subsequent mortality rate. This led to the gradual withdrawal from the field of various companies and the remaining newcomers are reported as seeking re-insurance if it can be arranged. The three main syndicates

remain comparatively stable after boosting their rates to higher levels.

► **Change May Develop**—A drastic change, however, may develop in next year's domestic competition when a large group of companies is scheduled to withdraw from one underwriting syndicate, effective January 1, 1948. The withdrawing group of companies will take with it a large portion of established business. The impact of this move is difficult to ascertain at this time other than that it may again serve to intensify competition.

A definite trend is evident in that the older and more experienced underwriting groups are again taking command of the aviation insurance field. For a time, their supremacy was being strongly contested by the newcomers who were very optimistic in their near-term predictions. However, their initial experiences have been unprofitable and the economic facts of life have dictated adjustments.

The three main syndicates are unique in that they issue no insurance policies directly but are merely service organizations. For example, Aero Insurance Underwriters is comprised of some 36 fire and casualty companies and has complete jurisdiction over all aviation insurance transacted by these constituent companies in the United States. These separate companies are, for the most part, stock corporations and are of American and British registry. Insurance policies issued can be from any of the constituent companies with an arrangement of inter-reinsurance making the resources of all the companies available for payment of losses.

As service organizations, these syndicates attempt to provide the best possible underwriting, field and claim service on aviation risks. This procedure has been found far more feasible and economical than the maintenance of separate service organizations by each of the constituent companies.

► **Syndicate For Safety**—Each syndicate, particularly Aero, also attempts to promote increased safety in aviation and maintain extensive engineering departments for this purpose. Frequent bits of advice are made available in the form of booklets, articles and speeches. All groups attempt to be helpful to bankers and others who may be concerned with the production and sale of aircraft. In this manner, wider markets for underwriting aviation risks are attained.

At the present time, underwriting personal aircraft insurance is unprofitable but is a condition that is hardly expected to prevail indefinitely. With current adjustments being made, this volume of business should again be very desirable and profitable and form an integral part in promoting the increased production of light planes.

—Selig Altschul

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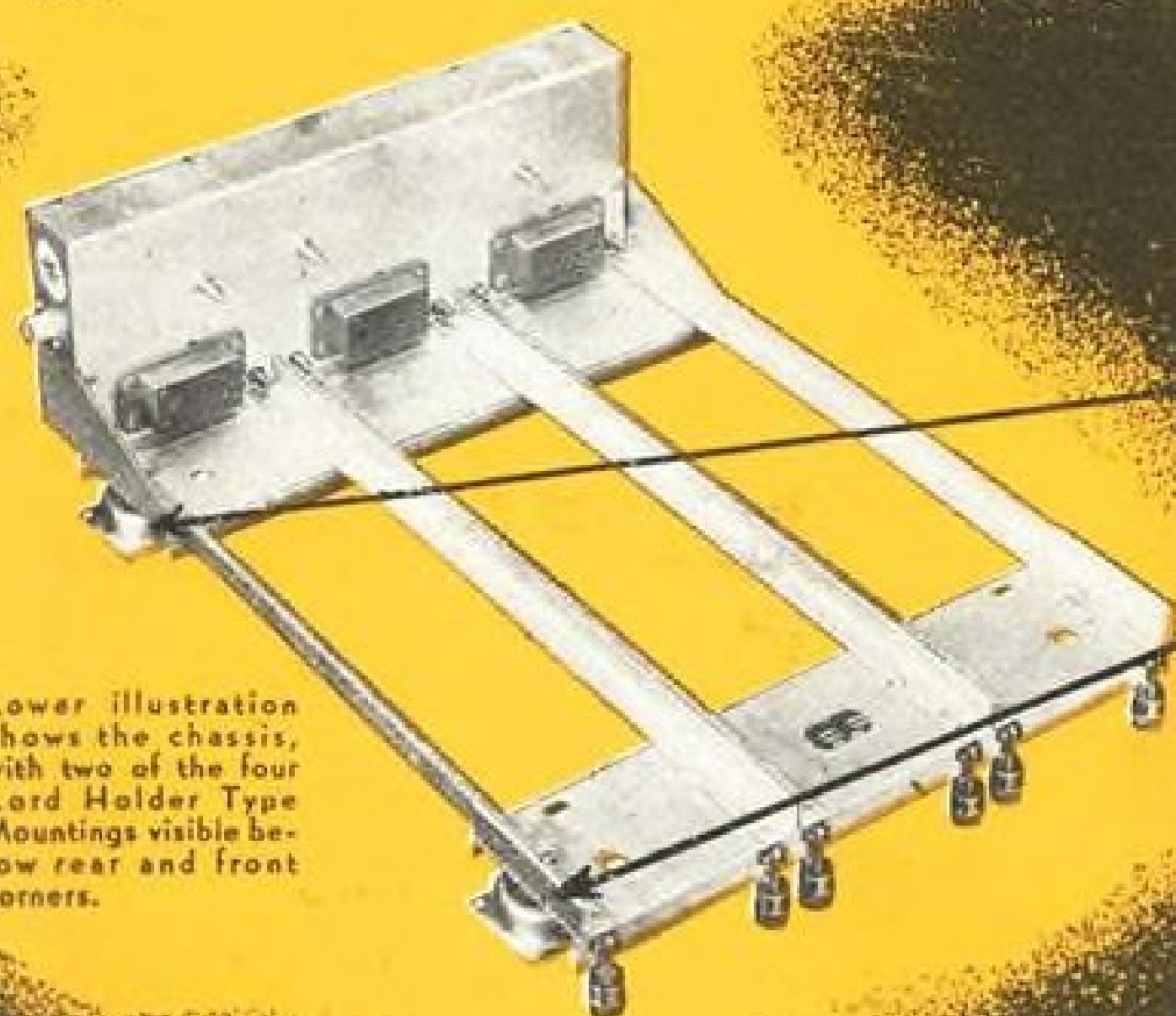
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ENGINEERING & PRODUCTION

British Show Spurs New Export Drive

Wide range of military and civil aircraft types impresses foreign visitors.

By **FREDERICK R. BREWSTER**
(McGraw-Hill World News
Correspondent)

LONDON—The vitality of the British aircraft industry and the enormous scope and variety of its activities were the most striking impressions made upon the 876 foreign visitors to the eighth exhibition and flying display arranged by the Society of British Aircraft Constructors at Radlett Aerodrome just outside London. For the rest of the 6,000 guests, it was heartening proof that British aviation is still able to make a "good show."

The accomplishments of a year of steady progress and the plans and models for several promising years to come were strikingly paraded by the 64 different full-scale planes (43 of which were also demonstrated in flight) and by more than 20 more types shown in mock-up and scale-model in the static exhibition.

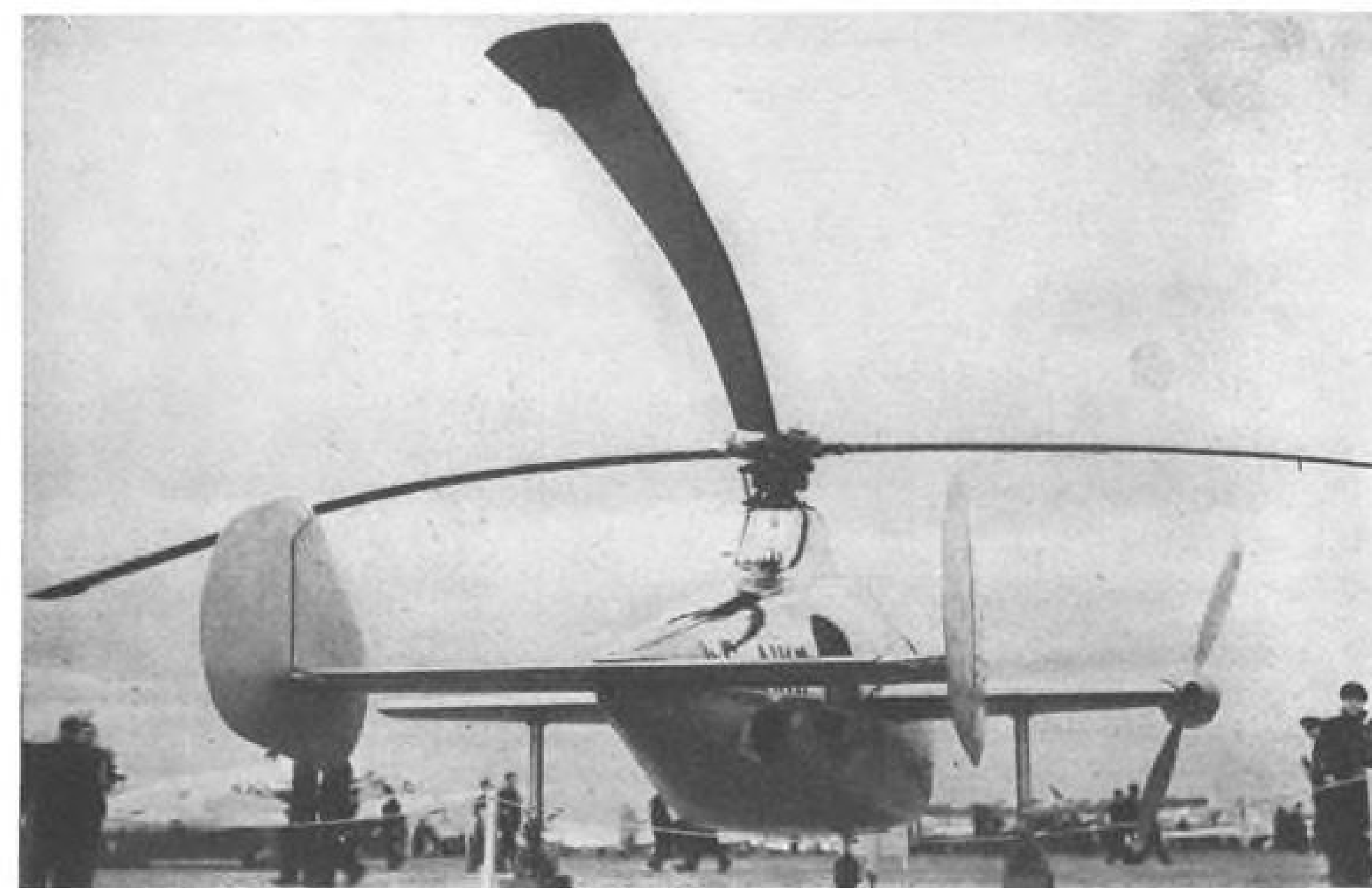
In all, 27 new planes introduced since the exhibition a year ago were on display, most of which were only models last year but which have now been brought along to flying prototypes and even, in a few cases, production models.

► **Meeting Export Target**—An added emphasis to the display's export-promotional function was given by the announcement by Sir Stafford Cripps, president of the Board of Trade, that the export sales target for the aircraft industry, now bring nearly \$80,000,000 a year in orders, had been raised to about \$8,000,000 a month, to be reached by mid-1948, and to about \$10,000,000 a month, or an annual rate approximately \$120,000,000, to be attained by the end of 1948.

Against the background of this urgency was unrolled the pattern of British aeronautical progress. It contained no very spectacular new items—these had been announced and revealed one-by-one throughout the past year. There were no new jet-engined planes side-by-side with the Vickers-Armstrong Attacker (which stole the show last year), the Gloster Meteor IV the DeHavilland Vampire and D. H. 108, or Swallow,—



Fairey Gyrodyne helicopter, soon to make its first flight. (INP Photo)



Rear view of Fairey Gyrodyne. (Keystone Photo)

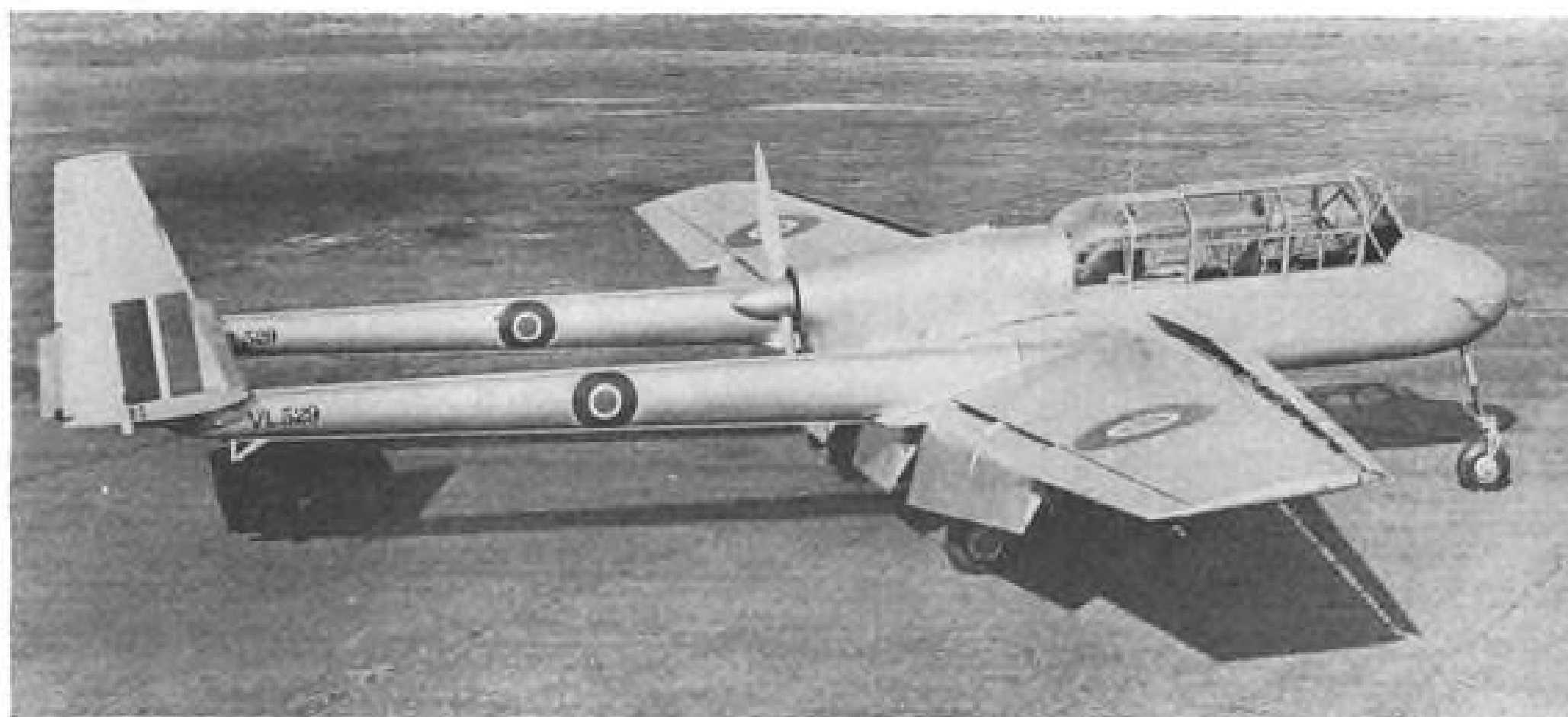


Percival Proctor VI floatplane. (Topical Press Photo)

AVIATION WEEK, October 6, 1947

ENGINEERING-PRODUCTION

21



Heston Aircraft's A2/45 two-place artillery observation plane. (World News Photo)



Newbury Eon, new lightplane in the show. (British Combine Photo)



Avro Tudor VII. (British Combine Photo)



Handley-Page Hermes II. (World News Photo)

but Hawker Aircraft did mount a small model of its new jet-engined fighter, N7/46, which has flown (Sept. 2) but which is still on the Admiralty's secret-list. Only details available on this plane are that it will be powered by a single Rolls-Royce Nene turbojet, will be a low-wing fighter of conventional wing-plan (similar to the Fury and with straight leading-edge) and tail assembly, with a tricycle landing gear.

Only models could be shown of Britain's future jet-powered civil transports: A. V. Roe's Tudor VIII, which has four Nene turbojets in pairs in two double-width nacelles, and Bristol's Brabazon 1 which will have, in its second prototype, eight proteus gas turbines geared into four propeller-driving gear-boxes. Even Armstrong-Whitworth's A. W. 52 jet-powered flying-wing was present only in model form, as the full-size research aircraft was en route to Boscombe Down for testing purposes at the time of the exhibition.

► **Transports**—But there were plenty of new planes of more conventional power plants in all sizes from the large civilian transport to the tiny personal plane. Prominent among the new transports, shown publicly for the first time at Radlett, were Handley-Page's Hermes II, 40-63 passenger version of the R.A.F.'s Hastings, Avro's Tudor VII, 40-60 passenger medium-range plane (with four Bristol Hercules engines in place of the Merlins in the Tudor II, to which it is otherwise generally similar), and Airspeed's Ambassador, a 40-passenger all-metal twin-engined 300 mph. shorter-range transport whose smoothly-tapering lines and triple-finned tail assembly make it resemble the Constellation. (This last design is said to have evoked from Martin's W. K. Ebel the relieved remark: "I'm glad we don't have that competing with our 2-0-2 in America.")

Other new British transport planes introduced during the year and shown off to advantage at Radlett were the Cunliffe-Owen Concordia, Portsmouth Aerocar, Percival Merganser, and Miles Marathon, all in the feeder-route category, the cargo-carrying Aerovan and Merchantman, designed by Miles to compete with Bristol's freighter, and the same firm's novel M. 69, which features a detachable center-section of its box-like fuselage.

► **Military**—But British aviation has also taken good care of the needs of the services. There were three interesting "artillery observation post" designs worked out by different firms to the same general requirements. Heston aircraft unveiled its A.O.P. #A 2/45, which employs a pusher propeller and a twin-boom tail assembly in its all-metal construction, and a long narrow cockpit which places both of the crew forward of the leading edge of the wing, and gives almost com-

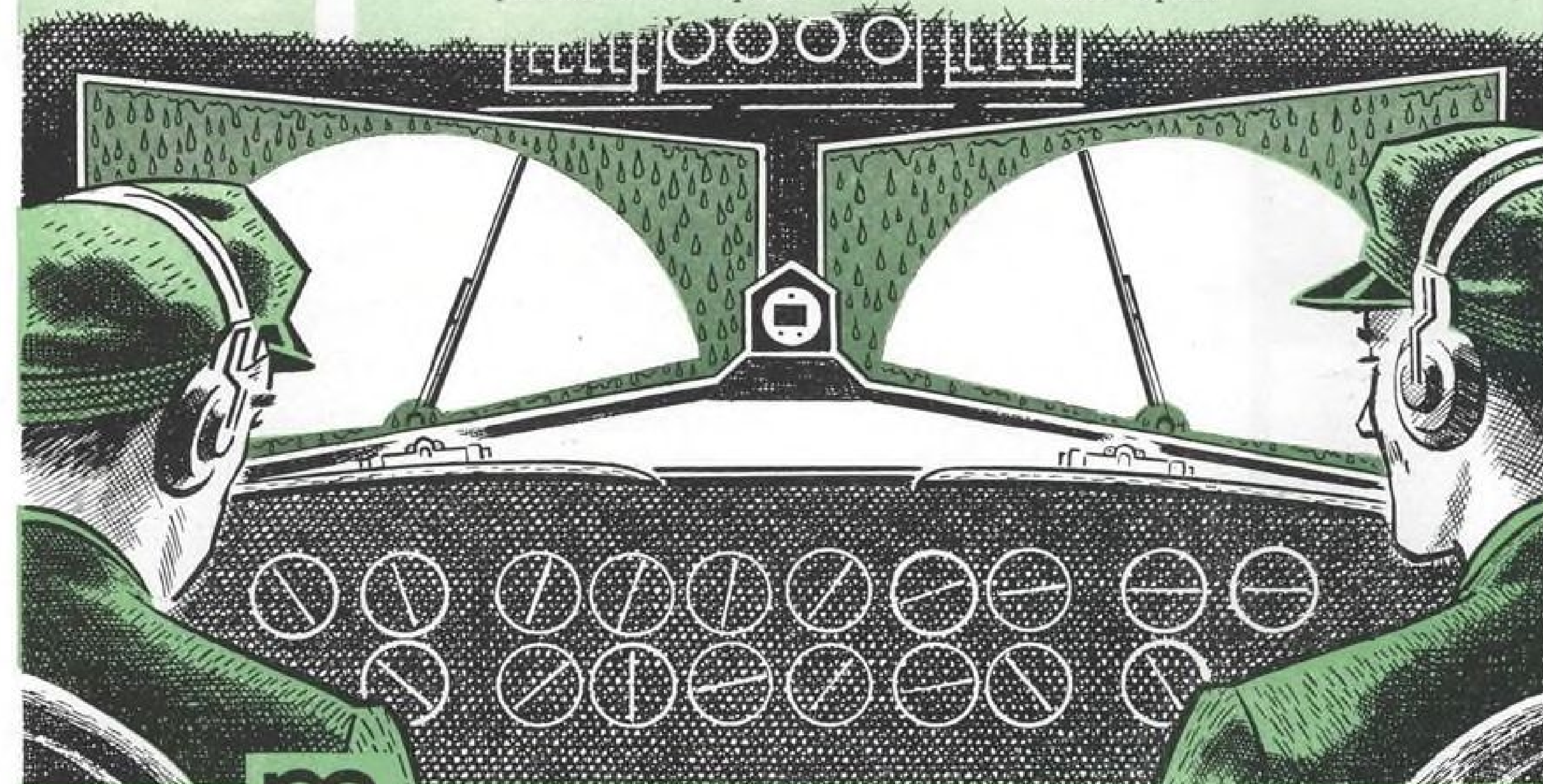
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pletely unobstructed visibility. Downward vision is improved by bulging the sides of the cockpit canopy outward. High-lift slow-speed flight is provided by fitting large slotted flaps to the trailing edge and full-span slots to the leading edge of the wing. A Gypsy Queen 33 in-line air-cooled engine delivers 240 bhp., and the plane has a tricycle landing gear.

Auster displayed its Mark VI A.O.P., which has been in use for some time, a four-seater high-wing monoplane of conventional lightplane appearance and of composite construction. And for further contrast, Scottish Aviation displayed its all-metal 3-4 seater A.O.P., with conventional square-tipped wings fitted with full-span slots on its leading edge and large flaps on the trailing edge, and conventional tail-down fixed landing gear. (This design has yet to fly, and was trucked into the aerodrome.)

► **Training**—Training planes were well-represented, chief innovation being the Boulton-Paul P.108 low-wing three-seater, which will eventually be fitted with a turboprop engine, to give it the maximum performance for its function as an advanced training plane for both R.A.F. and Admiralty aircrews in gunnery, bombing, navigation, photography, target-towing, and both day and night flying. Fairey Aviation's Firefly 2-seat trainer and Vickers-Armstrongs' Spitfire 2-seater showed how the original operational versions had been successfully modified to carry an instructor.

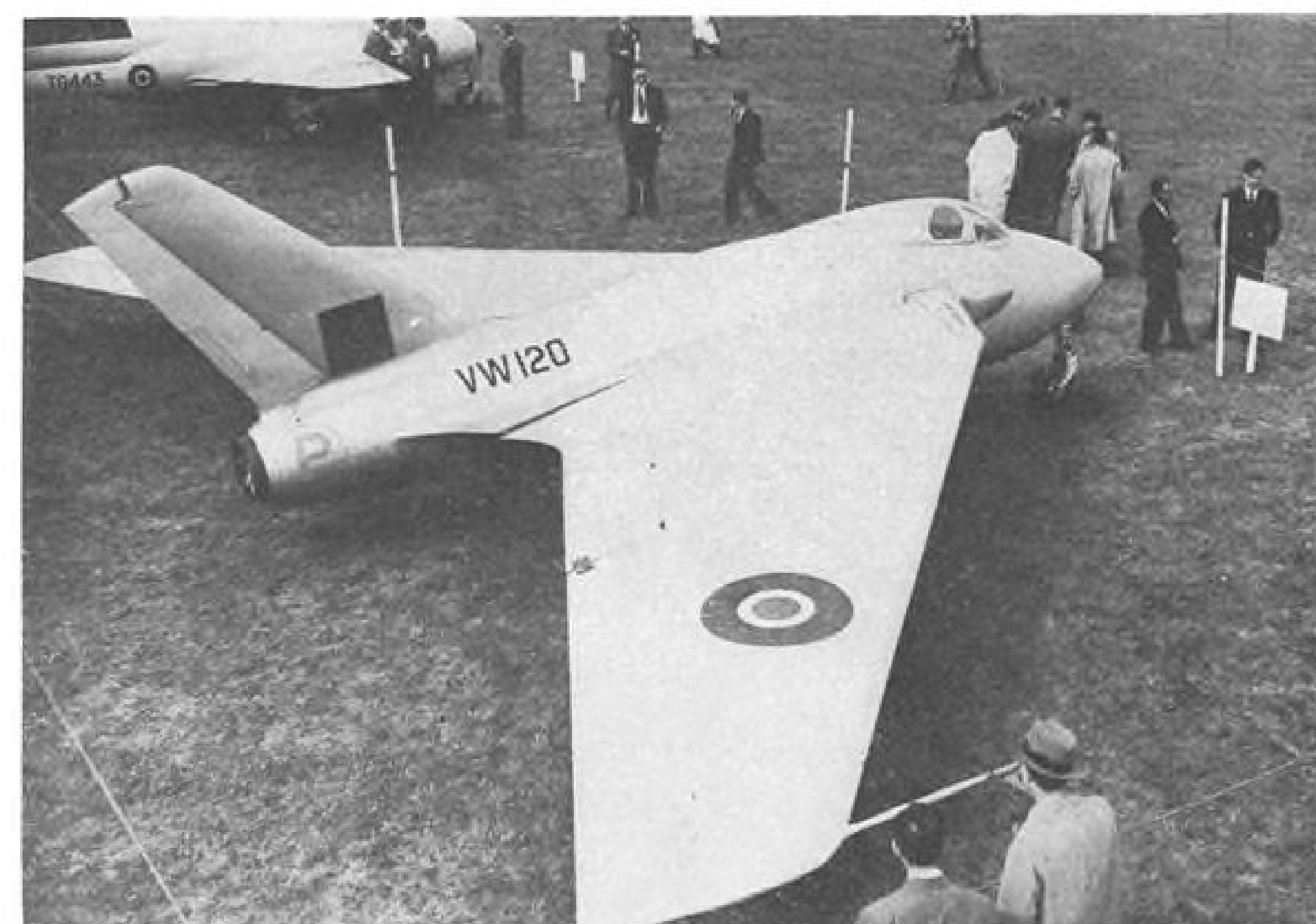
For future appearance and shown only by models are the Avro Athena, a low-wing 3-seat advanced trainer of exceptional performance, to be powered by either a Mamba or a Dart 1,000-hp. turboprop engine; the Hawker Fury 2-seat trainer; and the Percival Prentice 3-seat version.

Missing from the exhibition—but still widely discussed—was the Saunders-Roe jet-engined seaplane fighter, which made its first flights recently at Cowes but which has not yet chalked up the requisite 10 hours flying-time the Air Ministry insists upon before allowing a plane to perform at an exhibition.

► **Helicopters**—New British helicopters were represented at the exhibit in full-scale aircraft only by the Fairey Gyrodyne, a four-seater built to Ministry of Supply requirements, and which attempts to solve the problem of torque-reaction and directional control by means of a tractor airscrew mounted at the starboard end of its stub wing. The Gyrodyne was shown as a model at the Paris air show last fall but Radlett was its first public appearance full size. It is just about ready to make its first flight, and is expected to have a cruising speed of 100 mph., range of 230 mi., and an absolute ceiling of 18,000 ft. An Alvis Leonides radial engine provides 525 hp.



Scottish Aviation's artillery observation plane. (INP Photo)



New view of D. H. 108. (British Combine Photo)

Scale models of two whopping-big Cierva helicopters were on display, the larger of which, the W.11, (to carry 24 passengers and a crew of 2 and with a useful cargo payload of three tons) is expected to be completed by the end of the year. This being built for the Ministry of Supply, will have a range of 230 miles and reportedly will be the world's largest 'copter. This design is a development of the original "air horse" and, like it, makes use of a three three-bladed rotor arrangement, all three rotors (47 ft. in diameter) being driven from a single 1650 hp. Merlin engine.

Cierva is also preparing, for completion six months later, a smaller but similar model, the W.12, with a payload of 1 1/2 tons or 12 passengers in addition to the crew of two. This will have three 36-ft. rotors, and be powered similarly from a central power source

comprising two 550-hp. radial engines.

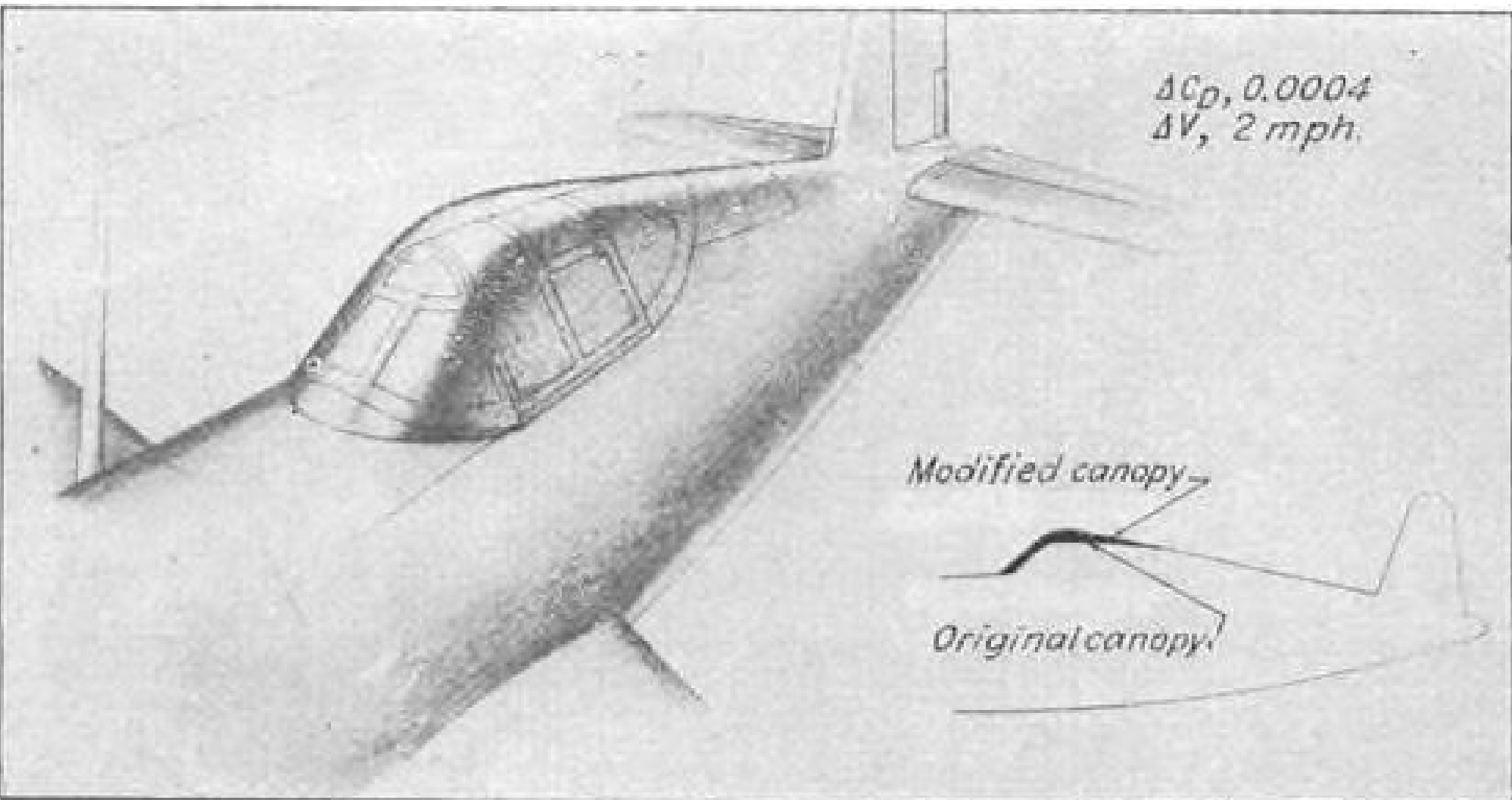
Missing from the show were Bristol's model 171 helicopter, which has flown but which the company chose not to present at Radlett, and the American-designed Sikorsky S-51 which Westland Aircraft Ltd. have been licensed to construct in the U. K.

Less strongly represented by new designs were Britain's light-plane builders, the only new design on exhibit and ready to fly being the Elliotts of Newbury Eon, a low-wing three-seater plywood-sheathed conventional design with a Blackburn Cirrus minor in-line air-cooled engine and a tricycle landing gear. Auster Aircraft, by hard work at the finish, managed to assemble right at the Aerodrome a prototype of their new four-seater Avis, which is simply a civil version of their A.O.P. Mark VI, with a D. H. Gypsy Major engine.

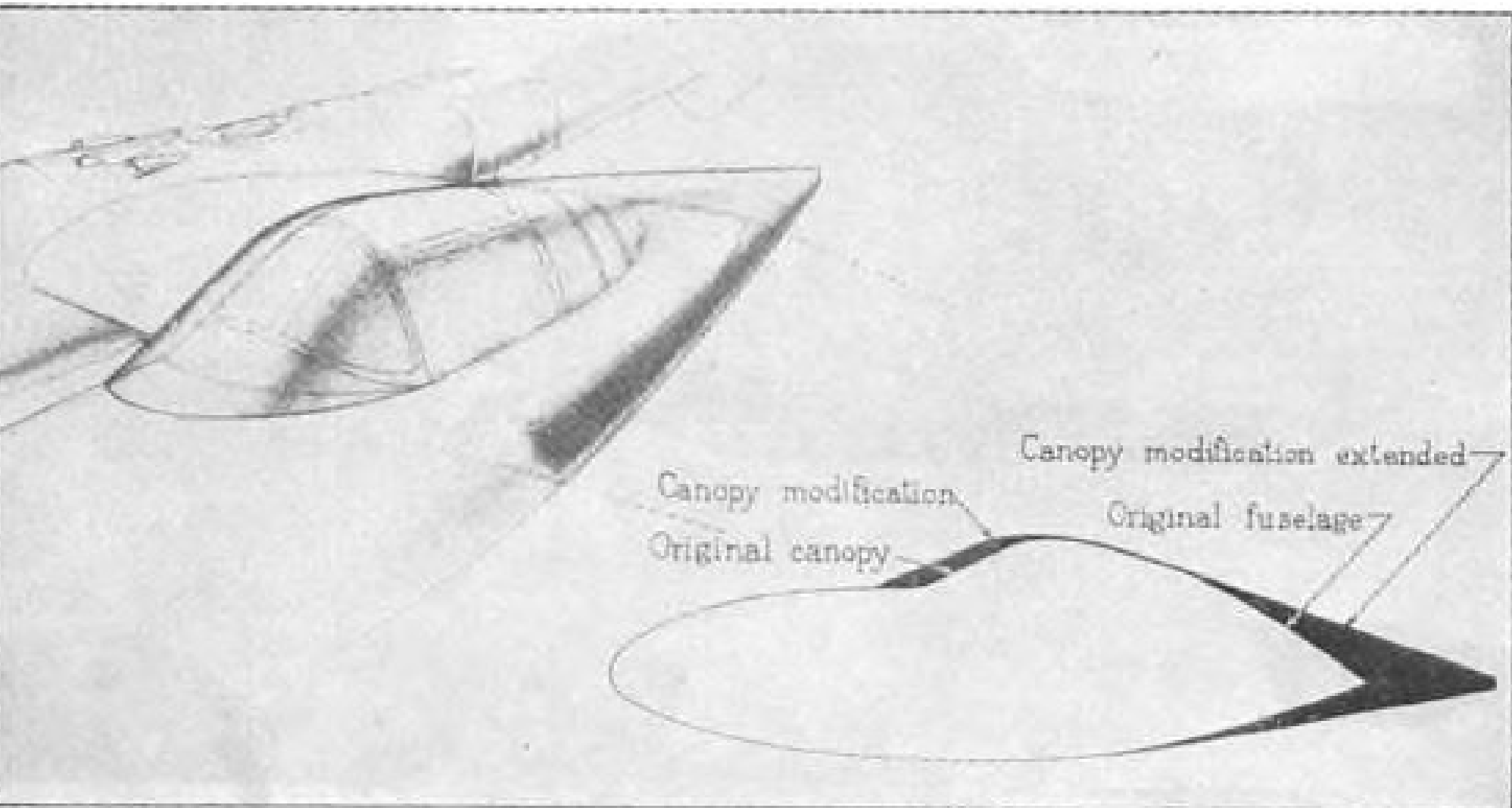
Searching Drag Studies Check Speed Impeders

Effects of canopy modifications and radio antenna installations are analyzed.

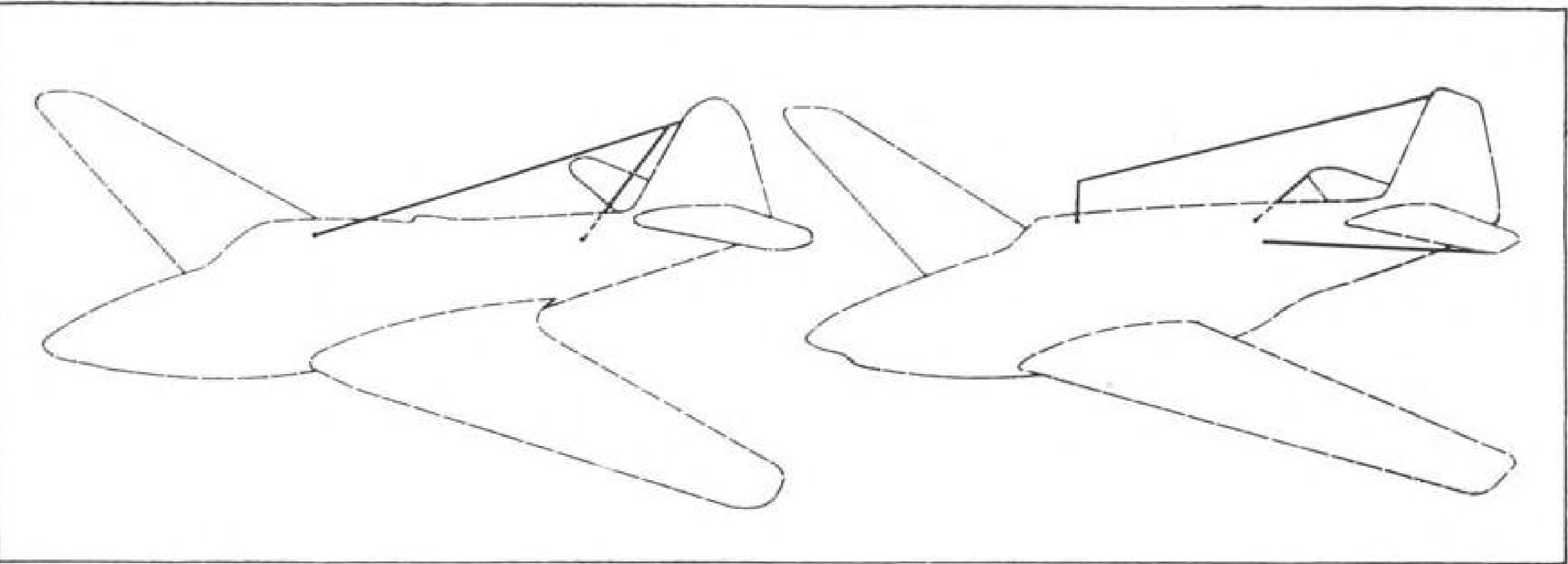
Part VIII



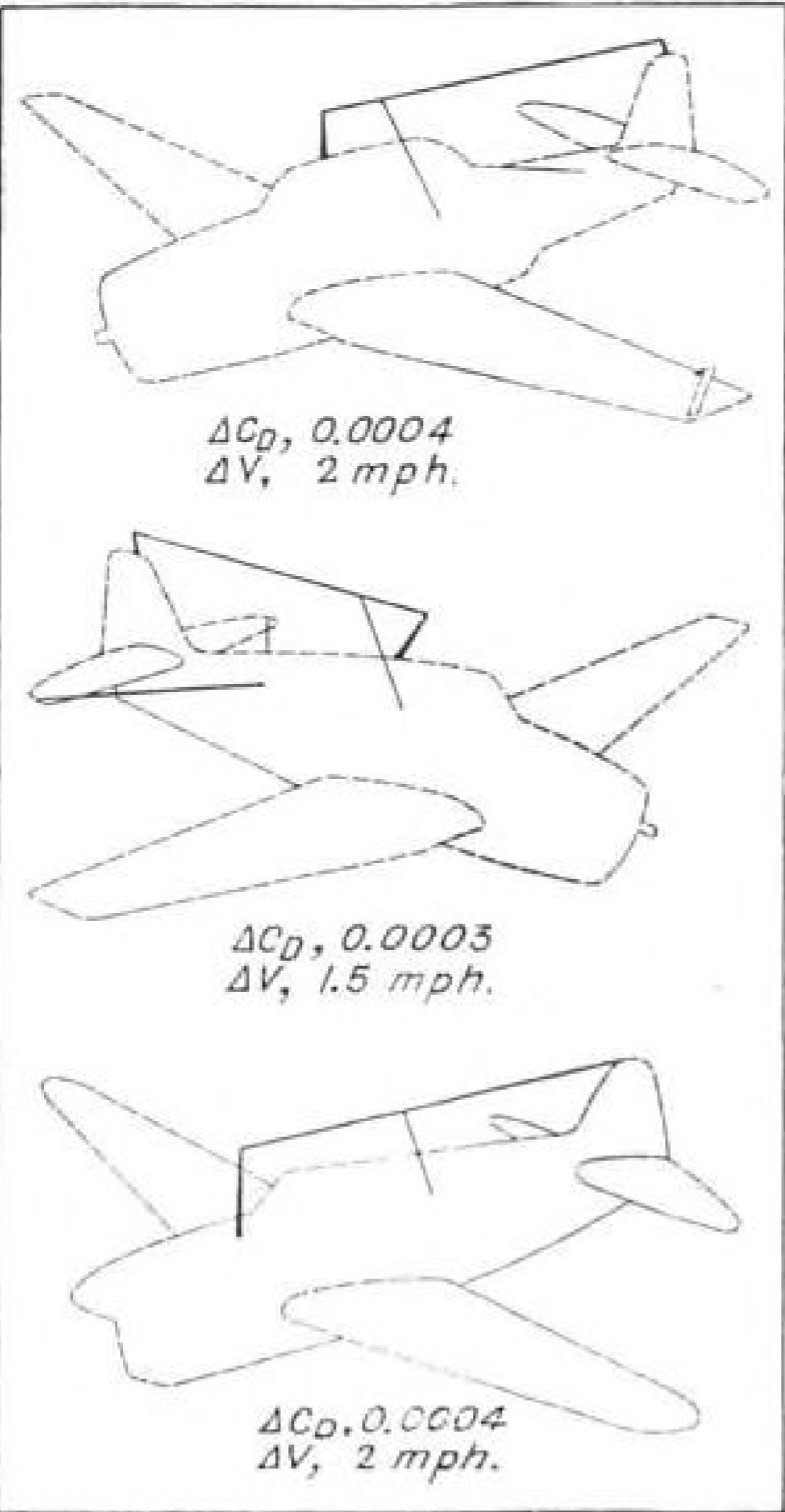
To eliminate sharp peak of original canopy, well-rounded configuration was installed. Although modified canopy was larger, so as to afford greater visibility, unit's drag coefficient was decreased by 0.0004.



Canopy modification for this craft, which included 3-ft. extension of afterbody, was intended to reduce high negative pressures over peak and prevent flow separation at rear of installation. Critical speed of canopy was increased by 44 mph.



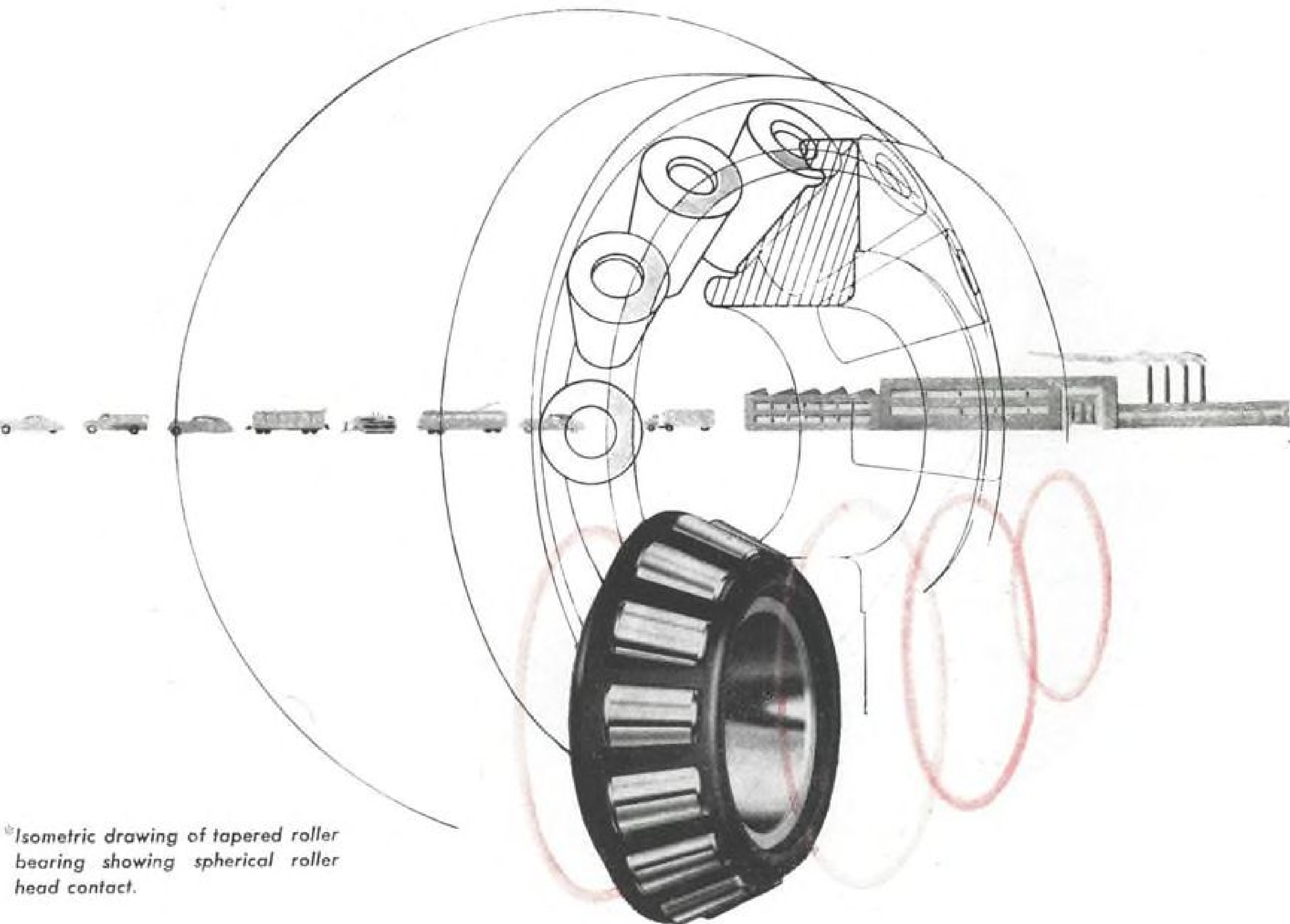
No increase in drag was measured when these radio antennas were installed on craft seen here



Drag-coefficient increments were measured as difference between drag with radio antennas installed and removed. Drag resulting from each of these installations is excessive and caused mainly by thick masts. Note that although same increments were found for antennas shown at top and bottom, former has two masts (fore and aft), while latter has but one (taller) mast.

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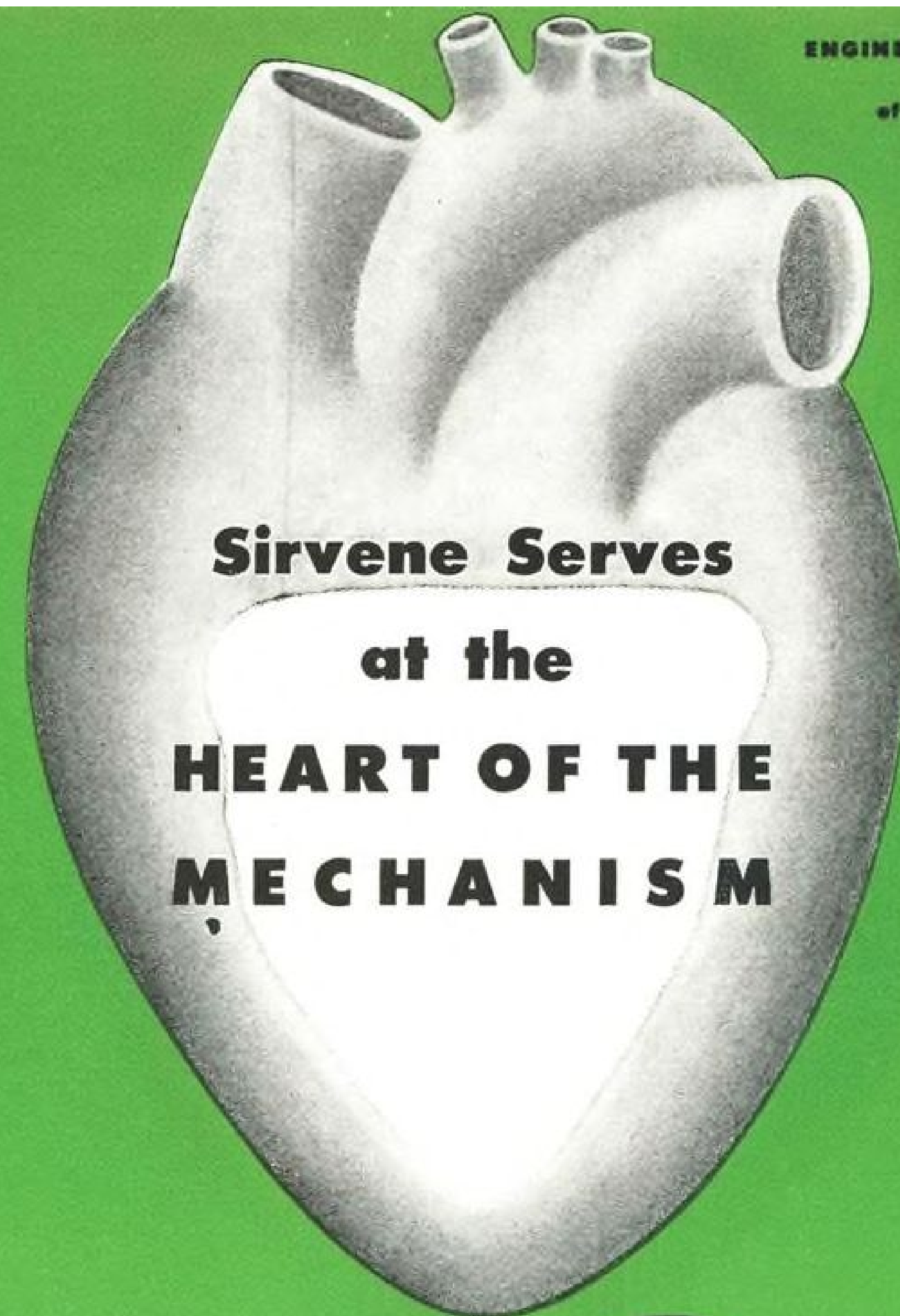
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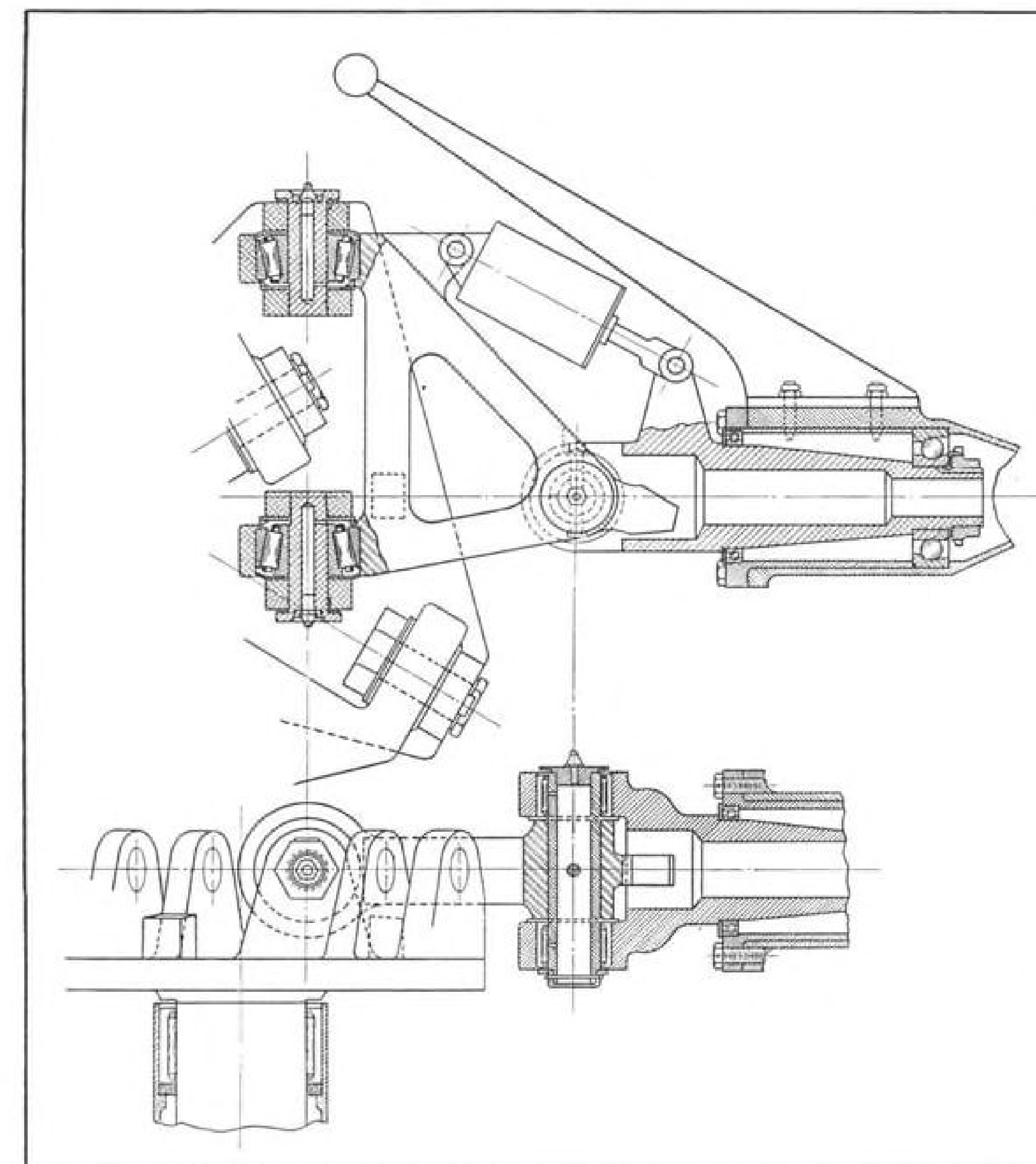


Fig. 1. Example of hub and blade connection.

Practical Engineering Of Rotary Wing Aircraft*

This evaluation of blade attachment factors analyzes drag and flapping bearings.

By HARRIS S. CAMPBELL,
Consultant to Autogiro
Company of America

Drag pivot is often mounted at outboard end of an extension link (as shown in Fig. 1), although in some construction it may intersect the flapping pivot so that the bearings form, in effect, a universal joint for connecting the blade. (General discussion of drag pivot bearings was presented in Aug. 25 issue of AVIATION WEEK.)

► **Drag Bearing Calculations**—For hub shown in Fig. 1, normal operating load at drag pivot is 7,100 lb. centrifugal load. This is evenly carried by two needle bearings located as in Fig. 2.

While minimum allowable life for hub

* This complements material presented in a series of articles under this same title, running from July '46 to June '47, in AVIATION, and in Aug. 25 issue of AVIATION WEEK.

bearings will depend upon particular purpose of the craft, it is customary to provide an average operating life of at least 2,500 hr. Bearings should also be checked to see that they have a reasonable life for autorotational operation at ceiling.

In the present craft, ceiling autorotational rpm. is approximately 260, which produces a centrifugal force of $(260^2/190^2)(7,100) = 13,500$ lb.

In addition, bearings are checked for limit load under flight, and starting and flapping conditions to determine that there is no operational load to produce brinelling.

Limit flight load (assuming possible instantaneous rpm. twice normal) $= (7,100)(4.0) = 28,400$ lb.

Limit flapping moment (see Condition B-1, page 99 Apr. AVIATION) $= 31,200/1.5 = 20,800$ lb.-in.

Limit starting moment (Condition B-1) $= 63,200/1.5 = 42,100$ lb.-in.

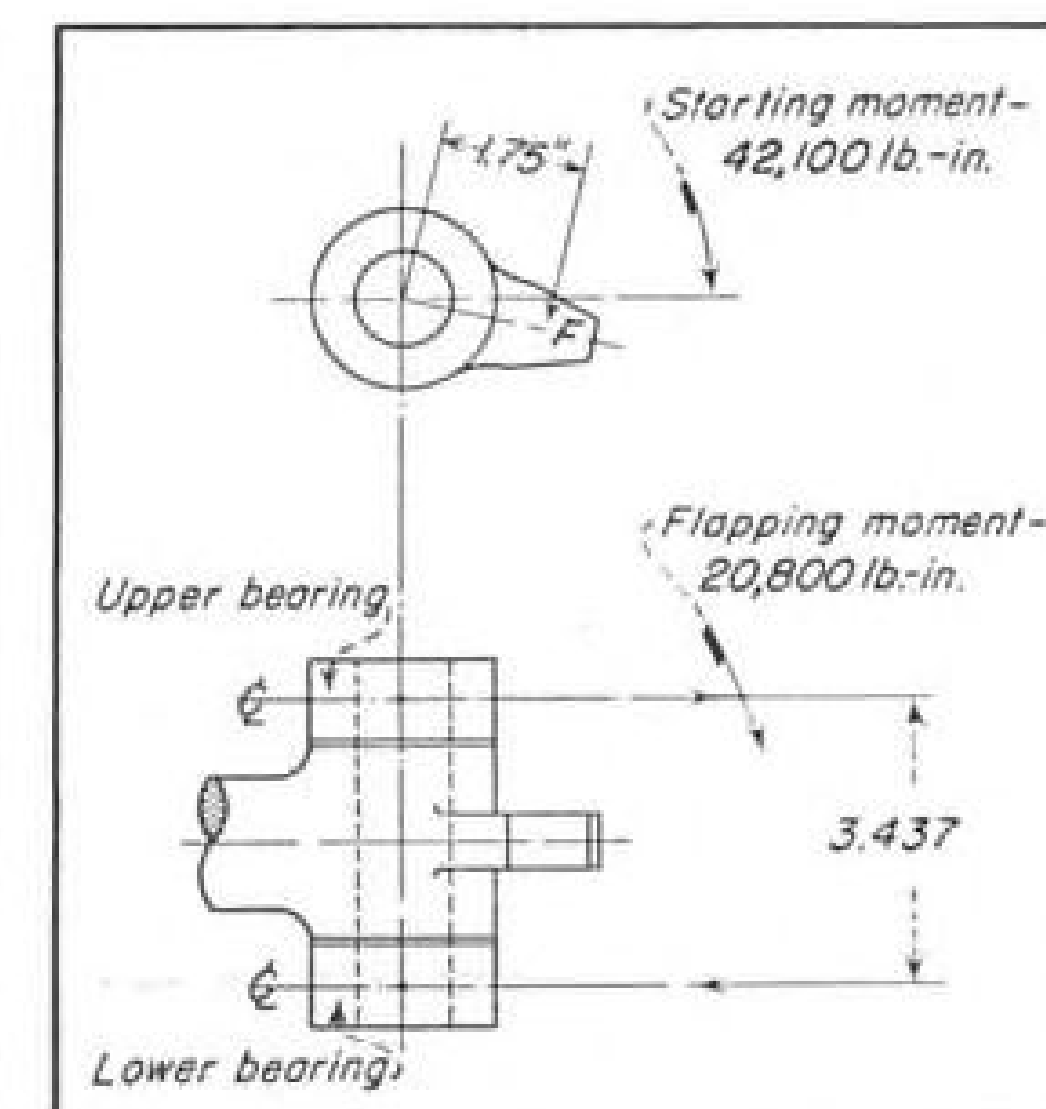


Fig. 2. Loads at drag pivot from starting and flapping moments.

Check loads on upper bearings (see Fig. 2 for dimensions):

Drag load $= 42,100/(2 \times 1.75) = 12,000$ lb.

Flapping load $= 20,800/3.437 = 6,050$ lb.

Assuming both are applied simultaneously resultant radial load on bearings $= \sqrt{12,000^2 + 6,050^2} = 13,450$ lb.

Summary of drag pivot loads are—normal operation, 3,550 lb.; ceiling operation, 6,750 lb.; flight limit, 14,200 lb.; and flapping and starting limit, 13,450.

Needle bearing used is 1.25 in. i.d. and 1 in. long. Effective length of needles is approximately $\frac{3}{4}$ in. Area $= (1.25)(.75) = .937$ sq. in.

Normal operating pressure $= 3,550/.937 = 3,800$ psi.

Ceiling operating pressure $= 6,750/.937 = 7,200$ psi.

Limit load pressure $= 14,200/.937 = 15,150$ psi.

These pressures are satisfactory.

► **Flapping Pivot Bearings**—Flapping pivots, like drag pivots, carry blade centrifugal force while experiencing an oscillating motion. In most autogiro rotors, blades never move more than about 5 deg. from radial position. Thus, so long as flapping pivot is disposed at 90 deg. to blade axis, chief load on flapping bearings is a radial one. Under such conditions, needle bearings, as previously described in connection with the drag pivots, are ideal. Likewise, thrust washers are adequate to carry small end loads developed. Where needle bearings are suitable, the same general basis of design may be used as outlined above for drag bearings.

In certain special helicopter blade attachment arrangements, such as the co-axial pivot combination, and in cases where flapping pivot is outboard of drag pivot, needle bearings are satisfactory. However, most helicopter rotor blades, as well as in autogiro rotor blades having a delta inclination of the flapping pivot are attached in a manner which produces a considerable end thrust on the flapping pivot mounting. This is because in some operating conditions, centri-

fugal force produces an appreciable component along the bearing axis.

In such cases, either an additional bearing is required to carry the thrust load or the usual needle bearing construction should be replaced by a bearing assembly capable of carrying both radial and thrust loads. Ball type bearings should be avoided for carrying radial loads of this nature in which only a small oscillation is involved. Because of their small area of contact, and since only about $\frac{1}{4}$ of the balls carry the load, ball bearings quickly develop a friction oxidation or false brinelling condition under this type of operation unless relatively bulky and heavy bearings are used. Ball thrust bearings have been used satisfactorily in combination with needle bearings carrying the radial loads. Tapered roller bearings are well suited for a flapping pivot mounting where it is necessary to carry combined radial and thrust loads (Fig. 1).

In locating the position of flapping bearings, the different operating conditions should be carefully considered to give most advantageous loading. In helicopters, the blade may change position as much as, and perhaps more than, 20 deg. between autorotational position and full power lagging position. When drag pivot is located a considerable distance outboard of flapping pivot, there may be a large moment applied which changes the load distribution to the bearings as compared to the radial blade position. This will cause an increase in the load applied to one of the bearings when the blade shifts from one lagging position to the other extreme. Where possible, in a helicopter rotor, bearings should be placed to favor power loading condition, because under this condition greatest number of hours of operation will occur.

► **Selection of Flapping Bearings** — For normal operation condition (A-1), blade will be lagging 24°-20' with normal centrifugal force and lift applied.

Using geometry of Fig. 11 (page 57 June Aviation), components at P will be:

$$\begin{aligned} H &= (7,100) \cos 24^\circ-20' = 6,450 \text{ lb.} \\ D &= (7,100) \sin 24^\circ-20' = 2,910 \text{ lb.} \\ F &= 2,100/3 = 700 \text{ lb.} \end{aligned}$$

At A—

$$\begin{aligned} H_A &= (2.55/6.625)(6,450) = 2,475 \text{ lb.} \\ F_A &= (2.55/6.625)(700) = 269 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{2,475^2 + 269^2} \\ &= 2,490 \text{ lb.} \end{aligned}$$

$$D_A = 2,910 \text{ lb.}$$

At B—

$$\begin{aligned} H_B &= (4.075/6.625)(6,450) = 2,975 \text{ lb.} \\ F_B &= (4.075/6.625)(700) = 431 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{2,975^2 + 431^2} \\ &= 3,090 \text{ lb.} \end{aligned}$$

$$D_B = 0$$

For autorotation condition (A-3), there will be zero lag with normal centrifugal force and lift.

Using dimensions of referenced Fig. 11 for the radial position, the components at R will be:

$$\begin{aligned} H &= 7,100 \text{ lb.} \\ D &= 0 \\ F &= 700 \text{ lb.} \end{aligned}$$

SUMMARY OF LOADS AT FLAPPING BEARINGS (LB.)

Bearing	Power Operation	Autorotation Operation	Ceiling Operation	Limit Load
A	2,490 radial 2,910 thrust	5,800 radial	11,000 radial	24,250 radial
B	4,000 radial	1,346 radial	2,560 radial	13,100 radial

At A—

$$\begin{aligned} H_A &= (5.375/6.625)(7,100) = 5,770 \text{ lb.} \\ F_A &= (5.375/6.625)(700) = 568 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{5,770^2 + 568^2} \\ &= 5,800 \text{ lb.} \end{aligned}$$

At B—

$$\begin{aligned} H_B &= (1.25/6.625)(7,100) = 1,340 \text{ lb.} \\ F_B &= (1.25/6.625)(700) = 132 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{1,340^2 + 132^2} \\ &= 1,346 \text{ lb.} \end{aligned}$$

For autorotation at ceiling (approximately 260 rpm.), centrifugal loads will be $260^2/190^2 = 1.9$ times normal sea-level autorotational loads.

At A—

$$\begin{aligned} H_A &= (1.9)(5,770) = 10,950 \text{ lb.} \\ F_A &= (1.9)(568) = 1,080 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{10,950^2 + 1,080^2} \\ &= 11,000 \text{ lb.} \end{aligned}$$

At B—

$$\begin{aligned} H_B &= (1.9)(1,340) = 2,550 \text{ lb.} \\ F_B &= (1.9)(132) = 251 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{2,550^2 + 251^2} \\ &= 2,560 \text{ lb.} \end{aligned}$$

Bearings should be selected to give desired life for operational condition. Normally, average life for power operation would be expected to be at least 2,500 hr. For sea-level autorotation, a somewhat shorter life than for power operation would be permissible. For ceiling autorotational operation, life should be at least 50 to 100 hr.

Also, maximum limit load on bearings must be less than brinell capacity. Limit loads on bearings for the various conditions may be obtained by taking two-thirds of the ultimate values shown in the accompanying tabulation. By inspection, it will be evident that Condition A-3 will give maximum limit load for bearing A, and Condition A-2 will give maximum for bearing B.

Maximum limit load on bearings:

$$\begin{aligned} \text{Bearing A—} \\ H_A &= (36,180)(.667) = 24,150 \text{ lb.} \\ F_A &= (3,410)(.667) = 2,275 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{24,150^2 + 2,275^2} \\ &= 24,250 \text{ lb.} \end{aligned}$$

$$\begin{aligned} \text{Bearing B—} \\ H_B &= (19,480)(.667) = 13,000 \text{ lb.} \\ F_B &= (1,940)(.667) = 1,295 \text{ lb.} \\ \text{Resultant radial} &= \sqrt{13,000^2 + 1,295^2} \\ &= 13,000 \text{ lb.} \end{aligned}$$

Flapping bearings are selected on the basis of normal operating loads. If loads on the two bearings are somewhat near equal, it is desirable, from a manufacturing and service standpoint, to select same size bearing for both positions. Maximum radial load during normal power operation is on bearing B. Select a bearing from manufacturer's catalog for this load and check to see if it is satisfactory for loads at bearing A, which carries both radial and thrust loads.

For tapered roller bearing having cone

No. 3659 and cup No. 3620, radial rating at 500 rpm. is 2,025 lb., and thrust rating is 1,120 lb. as given in Timken bearing catalog. These ratings are based upon a life of 3,000 hr. operation with not over 10% bearing failures or an average bearing life of 12,000 hr. If an average life of approximately 2,500 to 3,000 hr. only is required, life factor f is given in manufacturer's catalog as .67. For an oscillating condition such as applied at flapping pivot, limited field experience indicates a possible allowable loading up to $2\frac{1}{2}$ times the 500-rpm. rating. This $2\frac{1}{2}$ factor for oscillating loads has not been definitely established by extensive testing. It is believed satisfactory for design use until such time as more extensive data are developed.

For flapping pivot then, this bearing has a probable allowable radial load rating = $(2,025)(2.5)/.67 = 7,580$ lb. This bearing more than satisfies the requirements for unit B.

Bearing at A carries both radial and thrust loads. From manufacturer's catalog, equivalent radial load for this condition = .66 (radial load) + k (thrust load), where k = radial rating / thrust rating = $2,025/1,120 = 1.81$.

Equivalent radial load on bearing A: $(.66)(2,490) + (1.81)(2,910) = 1,640 + 5,270 = 6,910$ lb.

Bearing selected for location B with permissible operating load of 7,580 lb. shows satisfactory margin for location A for normal operation.

From the tabulation, normal autorotational loads are less severe than normal power operation loads because there is no drag load applied to bearing A during autorotation.

At ceiling operation, load of 11,000 lb. is applied to bearing A. Life factor based on 7,580-lb. rating will be:

$$f = 7,580/11,000 = .69.$$

From Timken catalog life expectancy table, it will be found that average bearing of 800 hr. for this 11,000 lb. load may be expected—more than adequate.

Maximum limit load on bearing A is 24,250 lb. (radial). A non-brinell rating on this bearing of 15 times the catalog 500 rpm. rating may be used. For cone 3659 and cup 3620, this will give a non-brinell capacity of $(2,025)(15) = 30,400$ lb.

Brinell M.S. = $30,400/24,350 = 1 = .25$.

Note: Brinell value of the tapered roller bearings is not given in manufacturer's catalog. Non-Brinell rating of 15 times the 500 rpm. rating given above may vary somewhat with different bearings. Hence, non-brinell capacity should be checked with bearing manufacturer.

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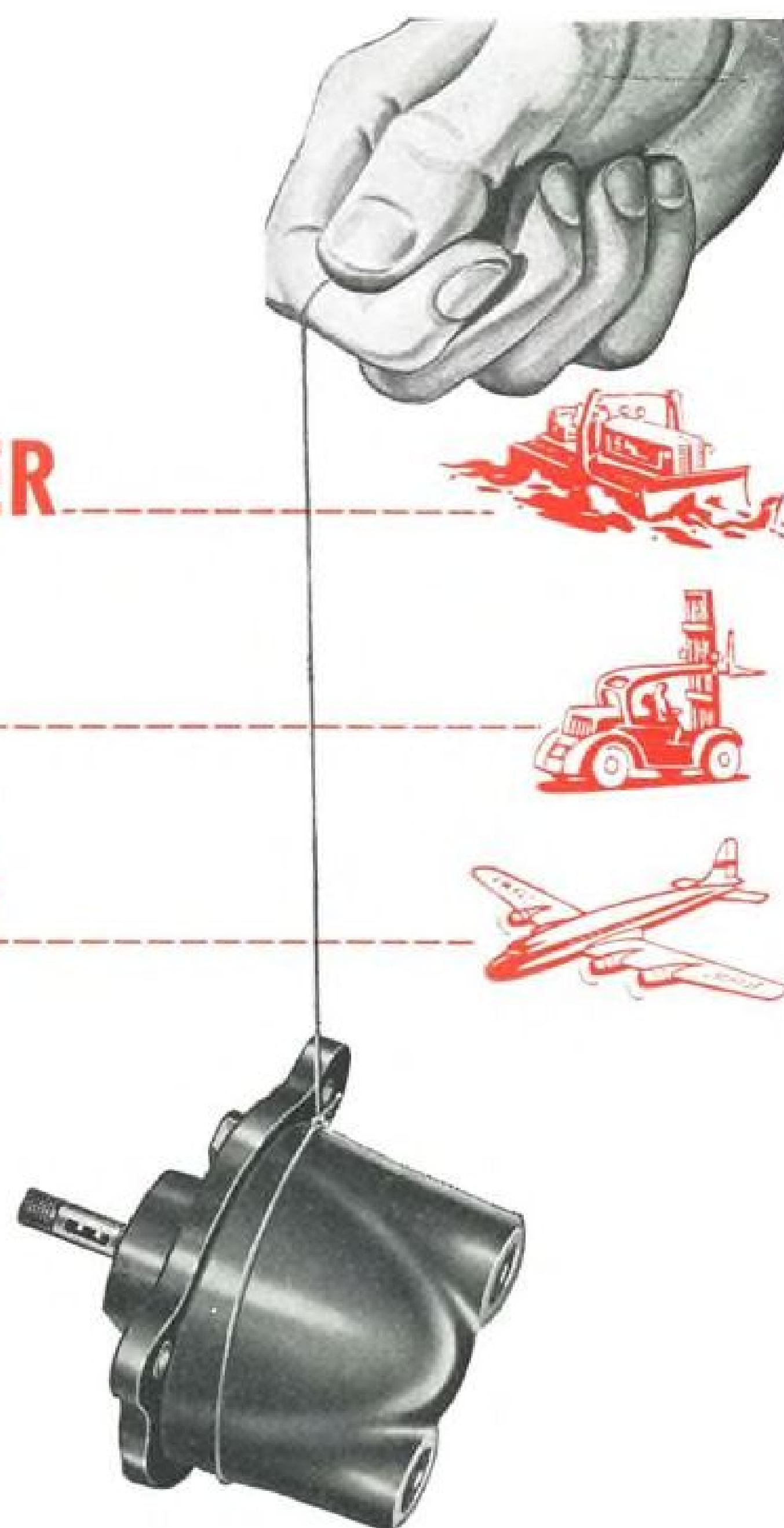


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NEW AIRCRAFT



Three-quarter view of Miles Gemini flying on one engine (non-featherable prop). Craft has large unobstructed windshield and side windows. Gear retracts into engine nacelles, with wheel bottoms exposed. Photo clearly shows dihedral of wings and clean lines.

Flight Report

Gemini Invades U. S. Small Plane Market

British twin-engine four-placer shows good performance on AVIATION WEEK test flight. Nation wide demonstration trip underway. Will visit Canada on way west.

By ALBERT E. SMYSER, JR.

Spurred by an encouraging response from American pilots, the Miles Gemini is continuing its tour of the United States and Canada in an attempt to invade these aircraft markets. The tour will include Boston, Chicago, then swing up into Canada, across that country westward to the Pacific Coast, re-enter the States and return to the Atlantic Coast via the southern route.

During its stop at LaGuardia Field, N. Y., the Gemini was flown by an AVIATION WEEK representative.

Externally, the Gemini is similar to American planes of comparable size except the fuselage is all wood, in-line engines are used, special wing slots are installed, and it has an unusually short and wide landing gear.

► **Cabin**—Interior arrangement is of greater interest. Conventional controls are installed but the stick is carved so that there is greater knee-room available; brake lever is mounted on the throttle block (differential of the brakes

being controlled by position of the rudder pedals); tachometers are mounted in the individual engine nacelles in a position which makes them readily readable from either side of the cockpit. This arrangement is justified by the lower maintenance requirements of such a system.

Mixture controls are mounted in center of instrument panel. Turn and bank indicator is of British design having two needles rather than conventional needle and ball; other instruments follow usual designs.

Cockpit nomenclature may tend to be a bit confusing to American pilots, for example landing gear retracting switch is labeled "Chassis," and fuel gages marked "petrol" however, the temperature gages are calibrated in Fahrenheit, and oil pressure in lb./sq. in.

► **Performance**—In flight the performance of the Gemini is excellent. Takeoff was accomplished, despite a strong crosswind, in well under 400 ft., with near capacity load; climb at 2,250 rpm.

was approximately much 750 ft./min.

Radio reception on the built-in speaker left much to be desired during the period of climb due to excessive engine noise. Under cruise conditions, however, reception of range signals was good and earphones were unnecessary except for voice announcements.

Gear retracted quickly and quietly (after we deciphered the label). Aileron controls were found to be much more sensitive than those of its American competitors; trim tabs are sensitive but allow close adjustment, enabling the pilot to trim the plane to fly "hands off" in level flight. Stall is gentle and the aircraft shows no tendency to fall off on one wing during such maneuvers.

We also tried slow flight using 10 deg. flap and an airspeed of about 35 mph. Control was good and there was little or no feel of mushing. Single engine flight with flaps extended was a perfectly straight forward operation and the plane reacted well to all controls insuring safe single engine landings.

► **One-Engine Performance**—Single en-



Hatch has left and right liftable sections for quick, easy access from either side of plane. Front right seat has hinged back to facilitate loading. Cockpit (right) affords ample room and the instrument panel features "package" radio equipped with loudspeaker.

gine flight was of particular interest since it was found that the plane would fly on one engine with very little additional power needed on a "good" engine. Level flight condition required merely a slight bank toward the "live" engine, no rudder trim was needed and the airspeed was held to about 105 mph.

Approach and landing is normal, with the company pilot at the controls the glide was steeper than necessary, requiring a rather abrupt flair out prior to touch down. Reason for this was to demonstrate the short space required to land and stop. Full stall (three point) using full flap, occurred at about 28 mph. Soft gear action makes taxiing pleasant.

► **Good Visibility**—Visibility from the cabin is good, the wide windshield being unobstructed as far as the entrance hatch. Side windows are large and may be opened by pulling the forward section aft. Cockpit ventilators are installed on either side of the instrument panel and are adjustable as to flow and direction of fresh air brought in, units being designed to prevent admission of water in the event flight is made through precipitation.

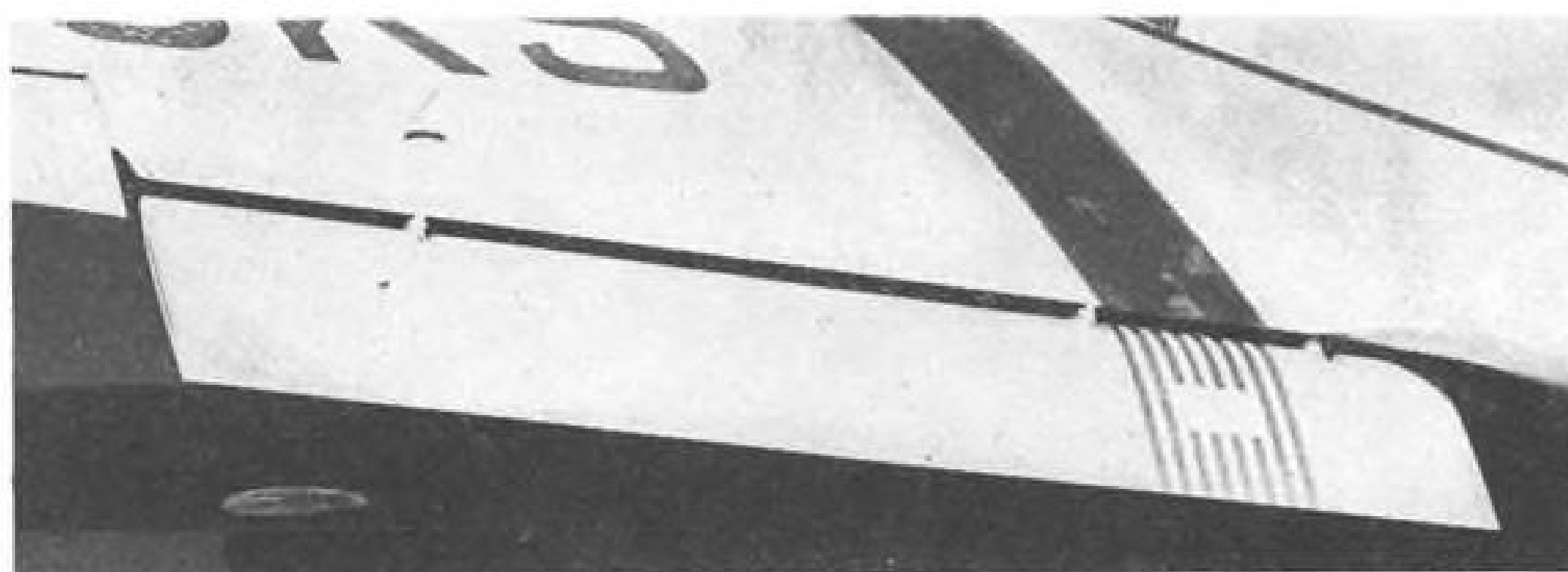
Controls are conveniently placed so they are readily accessible to the pilot

without stretching. Trim tab position indicator is located on lower left part of panel and is graduated in degrees of nose and tail heaviness (neutral position is zero). Undercarriage retracting switch and safety lock are located in lower center of panel; fuel gage and switches are on lower left near tab indicator.

► **U. S. Price**—Proposed price to U. S. purchasers will be between \$16,000 and \$18,000 delivered in States. Optional powerplants are being offered. With the present engines (100 hp. Cirrus) the cruising speed is said to be about 131 mph, though during period I flew it cruising speed seemed nearer 120 with alternate power (Continental) cruising speed is expected to be about 150 mph. (engine to be equipped with Aeromatic propellers). With Continental engines fuselage will be extended to balance the weight of engine which will project forward more than the present Cirrus engines.

Wing slats are special Miles designed "broad chord" type which gave wing the excellent stall tendencies noted above.

Specifications of the Gemini: Span 36' 2"; length 22' 3"; height 7' 6"; wing area 191 sq. ft.; gross weight 3,000 lb.



Close-up of auxiliary airfoil flap. Unit is typical of flaps used on all late Miles aircraft.

Manufacturing Sales Shifts Announced

New sales executives have been named by two aircraft equipment companies and by an overhaul and maintenance organization, Lockheed Aircraft Service, Inc.

Tinnerman Products, Inc., has appointed R. R. Russell general sales manager. Since 1941 he had been vice president and general sales manager of Commercial Controls Corp. and has spent more than 35 years in sales management work.

H. A. Hansen has been named sales manager of Skinner Purifiers division of Bendix Aviation Corp., which recently acquired control of the Filter Manufacturing Company. He has been in charge of sales for the Marine Carburetor and Filter departments of the Zenith division of Bendix.

Lockheed Service's appointments are George C. Stewart, formerly manager of the field service department, as manager of military sales, and Thomas T. Hinman, formerly assistant to the vice president of PCA, as sales representative in New York.

In other personnel actions:

• **Carborundum Co.** appointed Dr. Gordon M. Butler senior engineer of the research division. He has been with Allegheny Ludlum Steel Corp.

• **Stinson division**, Consolidated Vultee Aircraft Corp., appointed John H. Lancaster public relations director. He formerly was New York Editor of Flying Magazine.

• **Brown Instrument division** of Minneapolis-Honeywell Regulator Co. transferred Edward B. Kohl from the Houston to the Corpus Christi branch, and I. K. Farley from Philadelphia to Houston. John D. Root, formerly instructor at Brown School of Instrumentation, has been made sales engineer at Philadelphia. E. Curt Richards has been transferred from general sales department to the New York sales engineering staff. Thomas Pitts has been appointed industrial sales engineer at Charlotte.

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Split retaining ring of stainless steel which secures washer firmly to outer ring of bearing. Easily removed with penknife for inspection, washing and re-greasing ... and just as easily replaced. Causes no distortion of outer ring or race.

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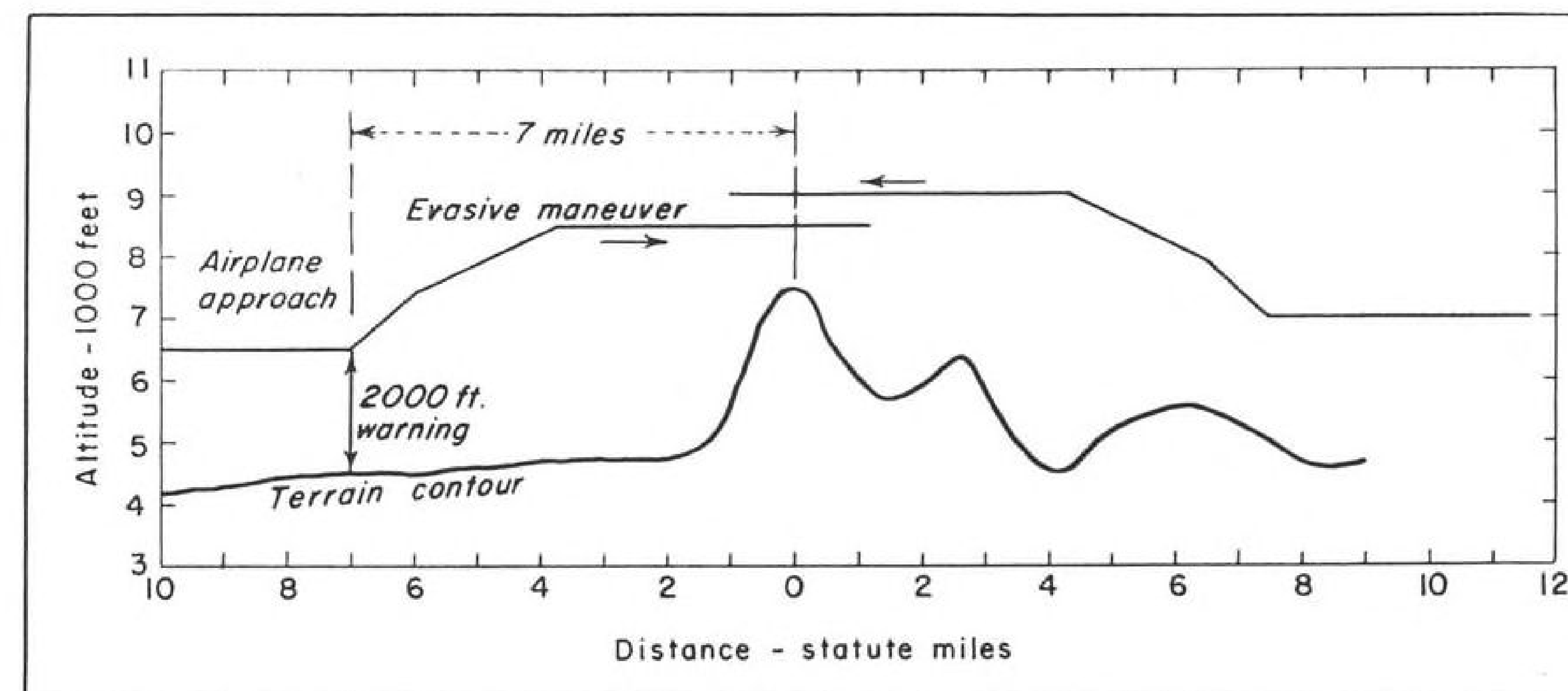


Fig. 1. This typical profile shows how 2,000-ft. altitude clearance indication affords sufficiently advanced warning for pilot to climb to safe height. Though 7-mi. peak-warning is shown for this profile, "weighted average" is $7\frac{1}{2}$ mi.

How Hughes Radar System Promotes Anticollision Flying

Here is cogent evaluation of simple, evasive maneuvers.
... Procedure affords " $7\frac{1}{2}$ -mi. warning."

At least 96 percent of the accidents in which planes fly into mountains—because of defective course or altitude data—are estimated as preventable with use of the new Hughes system of anticollision flying. When this 15-lb. radar installation flashes a warning light indicating that there is an obstacle within 2,000 ft. below the plane, the pilot puts the craft into a straight climb at the rate of 900 ft. for the first mile, then

continues climbing at 500 ft. per mi. thereafter until he has climbed 2,000 ft. or sufficiently higher, so that the warning signal disappears.

Statistical studies of terrain contours in the vicinity of principal airways over mountainous territory and examination of the CAA and CAB terrain collision reports from 1933 to 1946 have been employed as the basis for choosing this particular type of air radar equip-

ment and for establishing the evasive climbing routine.

► **Operational Factors**—Data on the nine accidents in 1946, in which planes collided with the terrain indicate that even if a 500-ft. clearance warning had been available, six of these accidents could probably have been averted. Airplane collisions with mountains have always constituted one of the spectacular hazards of airline operation. With but few exceptions, only a few hundred feet of additional clearance would have prevented collision.

To determine how a pilot could be warned of the need for the additional altitude, extensive profiles were made of the terrain beneath straightline tracks passing over mountainous territory along and adjacent to principal established air routes. Fig. 1 depicts a typical profile of this character.

From these various profiles it was found that if planes approaching in either direction were given warning of terrain clearance of only 2,000 ft., pilots would be warned, on a "weighted average," about 7.5 mi. from the peak; in extreme cases, only within about 3 mi. of it; and in some instances as far away as 30 mi. Thus, the 2,000-ft. ground clearance warning is, in effect, a $7\frac{1}{2}$ -mi. obstacle indication. The accompanying tabulation gives the figures from which this $7\frac{1}{2}$ -mi. range is developed.

To keep the apparatus simple and to minimize possibility of ambiguous interpretation, the equipment that is used to give this terrain clearance warning is a simple radar, the indication from which is an amber light if the plane approaches within 2,000 ft., or, by switch selection, a red light if within 500 ft. Aural or other means of alarm signaling can be

Average Distance (Mi.) From First Warning to Peak
Altitude of Approach (feet below peak)

Location	0 to 500	500 to 1,000	1,000 to 1,500	1,500 to 2,000	2,000 to 2,500	2,500 to 3,000	3,000 to 3,500	3,500 to 4,000	4,000 to 4,500	4,500 to 5,000
	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000
San Jacinto Mt.	4.0	4.4	5.0	6.0	5.8	6.7	6.9	7.2	7.0	7.6
Mt. Laguna	5.2	6.2	6.8	6.9	7.1	4.2	4.5	4.9	....	....
Manzano Range	3.2	4.1	3.1	5.0	3.7	5.2	....	....	....	....
Elk Mt.	6.3	4.5	7.4	9.4	11.5	....	....	....	....	....
Wasatch Mt.	3.1	3.4	3.7	4.4	4.5	4.5	5.8	4.7	5.3	7.2
Great Smoky North	2.5	7.6	13.8	15.7	26.4	32.1	26.4	....	....	....
Great Smoky South	11.0	20.8	24.9	....	....	....	....	....	....	....
Average	5.0	7.3	9.2	7.9	12.3	10.5	10.9	5.6	6.2	7.4

$$\text{Weighted Average} = (5.0 \times 5 + 7.3 \times 4 + 9.2 \times 3 + 7.9 \times 2 + 12.3 + 10.5 + 10.9 + 5.6 + 6.2 + 7.4) / 20$$

$$= 7.5 \text{ mi.}$$

readily attached. The shorter range is sufficient for warning in the less rugged terrain of the east and for procedure of letting down with instrument landing.

Use of a 2,000-ft. clearance warning is partly determined by the anticipated degree of climb that can be readily realized to rise above the obstacle, so that pilot can be warned in time to gain safe altitude. In the case of the Douglas DC-3, the evasive procedure climb can be made under sustained power condition. Newer planes which exceed the required rate of climb would provide greater margins of safety.

► **Estimating Protection**—To determine the relative number of mountainside collisions that such a system would prevent, the altitudes at which planes struck were tabulated. These figures indicated that most planes struck near the peaks—all accidents during the past 14 years occurring within 500 ft. of summits. If the plane is flying sufficiently low to hit the mountain, it is more likely that it will hit the peak rather than strike near the base, since pilot intends to clear it.

However, planes might attack at any altitude, as illustrated in Fig. 2. Hence, a weighting factor was assigned to each altitude of attack. Of all the planes approaching at altitudes low enough to produce collision, 5 were assumed to approach within 500 ft. of the summit, 4 within the second 500-ft. level, 3 within next 500 ft., then 2 within the succeeding 500 ft., with all lower levels being assigned a weighting factor of 1 plane each. Actually, this weighting is conservative, as indicated by the altitudes at which accidents have occurred. Since, from statistics, the probability is 100 to 1 that the plane will attack within 500 ft. of the summit altitude, the actual weighting places an excess number of craft at low levels. On the other hand, such weighting does provide a reasonable estimate of safety afforded by the anti-collision system, so that the technique can be evaluated.

Using these weighting factors to provide a statistical estimate of the altitudes at which planes would be approaching mountains, it was found that a terrain clearance warning at 1,000 ft. would avert 82 percent of potential accidents, and a warning at 2,000 ft. would avert 96 percent. (It is considered impossible to avert all accidents.) Of 1,166 tabulated hypothetical collisions that would have occurred under present flight procedures, it is estimated that only 43 would occur with this anticollision system of flying. The 2,000-ft. (or effectively 7½-mi.) warning is considered to be most usable.

Commercial planes which fly under instrument conditions over mountainous regions in the west are cleared for such altitudes that they should rarely come within 2,000 ft. of the ground.

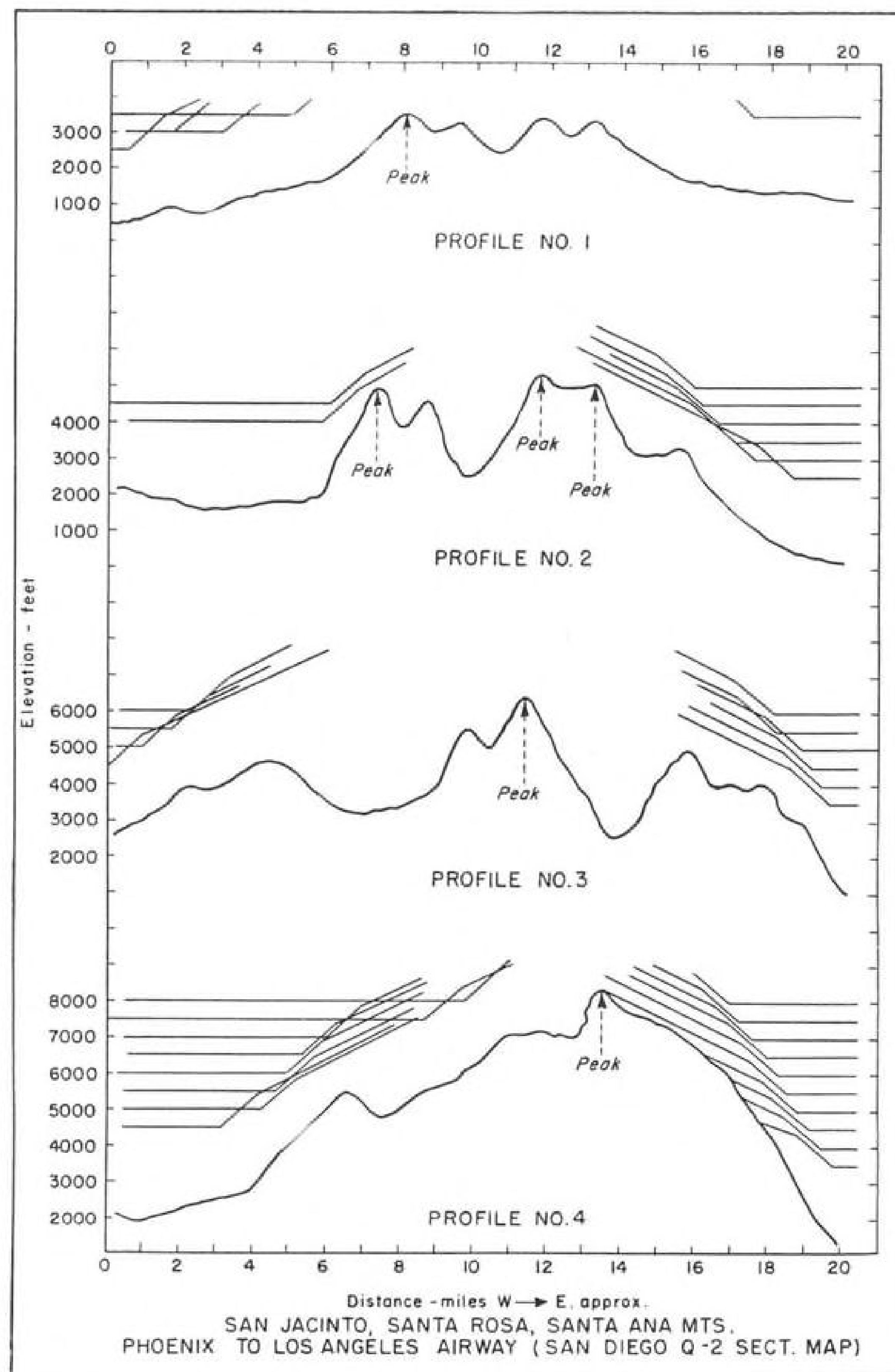


Fig. 2. Attack and evasive maneuvers plotted on various profiles to indicate that 2,000-ft. warning enables most planes to clear peaks. Collisions are shown in Profile 4.

► **Equipment Details**—The terrain clearance radar used in the anticollision system occupies a box 9 x 8 x 15 in., and is powered directly from the 28v. aircraft battery. (A unit for 12v. operation is presently being developed.)

Checker switch can be thrown to feed a small portion of the transmitter signal to the receiver and thus check the operation of all electronic circuits of the equipment. The single unipole antenna is mounted vertically under the craft's belly so that it covers the hemisphere below the plane. Thus, any obstacle—terrain or plane—within a 2,000- (or

500-) ft. radius from the underside of the plane will produce a warning indication. Pilot, knowing that he is potentially in trouble, then makes his procedure climb. In the event that the warning is produced by another plane, he will climb over it. Because the radar is insensitive to obstacles above the plane, the evasive maneuver will be safe (if a craft above is similarly equipped), there is no ambiguity as to the direction of the obstacle, thus no occasion for indecision on pilot's part. This simplicity is an important feature of any warning device.

NEW ROCKET ENGINE FOR SUPERSONIC PLANE



built with a "heart" of Stainless Steel Tubes

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The combustion chambers and the manifold tubes, which the manufacturer* describes as the heart of the engine, are made from Seamless Stainless Steel Tubes.

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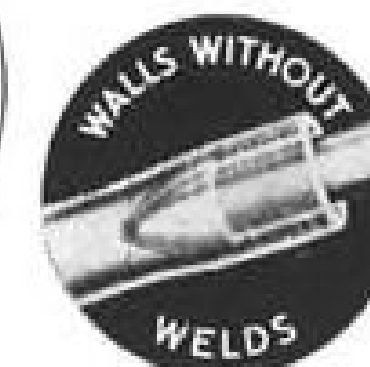
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So whether you build, or operate any type of aircraft and you have a need for a dependable source of heat for passenger comfort . . . anti-icing . . . for warming controls . . . windshield and instrument de-fogging . . . in flight or on the ground, you can find the answers to your problems by calling on Surface Combustion.

For new aircraft or for planes you are now flying, there is a size and type of Janitrol Combustion Heater that can readily be adapted to your needs. Most leading airlines standardize on Janitrol to lower their operating costs and to simplify maintenance through the interchangeability of the units, service parts, fuel control assemblies and ignition systems.

Write today to get up-to-the-minute information on the latest developments in aircraft heating.

SURFACE COMBUSTION CORPORATION

Aircraft-Automotive Division,
TOLEDO 1, OHIO

BRIEFING PRODUCTION NEWS

Bendix Aviation Corp. has purchased Skinner Purifiers, Inc., of Detroit, manufacturers of filtration equipment for automotive, aviation and industrial uses. Skinner will be the fourteenth division to be brought within the Bendix organization. Its annual business is approximately \$1,000,000.

Goodyear Aircraft Corp. has granted 1,800 production workers six paid holidays a year as an aftermath of the 42-day strike last spring. The UAW local asked for the holidays at that time, as well as a wage increase which was not granted.

Sperry Gyroscope Co. has established a department, under direction of William Kuehnle, to take on subcontracting work. Company states it has more than 1,000,000 annual man-hours available. An order from Western Electric already has been received.

Standard Manufacturing Co., Dallas, has received an AAF research contract for development of new bomb-loading equipment capable of handling a 4,000 lb. bomb with an overload of 300 percent, or a 12,000 lb. load, in temperature as low as 60 degree below zero.

Glenn L. Martin Co. has 12 2-0-2s on final assembly. Three have been delivered to Northwest Airlines. First two planes for Chilean National Airlines are completing tests, and NWA's fourth, fifth and sixth airplanes are in the same status. Company has delivered nine AM-1 Mauler single-engine bombers to the Navy and two more have been accepted.

Simmonds Aerocessories, Inc. has moved administrative, sales and engineering offices from Long Island City to 105 White Plains Road, Tarrytown, N. Y., telephone, Tarrytown 4-3140.

Cornell Aeronautical Laboratory, Buffalo, has granted a 10-cent hourly wage increase to 150 workers, bringing top rate at the plant to \$1.85 an hour.

Consolidated Vultee Aircraft Corp.'s San Diego division has been awarded the National Safety Council's distinguished service to safety award. Plant had an injury-free period of 97 days and 3,472,718 man-hours.

Lapeer Manufacturing Co., Lapeer, Mich., has acquired Knu-Vise, Inc., Detroit, and will market that company's toggle-action clamping devices under the Knu-Vise name. Sales offices will remain at 2208 Eighth Street, Detroit.

Air Associates, Inc. has been appointed an agent by the War Assets Administration to act as distributor for aircraft components and supplies warehoused at Kansas City.

Douglas Aircraft Co. has delivered 60

DC-6s to American (31), United (23), Panagra (3), National (2), Sabena (1) and ATC (1) which have logged 7,000,000 flight miles.

Lamson & Sessions is boosting production of bolts 20 percent in its Cleveland plants, raising production 500 tons per month over the summer average.

Lockheed Aircraft Corp. has delivered the first three of an Irish airline order for five Constellations.

Ryan Aeronautical Co. has withdrawn

from manufacture of metal caskets and has sold rights and tooling to Boyertown Burial Casket Co., of Pennsylvania.

Pesco Products division of Borg-Warner Corp. is constructing a \$120,000 laboratory near Cleveland for testing of aircraft fuel systems.

Eutectic Welding Alloys Corp. has opened a new plant in New York City capable of producing annually \$10,000,000 worth of 90 special types of welding rods.

Sperry Gyroscope Co. has sold 69 automatic flight systems (A-12 gyropilot with C-2 gyrosyn compass and H-3 gyro-horizon accessories) to foreign lines.

AIRCRAFT SUPPLIES

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A NEW DIVISION OF AN OLD FIRM

When you call or write C. J. Hendry's Aircraft Division, you will be talking to men who have had up to thirteen years' experience in this specialized field. Long experience plus the facilities of one of the World's largest ship supply companies make this an excellent source of supply for all your aircraft and maintenance requirements.

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NEW AVIATION PRODUCTS



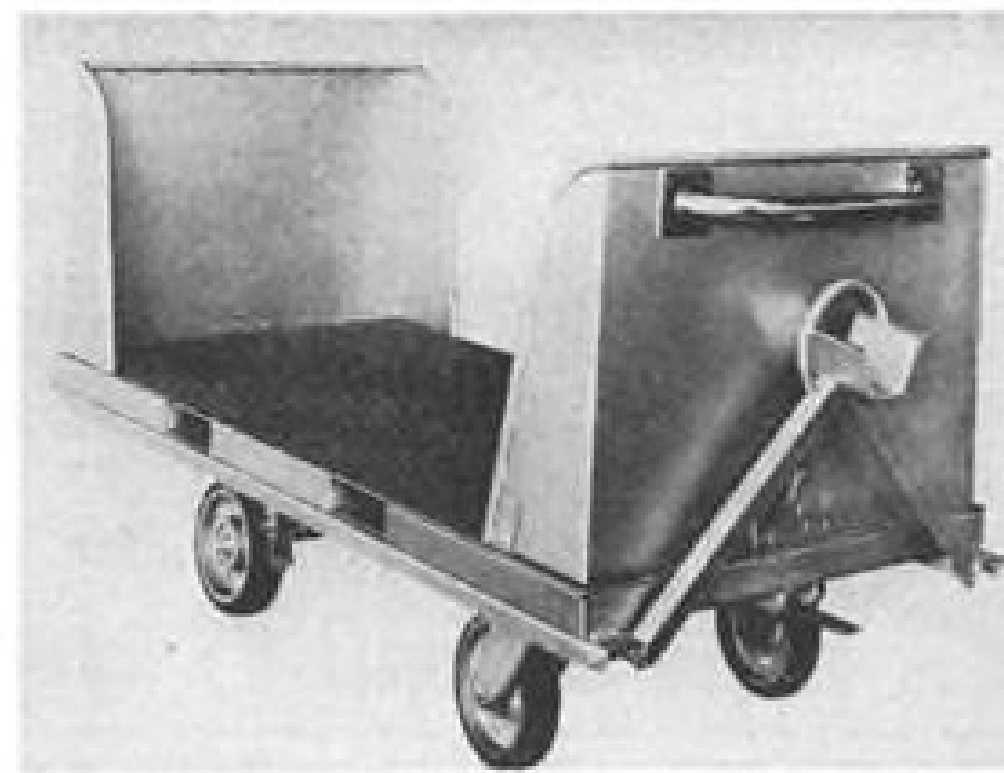
Supplies Air Without Hiss

No-Whistle Ventilator

Hiss and whistle of conventional straight-tube passenger-plane ventilators are reported eliminated in "Gentlaire" unit being installed on Convair-Liners. Maker is Carbee Tool & Manufacturing Co., Los Angeles, which has been given exclusive rights by Consolidated Vultee. Usual ball mounting enables directional control of "individualized" air, and volume of flow may be adjusted by either pushing or pulling tubular portion of unit (top photo). At pressurized entrance in back part of ventilator, conical element (second photo) breaks up audible-octave sound waves, thus doing away with whistle common to former devices.

All-Purpose Baggage-Cargo Cart

All salient features specified by ATA and major airline engineers are reported incorporated in new economy-model combination baggage and cargo cart announced by Airquipment Co., 2820 Ontario St., Burbank, Cal. Steel in structure, carts have aluminum diamond-plate bed top. Capacity is put at 2,000 lb. at normal operating speed. With 10-in. dia. wheels employed, cart has two swivel casters and two rigid casters, all rubber tired and so located that 60-deg. tracking is possible in train operation. There are fork-lift channels



Cart Has All-Purpose Features



Multi-Nozzle Barrage Kills Fires

in truck bed, and hitches are provided to fit all standard types. Parking brake locks cart when not in use. Both upper-structure ends of unit are quickly removable to enable handling of cargo longer than 6 ft. x 3 ft. cart dimensions. Push handle is included for manual operation.

Nine-Nozzle Fire Fighting Truck

War-learned techniques of extinguishing plane-crash fires in shortest possible time are now put into practice by airport fire truck being marketed by Cardox Corp., 307 N. Michigan Ave., Chicago. This truck, which can speed to fire at nearly 60 mph., applies its principal blaze-smothering agent, CO₂, at rate of more than 3,000 lb. a minute, employing a total supply of 2 tons. In addition, 230 gal. of mechanical foam solution are carried to complement the CO₂ action. One feature is truck's new 10-ft. front-mounted nozzle boom which has working elevation of 18 ft. giving effective range of 50 ft. Moreover, oscillating ground-sweep nozzle directs simultaneous wide-arc blast at base of flames, and two fixed foam makers, mounted on bumper, also go into action. Once this heavy frontal attack is in play, two hand-line CO₂ operators work around edges of fire and into those places not directly accessible to mounted nozzles, while two other

men follow up with foam lines. Besides this total barrage of eight nozzles, a ninth nozzle—the bayonet type for piercing plane compartments, engine nacelles, and wing skin—can be used if needed. In standard operation, driver "doubles" at discharge controls, and there is one man at each of four hand lines, making crew of five. In an emergency, fewer men might handle job. AVIATION WEEK illustrations show test demonstrations of fire truck by Grumman company. In top photo, boom, sweep, and bumper batteries are directly enveloping flames, while first line man is seen making approach from left side. With blaze quickly blanketed, other line men (second picture) get in their finishing touches. Man at wing leading edge wields bayonet-type nozzle.

Information Tips

Small-Batch Aero Stampings

Quality stamping of parts from blanks, in small quantities or for experimental purposes, are detailed in illustrated 4-page bulletin, No. 101, issued by Federal Tool & Mfg. Co., 3212 N. Washington Ave., Minneapolis 12. Economies are reported in use of company's service by aircraft firms.

Describes Welding Units

"A Presentation of Welding and Cutting Equipment" is unusually graphic 20-page catalog released by Victor Equipment Co., 844 Folsom St., San Francisco. Numerous units and accessories are pictured in four colors and are fully detailed in accompanying descriptions.

Manufacturing Phases in Slow Motion

Use of motion pictures in slow-motion study of swift, blurred, or transient action is depicted in "Time Magnification," new 16mm. silent film available to technical groups on free loan basis from Eastman Kodak Co., 345 State St., Rochester 4, N. Y. Featured sequences, both in black-and-white and color, were taken at speeds ranging from 1,000 to 3,000 frames per second, representing "slow downs" as great as 187 times. Riveting, cutting, and welding are included in subject matter. Running time is 17 min.

Fueling Which "Ups" Flight Time

"To Turn Ground Time Into Flight Time" is attractively printed 8-page booklet concerning the underwing refueling equipment offered by Parker Appliance Co., 17325 Euclid Ave., Cleveland 12. Designated as Bulletin 520, this promotion piece reviews advantages of below-wing fuel servicing. Pictures graphically explain features and operation of devices employed.

Techniques for Better Quality

Quality control in manufacture is subject matter of 8-page booklet distributed gratis by North American Phillips Co., 100 E. 42nd St., New York City. Two sections are included, titled "Charts Help Diagnose Quality Progress" and "How to Analyze Production Rejects." Drawings and tables supplement the discussion of techniques.

Speeds Making of Header Plates

Information is available from Moline Tool Co., Moline, Ill., on special 29-spindle drilling machine employed in processing aluminum header plates which are used in oil cooling equipment for aircraft engines. Operations many times more productive than formerly are reported possible with unit, which features drum type spindle selector permitting setup for any pole pattern in machine range.

Advantages of Die-Less Duplicating

Entirely new 40-page catalog concerning Di-Acro system of die-less duplicating has been issued by O'Neill-Irwin Mfg. Co., Lake City, Minn. Full line of benders, brakes, shears, and red parters are pictured and described, and numerous "on job" photos illustrate flexibility of machines in experimental as well as standard production work. Several aircraft applications are considered.

Yes, flying is smooth traveling.

As an engineer and builder, you know that no equipment contributes more to the maneuverability, riding comfort and general air-worthiness of a plane than its control cables. That's why so many manufacturers and operators have standardized on U.S.S. American TIGER BRAND Control Cables.

Made from the finest cold-drawn, high-tensile strength steel wire to close tolerances and unvarying quality standards, American TIGER BRAND Excellay Control Cables assure superior performance under every condition of service. They have the sensitive response and reliable strength to translate split-second decisions into direct instantaneous action.

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AVIATION SALES & SERVICE

Red Tape Hurts Personal Flying Air Policy Commission Hears

Joint association testimony blasts slowness of airport program, over-regulation of pilots and planes; specific change recommendations to be made Nov. 1.

By ALEXANDER MCSURELY

Six national associations representing industry and consumer groups which have a vital stake in the future of personal aviation, last week pointed accusing fingers at CAA and CAB in testimony before the President's Air Policy Commission, criticizing specifically:

- Lack of celerity in putting available federal airport funds to work.
- Voluminous and complex safety regulations hampering the private flyer.
- Increased costs of planes resulting from complicated airworthiness requirements that have been imposed on manufacturers.

Specific recommendations to improve the regulatory setup were called for by commissioners at the close of the hearing, with a request that they be submitted in writing by Nov. 1.

Major attack on the bogged-down airport situation and the over-regulation of personal flying was presented in a joint statement coming from the Aeronautical Training Society, Aircraft Owners and Pilots Association, National Aeronautic Association, National Aviation Trades Association, National Flying Farmers Association, and United Pilots and Mechanics Association, and read in behalf of the six organizations, by Beverly Howard, Charleston, S. C., NATA president. Individual spokesmen for several of the associations backed up the general statement with later testimony.

► **Small Number**—After 15 months of waiting since the initial airport administrative appropriations, only 45 airport grants have been accepted and construction work is underway on only 16 airports in the nation, although the \$66,000,000 appropriation is scheduled to provide for construction or improvement of 896 airports, Howard advised the commission. He urged examination of the administration of the airport aid program, to see if it cannot proceed "more expeditiously."

Every time a pilot flies he is probably

in technical violation of one or more Civil Air Regulations, Howard pointed out, due to the confusing mass of complex and conflicting rules, regulations and interpretations which have grown up, and he urged need for drastic revision and simplification of existing regulations.

"Airworthiness requirements imposed on manufacturers of aircraft in the interests of safety have brought about increases in cost which are not necessary," the joint statement continued, "integrity of the American manufacturing industry would, even though no regulations existed, produce

safe satisfactory aircraft for the private flyer to own and operate."

Other joint recommendations of the six associations:

- **Airpower** of the U. S. must be second to none, and fully developed in all aspects—air force, air commerce, and aircraft industry.
- **Long-range** government planning, regularly reviewed and revised, to assure adequate preparedness and benefits accruing to the nation from proper understanding and use of air power.
- **An airport program** which will eventually make every place where people live, play and work, accessible by air.
- **Laws aiding** airports established with private funds, in establishing necessary zoning and protecting airport approaches.
- **Better coordination** of, and extension of aviation education.
- **More accurate** weather reporting for the private flyer and investigation of the CAA's present policy on electronic aids to navigation which are useful to only a relatively few aircraft capable of carrying special equipment.
- **Adequate air marking** program, with funds to provide markers where com-



FIRST GOODYEAR AMPHIBIAN DELIVERY

Sydney Nesbitt, Atlantic Aviation Corp. president, is starting an accelerated service test program with a Goodyear GA-2 three place amphibian at his base at Teterboro (N. J.) airport. Nesbitt and several other operators have been selected by the company to run tests on a limited quantity of the planes and survey its market potential, pending a Goodyear decision whether to put the plane or a modification of it in mass production for the personal plane market. (AVIATION WEEK, Sept. 8).

AUTO-LITE

Aircraft Spark Plugs

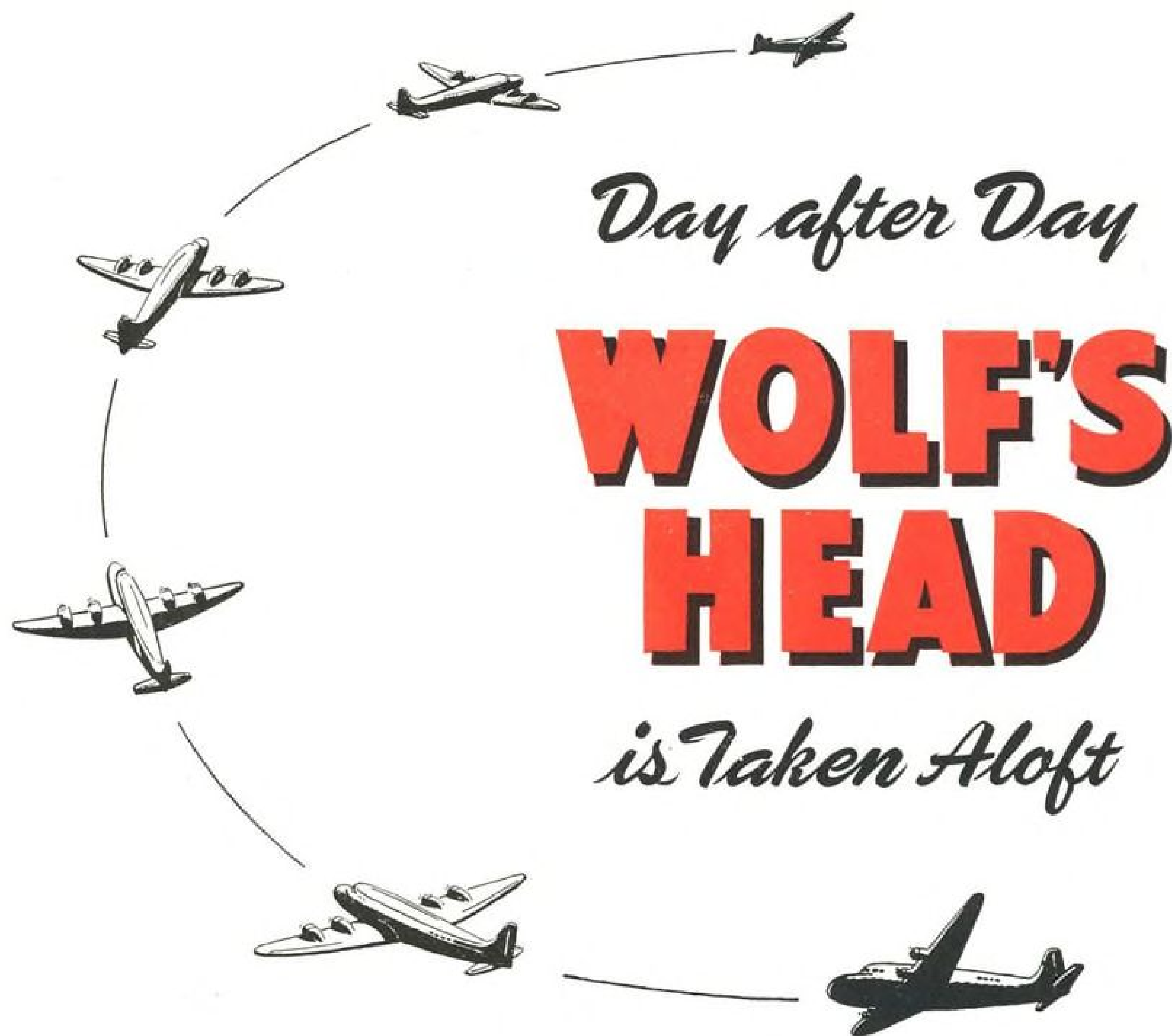
AUTO-LITE aircraft spark plugs all have C.A.A. approval for use on engines as specified. These include Lycoming, Continental, Franklin, Warner, comprising practically the entire volume produced for light aircraft. Send for literature containing complete information.

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munities are not now providing them.

- More accurate and complete statistical data on personal flying, with coordination between CAA and CAB in assembling such data.

- A continuing air reserve training program, carried out as much as possible through civilian agencies.

Capt. Max Balfour, head of Spartan School of Aeronautics, Tulsa, and president of ATS, informed the commission that 75 percent of all pilot training now going on is GI bill of rights training which is building up a backlog of trained technical personnel useful in national emergency. He pointed out that many GI trainees are taking mechanics courses or other courses, and estimated that 90 percent of Spartan-trained GIs are continuing to fly after graduation. He expressed the opinion that curtailment of the GI program would not "wreck our members" (virtually all large fixed base operators) because of their diversified interests, but they would "feel" such a curtailment.

James W. Batchelor, counsel for UPMA, expressed the opinion that "two-thirds to three-fourths of the smaller airports in the country would be closed today if it were not for the GI program." He urged establishment of government credit, through Reconstruction Finance Corp. or a similar setup, to provide long term low interest loans to private airports, asserting that banks were reluctant to extend credit to operators unless they made a strong financial showing. He asked prompt action to remedy the practice by Veterans Administration representatives of "discouraging or advising veterans against taking flight training" pointing out that congressional action authorizing the flight training was not in keeping with such advice.

Clarence Kaufman, president of the Ohio Flying Farmers Association, and spokesman for the NFFA criticized over-regulation, urged further research to develop more useful farm planes, and new agricultural uses for them, and estimated that approximately 60 percent of planes sold to private owners last year went to farmers.

J. B. Hartranft, Jr., AOPA general manager, urged need for simple rules of the road for the pilot, instead of complex regulations, urged need for more attention to personal plane needs for air navigation.

Bombshell Sold

The globe-girdling "Reynolds Bombshell", converted Douglas A-26 flown around the world twice by Bill Odom, has been sold to the Phillips Drilling Co., San Antonio, Texas. Ray Biggs, Dallas (Tex.) aircraft broker, handled the sale, reputedly \$50,000.

BRIEFING FOR DEALERS AND DISTRIBUTORS

JOHNSON PLANS NEW PLANES—Johnson Aircraft Corp., headed by R. S. (Pop) Johnson, designer of the Johnson Rocket and other personal planes, is planning to re-enter the personal plane competition with a plant near Tyler, Tex., purchased from Stewart Aviation Co. Stewart Airport and Tyler Flying Service, owned by W. E. Stewart, are not affected by the purchase. Johnson has announced plans to double the 20,000 sq. ft. floor space at the Stewart plant and to install equipment soon. Eventual plans call for three all-metal models, a single-engine four-place, a twin-engine six place and a two-place craft that is stressed for full acrobatics.

SNYDER OPENS NEW SHOPS—Snyder Aircraft Corp., large Midwest distributor of aviation parts and equipment, has recently completed and opened a new hangar and shops at Chicago Municipal Airport, across the highway from the new Snyder Aircraft building. The shops will handle all phases of overhaul, including instruments, carburetors, generators, starters, magnetos, and radios, with factory-trained personnel and modern equipment, and Snyder will also provide hangar storage and fueling for transient flyers.

NASAO POLICY DECISIONS—State policies on ten important aspects of aviation are on the agenda for discussion by representatives of 42 states at the Ft. Worth Convention of the National Association of State Aviation Officials, Oct. 26-28. Clarence F. Cornish, Indiana state aeronautics director and NASAO legislative chairman has asked for consideration of state policy decisions on: national airport program, personal flying development, economic regulation of air commerce, national air safety, reckless flying law enforcement, non-scheduled air accident investigation, air education, air navigation facilities, aviation public relations, and coordination between various states on aviation matters.

FUNK BEATS BUSHES—Noah Howard, sales manager for Funk Aircraft Co., Coffeyville, Kan., has opened a dealer education and sales campaign, which involves Howard working with individual Funk dealers on sales prospects. A recent door-bell ringing trip in Texas netted five Funk plane sales, largely through personal calls. "We are seeking out the potential purchaser instead of waiting for him to call at the airport, and we expect the results will fully justify the time and expense," Howard stated.

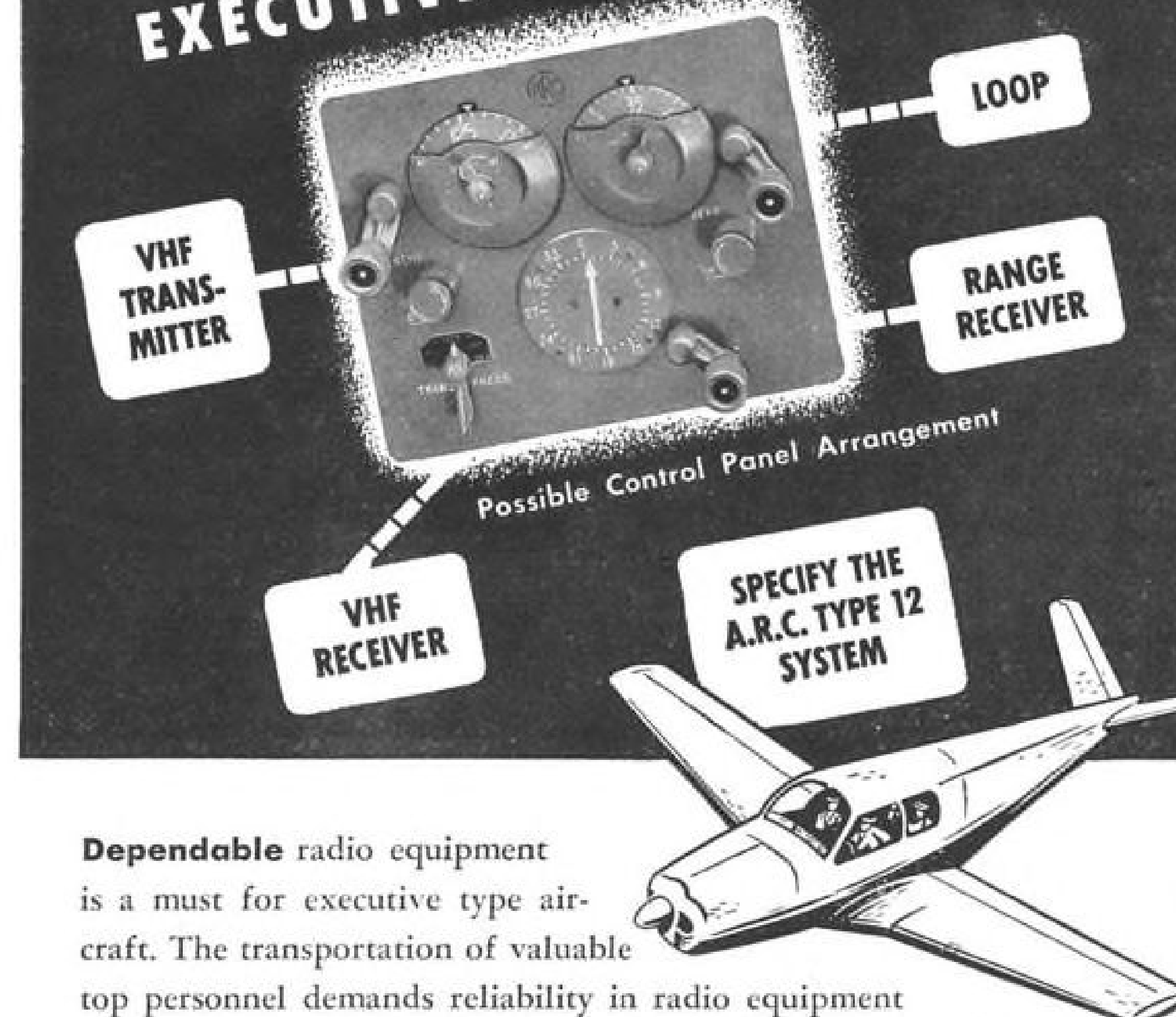
VOYAGER AMBULANCE—Modification kits to transform the postwar Stinson Voyagers and Flying Station Wagons into three-place ambulances are being sold by Mountain States Aviation, Inc., Denver Stinson distributor, which conducted the engineering and tests on an experimental ambulance plane conversion for CAA approval. Conversion provides for a stretcher for the patient on the right side of the cabin, with seats for pilot and attendant on left side. Kit contains stretcher, mattress, special safety belts and attachments, and installation instructions. After the original fixtures have been attached (requiring two hours), the four-place Voyager or Flying Station Wagon can be converted to an ambulance plane in five minutes, and changed back in the same time. The modifications do not detract from speed, takeoff or climb performance of the 165 hp. planes, Bill Klenke, Stinson general sales manager, reports.

QUIET SEAPLANE OPERATION—Noise complaints from water resorts about inconsiderate seaplane pilots, may result in "an epidemic" of local and state laws restricting or forbidding operation of seaplanes in resort areas, CAA Administrator T. P. Wright has announced in a recent warning to pilots. Persons seeking water resorts for quiet boating and fishing do not welcome the plane noise, which appears to be amplified by the sounding boards provided by plane floats or hull, and the unrestricted movement of soundwaves across the water. The real solution, a quiet airplane, is not immediately in prospect, the administrator says, but meanwhile seaplane operating procedure should be as follows: take off as far from shore as possible. Cut takeoff run as short as safety permits. Fly high enough over house to avoid criticism, or arrange flight to pass over very few houses.

VHF TRANSMITTER ATTACHMENT—The new 22-ounce VHF transmitter conversion unit, which has been developed by National Aeronautical Corp., Wings Field, Ambler, Pa., has been adapted to use with the Motorola aircraft transceiver, with highly successful results. James Riddle, NARCO president, reports. One pilot reported contact with the Burlington, Vt., range station while flying at 10,000 ft. over Albany, N. Y., 130 miles away. The three-tube attachment unit makes available as many as six different VHF frequencies, when used in conjunction with the standard set. NARCO has also announced recently a light weight low-cost marker beacon receiver as an attachment to standard personal plane transceivers. This device uses only one tube, and is permanently tuned to receive on 75 megacycles. A war-developed radar crystal is used in place of a second tube. Current models of the marker beacon receiver are designed for use with the Hallicrafters Skvfone radio, standard equipment in Piper, Seabee and Stinson planes, but it is being adapted for uses with other personal aircraft radios also.

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An assembly of A.R.C.-engineered units — all Type-Certificated by the CAA — the A.R.C. Type 12 System provides complete *two way* VHF communication plus LF range reception and loop direction finding. The remotely located major units are controlled by the pilot through compact, conveniently placed control units. It is also possible to mount controls in custom panels to fit the particular aircraft.

A.R.C. Distributors are selected for their ability to provide a dependable working radio installation suited to the requirements of your aircraft. Call on the one nearest you for complete information on the Type 12 System and other fine A.R.C. Equipment for executive type aircraft.

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Buffalo Aeronautical Corp. Buffalo, New York	Commercial Electronics Co. Minneapolis, Minnesota
Southwest Airmotive Co. Dallas, Texas	Skymotive Park Ridge, Illinois
Atlantic Aviation Co. Teterboro, New Jersey	Servaire Corp. of New England Norwood, Massachusetts
National Electronics Lab., Inc. Alexandria, Virginia	Dayton Airadio, Inc. Vandalia, Ohio
Baker-Eberle Aviation Corp. Detroit, Michigan	Turner Aeronautical Corp. Indianapolis, Indiana
Aeronautical Electronics, Inc. Raleigh, North Carolina	Pionrad International Ltd. New York, New York (Foreign except Canada)



C. G. Taylor Plans For New Four-Placer

Taylorcraft, Inc., at Alliance, Ohio, the new organization of aircraft dealers and distributors which has taken over the business of the defunct Taylorcraft Aviation Corp., shipped 15 new airplanes in August. This is two more than were shipped in July and an indication that the company, headed by C. G. Taylor, original head of Taylorcraft, is along the road to recovery.

A recent visit to Alliance by AVIATION WEEK found Taylor doing business in buildings of temporary construction behind the huge brick plant which Armour & Co. purchased after the bankruptcy. Approximately 65 employees were working on assembly turning out about one airplane a day at that time. Assets purchased by the new organization at bankruptcy sale included enough parts for approximately 500 airplanes. Now all it has to do is to put them together and the company has a saleable two-place side-by-side 65 hp. airplane, designated the Model 47.

Price-tagged at \$2,295 flyaway Alliance, at that time, it was expected that a recently announced Continental engine price increase would have to be passed on in a higher price for the model 47. A second Taylorcraft two-place, with an 85 hp. engine, tentatively priced at \$2,500 was scheduled to complete its tests soon.

Washington Farmers Oppose State Licensing

Proposed extension of state airfield licensing and regulation requirements to farmers' air strips was opposed in a resolution passed by the Washington State Flying Farmers Association at its annual convention in Yakima.

Resolution was passed after Joseph P. Adams, state aeronautics director, had revealed that the state aero board plans to institute a field licensing system. Adams later declared the state had no intention of imposing regulation on private fields where no commercial operation was going on.

Robert White, dairy farmer, and amateur pilot, Ritzville, was elected president, with Les Barbee, Buena Fruit Grower, vice president and E. J. Kreizinger, Pullman, reelected secretary.

Convention's annual prize for oldest licensed pilot member went to Roe Sayles, 65, wheat farmer and cattleman, Winona. Youngest active member was Joanne Walters, 16, Wilbur, student pilot and daughter of a wheat rancher. The family of Ed K. Westman, of Lacrosse, with four pilots, won a prize for having the largest number of licensed flying members present.

AVIATION WEEK, October 6, 1947



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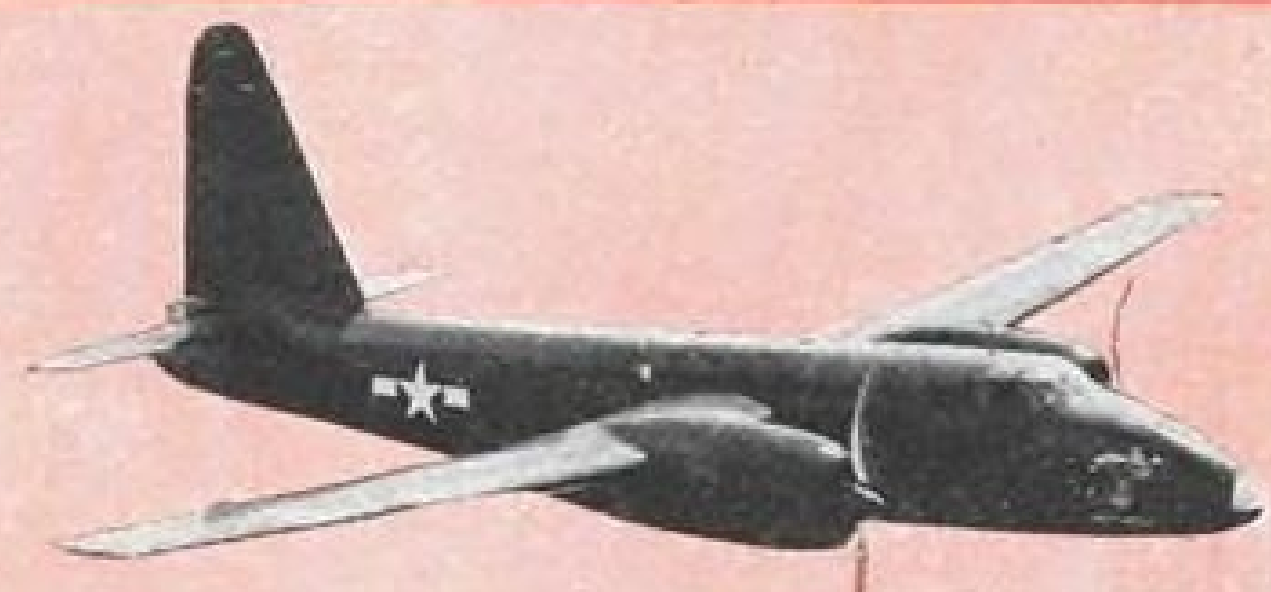
FIRST...

WITH THE "WHO'S WHO" OF AVIATION!

MARTIN 3-0-3 (not illustrated)



MARTIN 2-0-2



LOCKHEED P2-V2

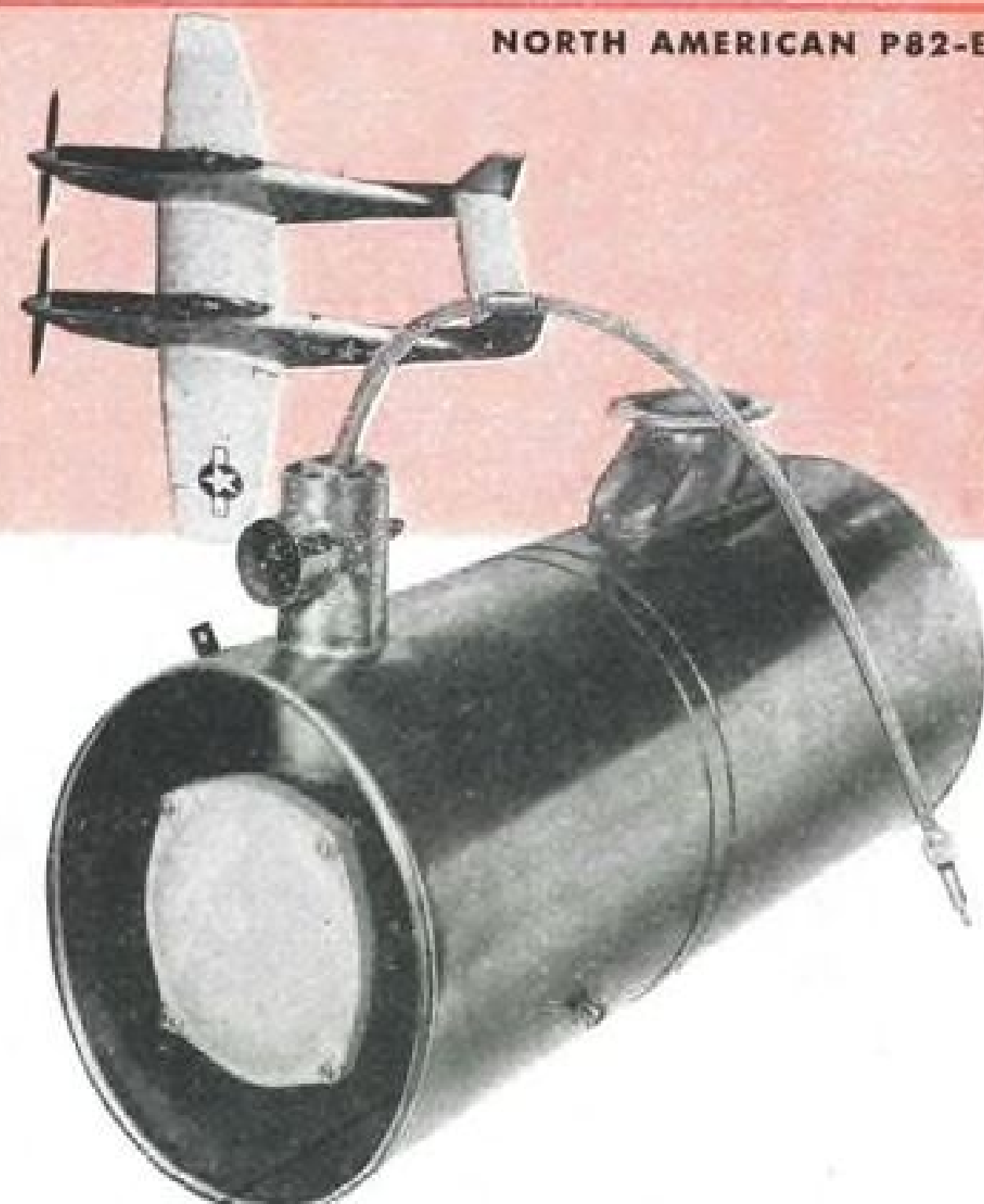


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AIRCRAFT HEATING AND THERMAL ANTI-ICING EQUIPMENT

Washington Airport's 1947 Cost Is \$32,000

Net cost to the government of operating Washington National Airport amounted to approximately \$32,000 for fiscal 1947, according to CAA figures. For the six years since the field opened, the average annual net cost has been about \$10,000. In that period total revenues of \$3,556,115 balanced against \$3,620,431 appropriated by Congress for the airport's operation.

Fiscal 1947 revenues (incomplete) were \$841,381 as against \$873,751 in appropriations for fiscal 1947.

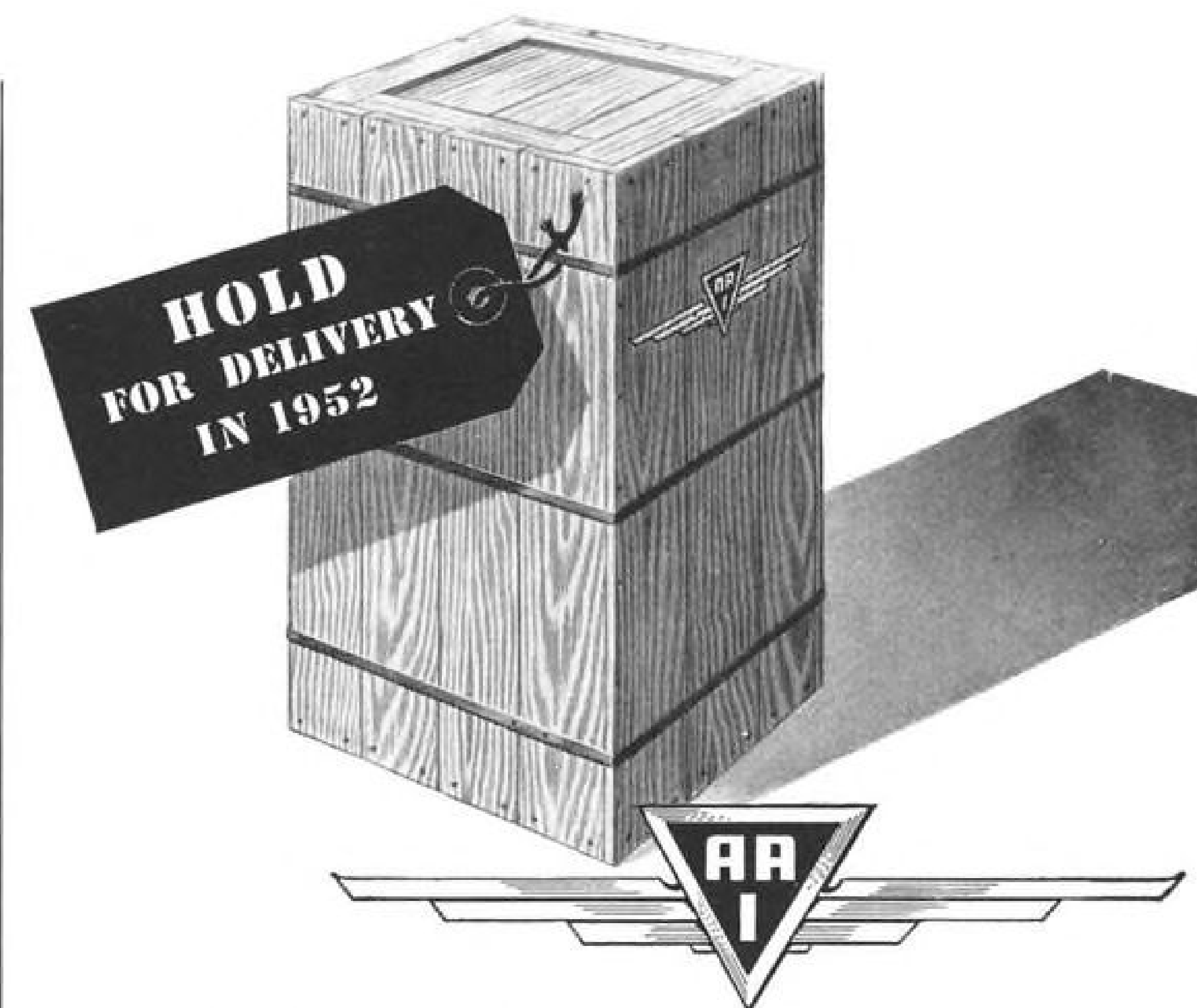
Revenue comes from a variety of sources, including the dimes which sightseers drop into turnstiles to get to the promenade decks for a good view of the airplanes. An average year's income from this source alone is about \$35,000, although the sightseers were excluded from the promenades for a while during the war for security reasons and came back rather slowly when the ban was removed. Five new hangars now under construction will add to revenues from the six now in use, but the first new one won't be ready until about May, 1948.

►Plans Wait—Hervey Law, predecessor of the present manager, Bennett Griffin, left to become airport director for the Port of New York Authority before he could put into being his elaborate plans for a hotel, shopping center, automobile service stations and other revenue producers. High building costs are still delaying these projects as well as one to enlarge the main administration building, now so overcrowded that new tenants have not been admitted.



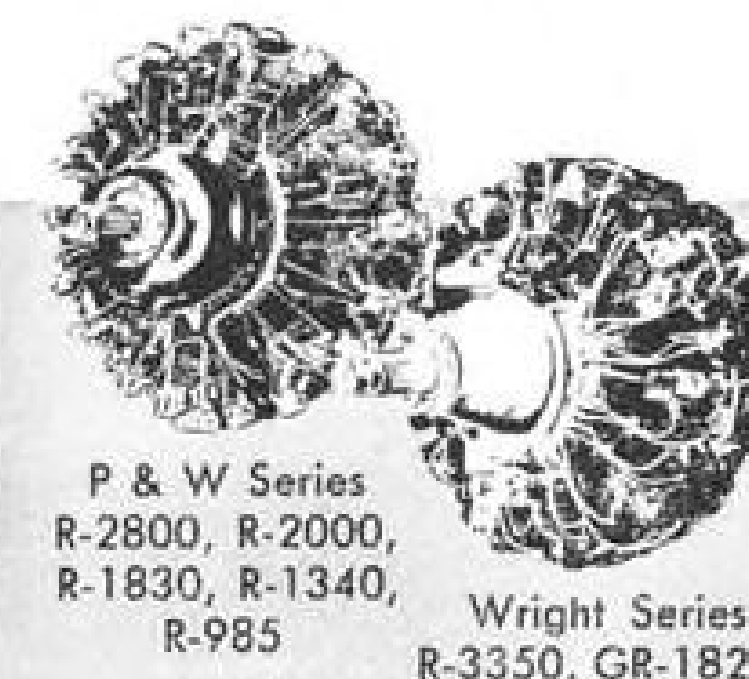
NAVIONS FOR ARABIA

Mallard Air Sales, Teterboro, N. J., handled this five plane order of Navions purchased by the Arabian-American Oil Co. for use in Saudi Arabia, where the company is building a 1,110-mile pipeline from the Persian Gulf to the Mediterranean. Planes will be used as personnel carriers and light cargo transports. Small airports are being constructed along the pipeline route.



Aviation Activities, Inc., has become a part of the international aviation picture—a *permanent* part. Your order for Wright and Pratt & Whitney engine parts will be filled tomorrow—or five years from tomorrow, as you wish. • This is just another way of saying that there is nothing of the "get in and get out" point of view at Aviation Activities—the flying AAI insignia is *here to stay!*

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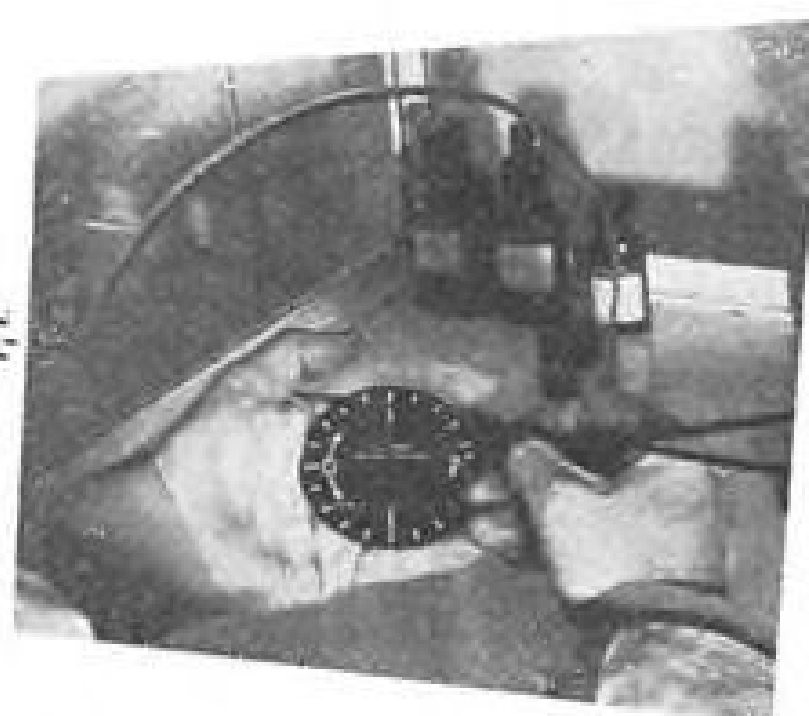
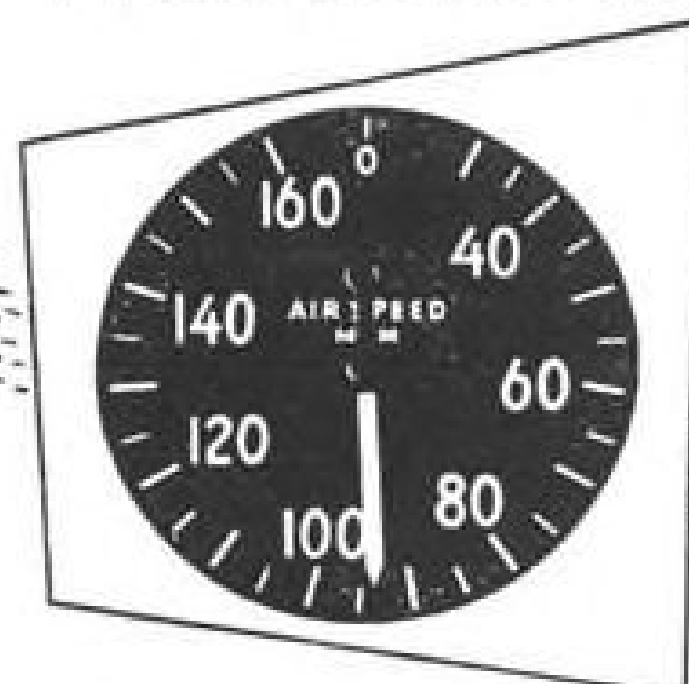
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Schedule Announced for Miles Gemini Tour

(Other Story on Page 33)

A Miles Gemini twin-engine four-place demonstrator plane was scheduled to leave Seattle Oct. 4 for a demonstration tour through the Western and Southern states. After demonstrations at San Francisco concluding Oct. 7, the schedule calls for the following stops: Los Angeles, Oct. 7-9; Tijuana, Mex., Oct. 9; Mexico City, Oct. 11; Brownsville, Texas, Oct. 13 or 14; Houston, Oct. 14; Dallas and Ft. Worth, Oct. 16 through 20; Tulsa, Oct. 21; Denver, Oct. 22; Wichita, Oct. 24; Kansas City, Oct. 26; St. Louis, Oct. 28, and Atlanta, Oct. 29.

L. A. Hackett, Miles Aircraft Co. sales representative accompanying the plane, expects that American deliveries on the craft will start early in 1948 if sufficient customer interest is aroused in the tour, and proper sales distribution contacts are made. Any planes sold in America will be powered with 125 hp. Continentals and will use Aeromatic propellers, because of the spare parts problem resulting from use of British engines and propellers.

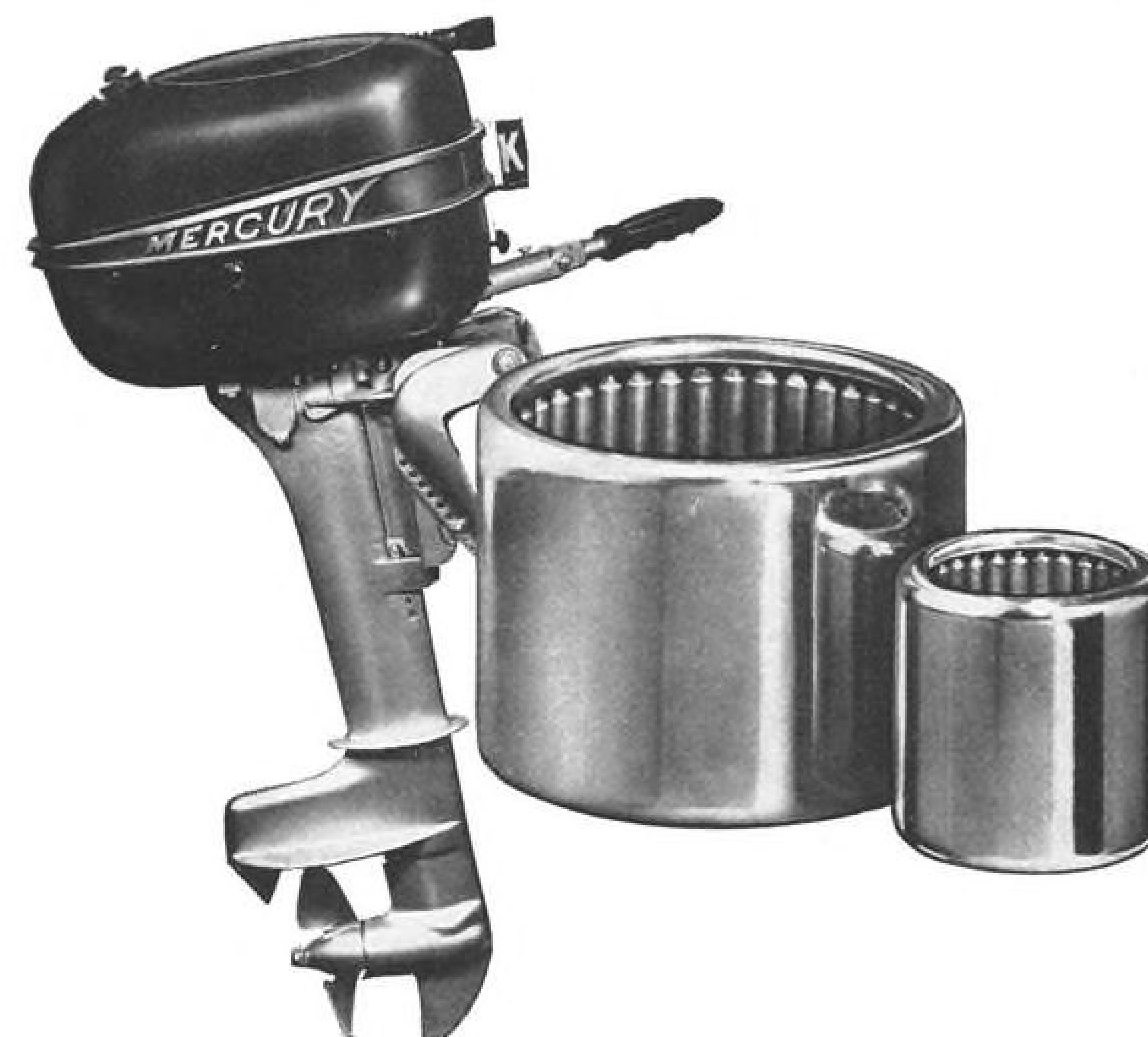
An experimental Gemini is now being testflown at the Miles plant, Reading, England, with Continentals and Aeromatics, in preparation for the alternate engine installation. It is expected that planes to be exported to this country will be shipped as airframes minus engines and propellers, after first test flights with "captive" engines and propellers in England. Final powerplant installations and additional test flights will be made after arrival in this country. The all-wood construction Gemini is expected to retail for from \$16,000 to \$18,000 in this country, including duty.

Crop Seeding and Rain Services in Kansas City

Aerial crop seeding at \$1 an acre, or less for very large areas, is a service being offered to farms in the Kansas City area by Carl Hall and H. A. (Buzz) Hershfield, Jr., of the Aerial Crop Service, Inc., Kansas City, Mo. With special seeding attachments on the company's airplanes, they are equipped for planting alfalfa, lespedeza, clover oats, and other lighter grains and can sow seed at the rate of about 100 acres an hour. The organization also offers a rain-making service, presumably using the "dry ice" method which has been subject of various aerial methods recently, pointing out that "for Western growers who are planting winter wheat a light snow or rain would be very beneficial at the right time."

AVIATION WEEK, October 6, 1947

The "Full Jeweled" 7½ hp Mercury "Rocket Deluxe" outboard motor, manufactured by Kiekhaefer Corporation, Cedarburg, Wisconsin.



Needle Bearings step up performance...

of 2-cycle engines by providing greater mechanical efficiency, longer engine life and reduced maintenance. These outstanding features in turn build sales and win new friends

For Mercury outboard motors...

made by the Kiekhaefer Corporation, Cedarburg, Wis. Torrington Needle Bearings in the wrist pins, connecting rods and crankshaft mains of the power head and on the drive shaft and propeller shaft have conclusively demonstrated the advantages of anti-friction operation in compact, high-speed 2-cycle engines.

Your product's performance and its sales may also benefit from the advantages of Needle Bearings—compact design, high capacity, low coefficient of friction and efficient lubrication. Write for further information.

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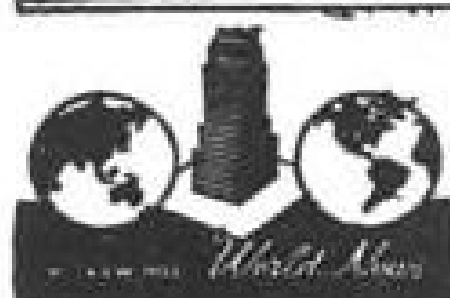
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AVIATION WEEK, October 6, 1947



IT'S IN A NEW COUNTRY NOW

Partition of India, with the establishment of the Pakistan capital at Karachi, gives the new country the largest and finest airport in the East. Expansion of the airport's facilities is planned to meet upcoming aircraft and travel requirements, including enlargement of the administrative building (above) to afford hotel accommodations to transit passengers and air crews.

India Partition Presents Airline Problems

Permission needed for planes to cross new borders; Karachi airport develops.

By J. K. VAN DENBURG, JR.

KARACHI, Pakistan—Use of "Pakistan" in the dateline here may sound strange to world aviation which long has thought of this city as the air gateway to India. But it reflects the many changes that will eventually come into effect in this part of the world as a result of the partition of India.

"Stand still" agreements between the two governments fortunately avert any immediate upsets from the air travel standpoint. But before these agreements lapse—probably about next March—new air agreements will have to be written covering the revision of boundaries and jurisdictions out here.

International air agreements will come first, of course. As a new and distinct member of the British Commonwealth Pakistan must be negotiated with. And part of those negotiations certainly will include the granting of reciprocal rights to a Pakistani line. It is doubtful whether there will be any re-jigging of foreign routes into and through India, although separation of Pakistan from India may make it possible for foreign lines to carry passengers between Karachi and Indian cities since technically sabotage will not be involved.

► **Approval Required**—Internally—rather, continentally—several Indian airlines, notably Air-India, Indian National Air-

ways and Air Services of India, in turn will have to arrange (or have arranged for them by the Indian Government) approval of border-crossing routes they now operate. Part of the reciprocity in this field will have to be extended to Pakistan's one airline—Orient Airways Ltd. which was floated last Fall with an initial capital of \$6,000,000 but still has to go into operation.

Orient will be flying soon, however, because the government is giving it every aid in order that an air link may be forged across the 1,000 miles of India which separate the two Pakistani areas.

► **Airport Development**—Meanwhile, Pakistan is laying plans for the further development of Karachi's Drigh Road Airport, whose 2,500-yd. runways are the longest and strongest in the East. Internal and international movement through the terminal now has reached 11,000 passengers and 76,000 lb. of mail and freight a month, carried on 1,000 planes.

Part of the expansion involves the planning of a new and heavier runway which will take aircraft of the Brabazon and Constitution class. Another section calls for the construction of additions to the terminal building itself so that hotel facilities can be made available to transit passengers and aircrews.

All in all, air officials of the new government are sure that Karachi will continue to increase in importance as an international terminal, and are inclined to deprecate India's surveys of the possibility of developing its own international port of entry on the Gulf.

TACA Adds to Service With Second DC-4 Run

SAN SALVADOR—TACA Airways' addition of DC-4s to its Miami-San Salvador run, planned for this month, will give the carrier its second DC-4 route, the first having been inaugurated last spring between New Orleans and San Salvador nonstop. Daily DC-3 runs between Miami and San Salvador will continue to stop at Belize as well as Havana, and additional feeder flights are made twice a week to and from Belize and San Jose, C. R. A regular daily run between Mexico City and Balboa stops at Guatemala City, San Salvador, Tegucigalpa, Managua and San Jose.

Roots of the TACA system lie in Guatemala, Honduras, Nicaragua and Costa Rica. Each local company, networking traffic within these countries, is a separate subsidiary which furnishes the feeder lines for TACA's international system, linking the five Central American republics with each other and the U. S.

Pan American Airways more or less duplicates the TACA international system and adds a little to it by virtue of the fact that PAA flights (in addition to runs to New Orleans and Miami) do not terminate in Mexico City but continue northward, one to Brownsville and one to Houston. Pan American operates seven flights daily through San Salvador, using both DC-3s and DC-4s. Four go North and three South.

► **Military Not Impressive**—On the military side the situation is not so impressive. The RIAF was never a large force. As near as can be determined at the moment its few aircraft will be split up to give Pakistan one squadron of Tempest fighters and three or four squadrons of Dakota transports.

Although this meager array may be increased later it is most doubtful that Pakistan will develop anything more than a token air force in the near future. Firstly it has other more important things to spend its money on—the raising of its low standard of living by a degree of industrialization—and secondly it appears that it may linger for quite a long time as a Dominion thus enjoying reciprocal aid treaties which will assure it of British military assistance should the need ever arise.

In short, it will be an important figure in the world air transport picture by reasons of location alone.



How to whip the "potatoes"

THAT STUTTERING of a rough-running engine which sounds like "Put-put-put potato" is enough to drive a pilot cuckoo! One way to help squelch these annoying "put-puts" is to stop regularly at an airport offering Standard Skyway Service.

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For instance—one way to whip the potatoes is to ask your Skyway dealer for a Stanovim Treatment. Stanovim is a 100% petroleum solvent that's made to free stuck or sluggish valves.

So remember, for extra-smooth air time, drop in for Skyway Service by skillful, cordial, Standard Oil airport dealers. They're ready to welcome you at hundreds of convenient midwest airports.

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IATA Clearing House Volume at New High

LONDON—Peak summer traffic on the international airlines boosted the volume of transactions in the International Air Transport Association clearing house to an unprecedented total of \$5,500,000 for July. At the same time, the ratio of accounts settled in cash to those completely offset by clearing house entries dropped to a new low of less than 15 percent.

Total turnover in the clearing house has increased steadily since its opening here in January. The previous record turnover was \$4,000,000 in June.

The IATA clearing house now handles interline transactions for more than 20 IATA member companies, balancing against what each line owes to other companies the amounts which are owed it. In settling in cash only for the remainder, the company eliminates a large amount of bookkeeping as well as the risk and charges involved in foreign exchange dealings.

Australian Airlines Continue Plane Orders

MELBOURNE—Current plane-buying programs of major Australian airlines will not be affected by new retrenchments in dollar expenditure because orders are already covered by license and advance payments.

The ban on non-urgent trips abroad may seriously cut into passenger bookings of Australian trans-Pacific services.

Four Australian airlines have bought or ordered 20 new aircraft valued at \$14,000,000: Trans-Australia Airlines, five Convairs and four Skymasters; Qantas Empire Airways, four Constellations; Australian National Airways, five Skymasters; Commonwealth Pacific Airways, two Skymasters (used by ANA).

The recent Tudor II disaster has put a question mark behind Australian plans to replace American craft with British machines. The Tudor was earmarked to take care of further expansion.

Meanwhile, Trans-Australia Airlines, year-old government air service, plans to inaugurate scheduled north-south transcontinental flights between Darwin and Adelaide Nov. 1 if legal obstacles arising from constitutional limitations on government operations can be overcome. Qantas Empire Airways will start regular service to Japan in October if the U. S. State Department approval can be obtained.

Australian air traffic for the year ended June 30 set an all-time record, with 860,111 passengers carried, nearly 70 percent more than the previous period, and freight up 145 percent to 12,247 tons.



Mr. W. W. Davies' position as Director of Engineering for United Air Lines causes him to look at aircraft with a practical eye.

"When United buys a new type, of course we check design, construction and all the rest.

"But we go even farther. We ask, 'How much money can this airplane earn for us? How does payload compare with operating cost?' You see, with us, it's a matter of dollar and cents.

"That's why we're always glad to see 'Honeycomb' used. Because it saves weight. And every pound of dead weight saved shows up on the black side of the operating ledger."

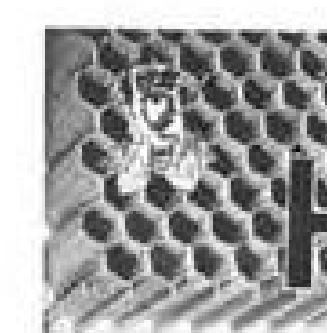
In United Air Lines' DC-6 Mainliner 300's, built by Douglas, Honeycomb is used in many places to save important pounds: Vertical Cabin Partitions . . . Coatroom Shelves . . . Main Entrance Ceiling Panels . . . Magazine Racks . . . Card Tables . . . Lounge Tables . . . Mirror Backing . . . Cabin Stowage Cabinets.

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Full engineering data on Honeycomb is available on request. Write for complete details.



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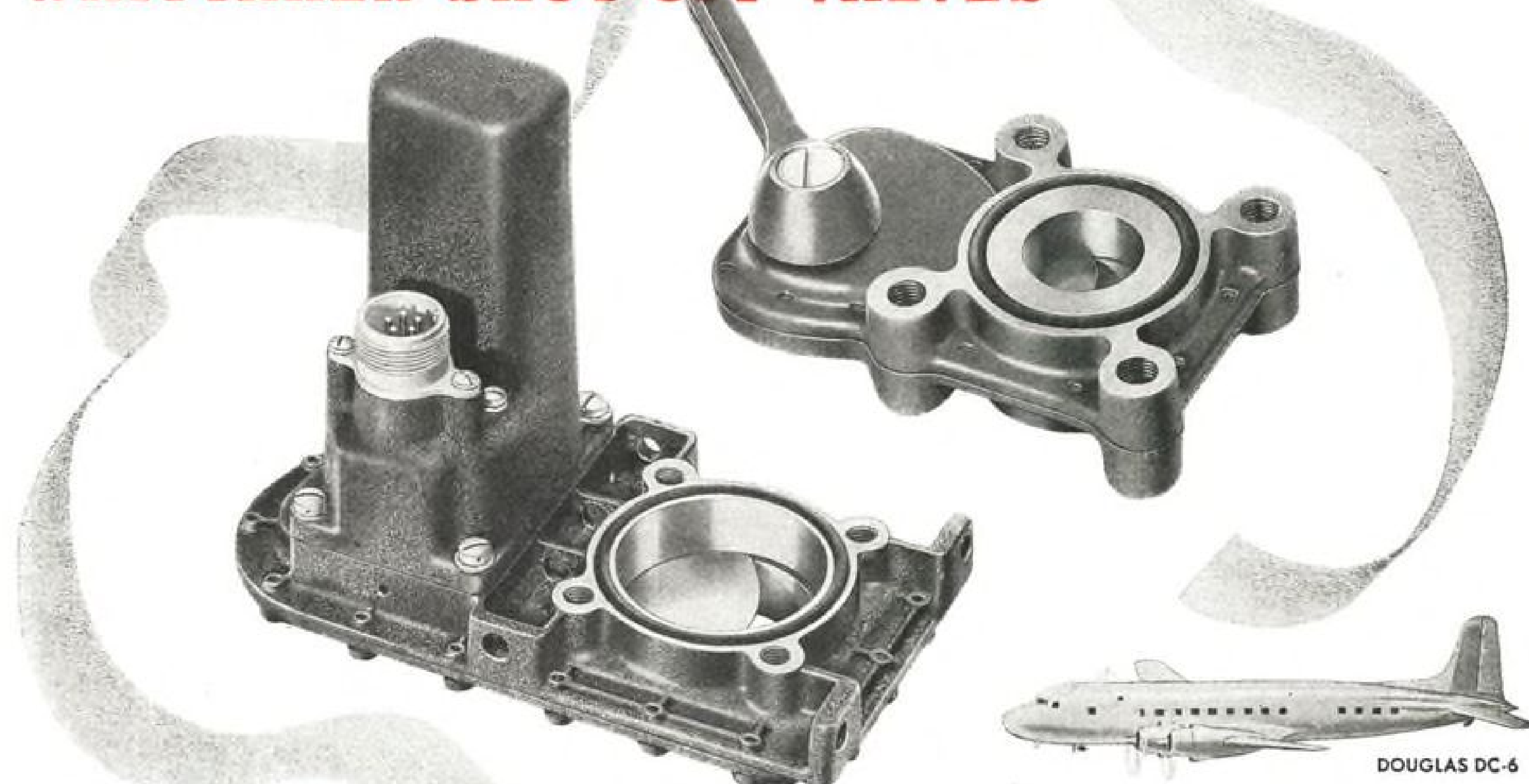
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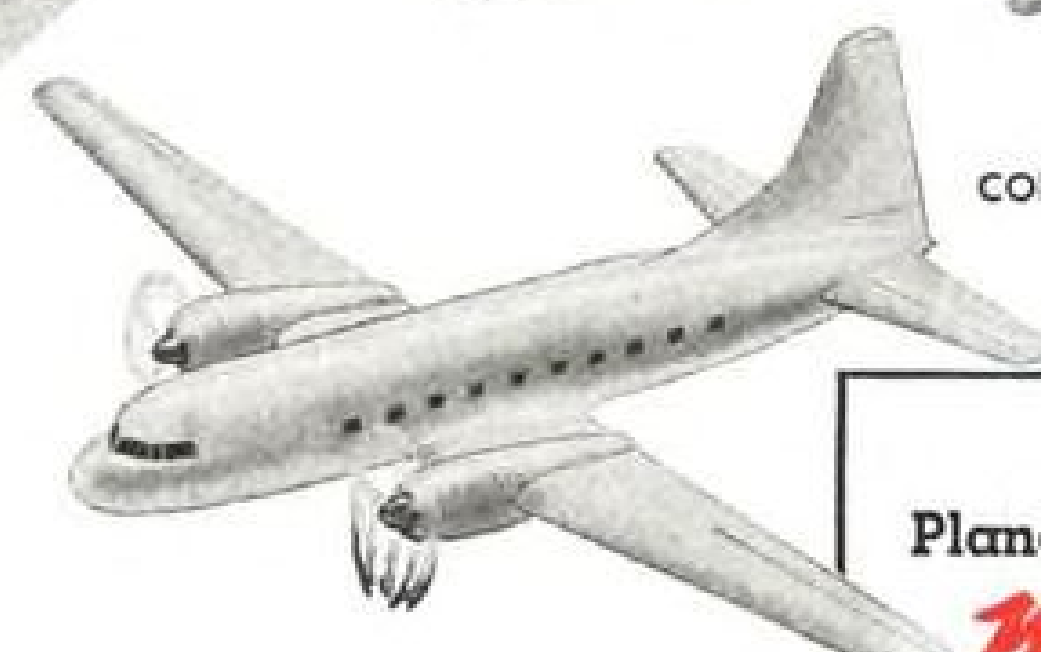
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AIR TRANSPORT

Florida Crash, Cutthroat Tactics Jeopardize Nonscheduled Lines

Burke Air Transport accident and chaotic conditions on New York-San Juan route likely to bring CAA-CAB action affecting all uncertificated operations.

By CHARLES ADAMS

Serious repercussions affecting non-scheduled passenger-carrying airlines in all parts of the country are in prospect as the result of dog-eat-dog practices on the New York-San Juan route and forthcoming reports on the accident in which a heavily-loaded DC-3 crashed into a Florida swamp last summer.

Investigation of the crash, together with allegations made by one carrier against its competitors on the Puerto Rican run, have caused considerable concern in CAA and CAB. A year ago, the board cracked down on a number of New York-San Juan operators for flying with a frequency in excess of that permitted by nonscheduled regulations.

► **CAA Action**—Cause of the crash which killed 14 occupants of a Burke Air Transport DC-3 near Melbourne, Fla., last July has not yet been determined officially. But testimony at the accident hearing and subsequent investigations reportedly have spurred CAA inspectors to a series of surprise visits to airports frequented by uncertificated passenger-carrying lines.

Testifying at the hearing, CAA and CAB officials said the Burke DC-3 left

Newark for San Juan with 33 passengers and a crew of three. Two persons aboard allegedly had no seat or safety belt available and were not shown on the passenger manifest. "This manifest," according to a CAB official, "was also false as to weights, which showed a takeoff load of 25,119 lb. when the actual load was 27,247 lb. It made an overload of about one ton."

► **Violations Seen**—Investigators said the plane's pilots had been flying 24 hours and 37 minutes out of the 37 hours and 50 minutes elapsed time prior to the accident, "the greater part of the roundtrip flight (from San Juan to Newark and return to the point of the accident) being in darkness." The aircraft flight logs were not completely filled out, testimony revealed, with the empty weight, loaded weight, wing area, control area and propeller and engine data among the items missing. One log book, it was asserted, indicated better than 1,000 hours on an engine since overhaul.

A CAA inspector stated that not only were seats and safety belts inadequate for the passengers but emergency

exits were not provided in accordance with the Civil Air Regulations. He said the flight log indicated periods of more than 100 hours between inspections of the aircraft. Further, "there was considerable question as to the airworthiness of some of the parts removed from the wrecked plane."

► **Other Case Cited**—Asked if he had occasion to bring up to the mark any other nonscheduled operators for carrying overweight, the inspector said he had quite recently filed two violations on companies in regard to noncompliance with regulations. "One of them was slightly over 2,400 lb. overloaded."

At this point, the following exchange took place between the CAB safety hearing examiner and the CAA inspector:

Examiner: "What action was taken against the operator (with the 2,400 lb. overload)?"

Inspector: "No hearing was held on it, and the operator was fined \$50."

Examiner: "How would you figure this operator would make out on the deal if he paid a \$50 fine and succeeded in carrying a ton overweight? Would you figure he made a profit out of that, or that the fine was sufficient to make him not do it any more?"

Inspector: "The action was not sufficient to deter anyone from carrying an overload. He made a profit at it."

Examiner: "Do you consider Burke Air Transport a fair sample operation?"

Inspector: "I would say it is an average operation."

Examiner: "Not a horrible example?"

Inspector: "Not necessarily."

The CAA inspector said there have been only two men to keep tabs on nonscheduled operators in almost the entire state of Florida. He added that in the Miami area alone about 42 nonscheduled operators were using around 226 transport type aircraft last summer.

► **AAXICO Petition**—Meanwhile, the American Air Export & Import Co., Miami Springs, Fla., has petitioned CAB to suspend or revoke the letters of registration of eight other uncertificated lines on the New York-San Juan route. AAXICO charged its competitors with conspiring to avoid the filing of passenger tariffs in accordance with CAB's economic regulations.

"Fares charged by the respondents and by their travel agents for passenger transportation between New York and Puerto Rico are so low as to be a menace to the public, in that under such fares no reserve can be set aside for maintenance, repairs, engine changes



SEATTLE-TACOMA IN COMMERCIAL USE

Commercial operations started last month at Seattle-Tacoma airport, 12 miles south of Seattle. Northwest and Western airlines are operating from the new \$1,213,000 hangar (above) built by NWA, Western sharing the facilities on a cooperative basis with NWA personnel servicing WAL planes.

and regular operation, as a result of which faulty equipment is being or will be used. Flying passengers at cut-rate fares necessitates the overloading of a plane in order to make a profit and also compels the carrier to require his air crew to fly more hours than safety permits."

► **Travel Agents Involved**—The noncertificated air carriers conference, representing companies which have filed tariffs with CAB, has sought an injunction in U. S. District Court in New York against eight travel agents which allegedly sell cut-rate tickets to the Puerto Rican population of New York. It is charged that the travel agents sometimes advertise New York-San Juan fares as low as \$25.

When purchasers seek tickets at such rates they reportedly have been told they are sold out but that tickets from \$60 to \$70 are available. When a plane-load has been signed up (charging all the traffic will bear), the agencies allegedly try to charter a plane as cheaply as possible, pitting the operators against each other in cutthroat bidding.

Higher Mail Pay For Feeders Eyed

Mail relief for the six feederlines which started operations during the past year has been proposed by CAB in a series of show cause orders issued late last month.

The carriers affected—Empire, Monarch, Southwest, West Coast, Florida and Challenger—suffered operating losses of more than \$1,160,000 during the first half of this year on their current temporary mail pay of 35 cents a plane mile. While being of substantial help, the proposed new temporary rates, ranging downward from 60 cents a plane mile, are not expected to erase more than half of the feeders' past deficits.

► **Rate Will Drop**—CAB's latest formula would grant each of the six feeders 60 cents a plane mile for approximately the first six months of operation. This rate would drop to 55 cents a plane mile during the next three months and decline 5 cents more each succeeding three-month period until approximately 18 months from the inauguration of service mail pay would be 35 cents a plane mile.

In proposing the higher rates for the initial periods of feeder operation, CAB admitted that the present temporary mail pay is inadequate to prevent exhaustion of the short-haul carriers' working capital. During recent months, several feeders have made urgent appeals to the board for more mail pay, one company stating it would be unable to continue operations without it.

► **Different Formula**—Pioneer Air Lines, the nation's first feeder, is not included

Landis Sees Slur

CAB Chairman James M. Landis has characterized as "libelous" a letter written to him by Mayor James A. Rhodes of Columbus, O., in which the board's decision in the Great Lakes Area case was criticized.

Rhodes said the decision protected and extended the monopoly of TWA in the Ohio area, adding that "the question naturally is asked whether you plan to become an executive officer of this airline when your board term expires." Landis said the mayor's letter exceeded the bounds of fair comment and asked for an apology for the statements.

in CAB's latest action. The Texas carrier, which began operations more than two years ago, is receiving a "sliding scale incentive mail rate" from the board.

► **Costs Being Cut**—Meanwhile, a recent study of five short-haul carriers' first six months' service shows they have made considerable progress in reducing operating expenses and increasing non-mail revenues. The analysis, made by John Howard Payne, now with the executive staff of Florida Airways, covers Southwest, West Coast, Empire, Monarch and Florida.

Operating expenses per revenue plane mile flown by the five carriers decreased from \$1.43 in the first month to less than 93 cents in the six months. Non-mail revenues increased from 17.3 cents to 24.4 cents a mile in the same period.

The carriers' average operating costs per revenue plane mile in the six month of their respective services were: Southwest 98.4 cents, West Coast 96 cents, Empire 95.3 cents, Monarch 94.3 cents and Florida 68.5 cents. Florida uses Beech D-18C equipment; Empire has Boeing 247-Ds; and the other three lines fly DC-3s.

IATA Meeting Convenes At Rio de Janeiro

About 300 representatives of 63 airlines met in Rio de Janeiro last week for the third annual general session of the International Air Transport Association. Headquarters for the assembly is the Quitandinha Hotel near Rio de Janeiro, in which the recent Inter-American Defense Conference was held, with President Truman in attendance.

IATA's meeting will cover all phases of international air traffic from technical matters to rates and tariffs. Sir William Hildred, director general, is to present the group's annual report on the international air transport system.

More Freight Rate Reductions Planned

More plans to tumble airfreight rates to rock-bottom levels were disclosed by the certificated airlines late last month as CAB pondered whether to permit the proposed new tariffs to go into effect.

Latest moves found TWA proposing a systemwide all-commodity reduction in rates from a 20 cents a ton mile average to 16 cents a ton mile effective Nov. 7. In addition, effective Oct. 27, the carrier intends to offer a new specific commodity rate of 12 to 13 cents a ton mile for eastbound shipments originating in San Francisco, Oakland, Fresno or Los Angeles and moving as far as Kansas City or beyond.

► **American Acts**—On Oct. 29, American Airlines plans to expand the number of commodities and points which will benefit from new reduced rates (down to 13 cents a ton mile) which were slated to go into effect Oct. 5. Western, Inland and Southwest Airways are to institute 33 percent systemwide all-commodity reductions on Oct. 25.

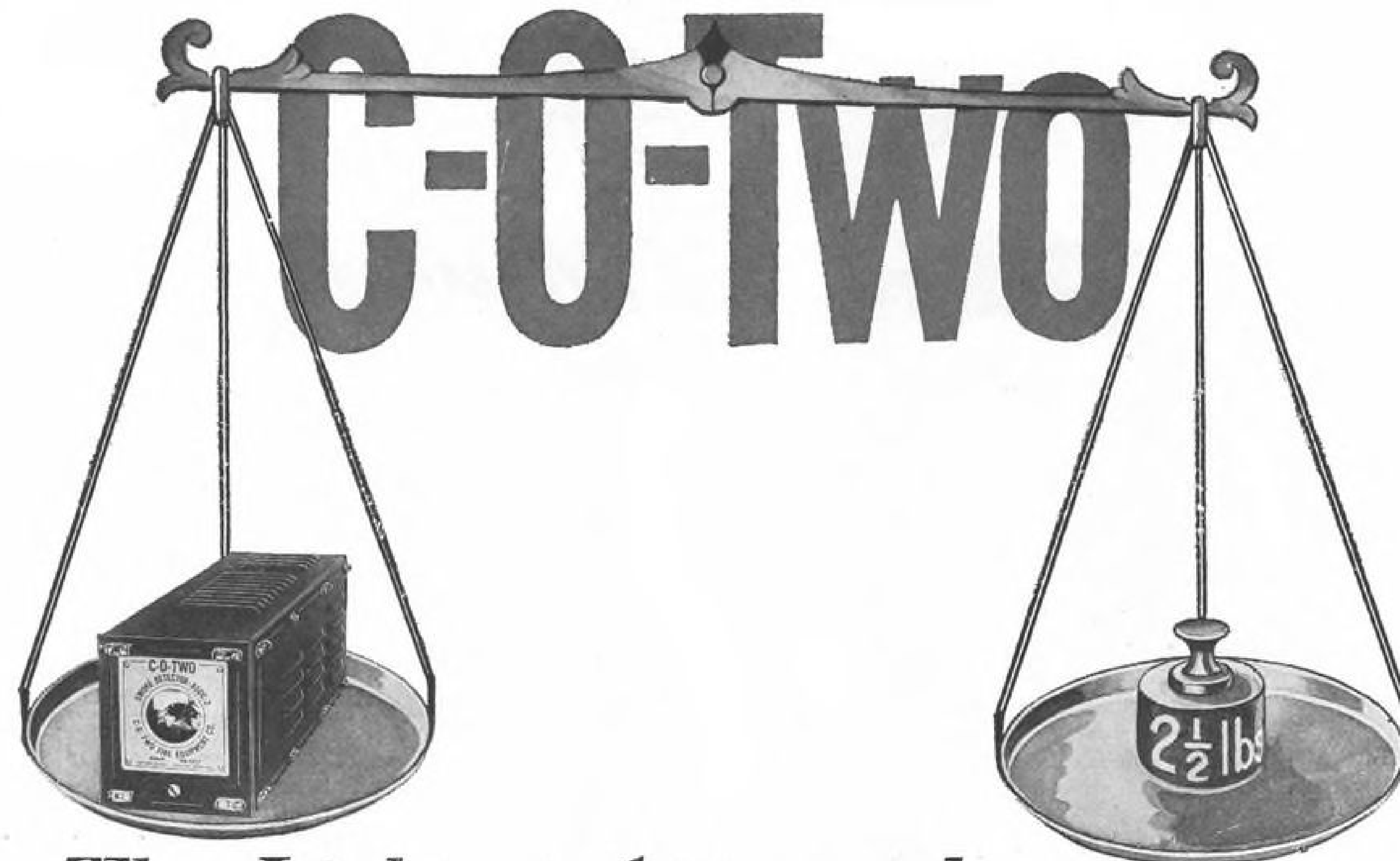
United's specific commodity rate reduction, which was to become effective early this week, will become a systemwide all-commodity tariff cut of 33 percent on Oct. 25 if CAB approves. PCA on Oct. 25 plans to extend its tariff to cover more commodities and more points than were included under the reduction to be effective this week.

► **Replies to Charges**—C. R. Smith, chairman of the board of American Airlines, answering uncertificated carriers' requests that CAB suspend his company's new low freight tariffs, said there is no basis for the claim that the certificated lines have opened a rate war. "With our established organizations and facilities we can operate cheaper than they can. American Airlines has no intention of being driven out of the airfreight business."

Meanwhile, Railway Express Agency, which is seeking to ship cargo via uncertificated operators, told CAB that the certificated airlines have failed to measure up to their public obligations in property transportation. REA said the regular airlines, while lowering freight tariffs, have persistently declined to reduce air express rates which average 61 cents a ton mile.

ICAO Meeting Set

The International Civil Aviation Organization's special conference for consideration of a multilateral international air transport agreement will meet in Geneva, Switzerland, Nov. 3. The session originally was slated for Rio de Janeiro on Oct. 20.



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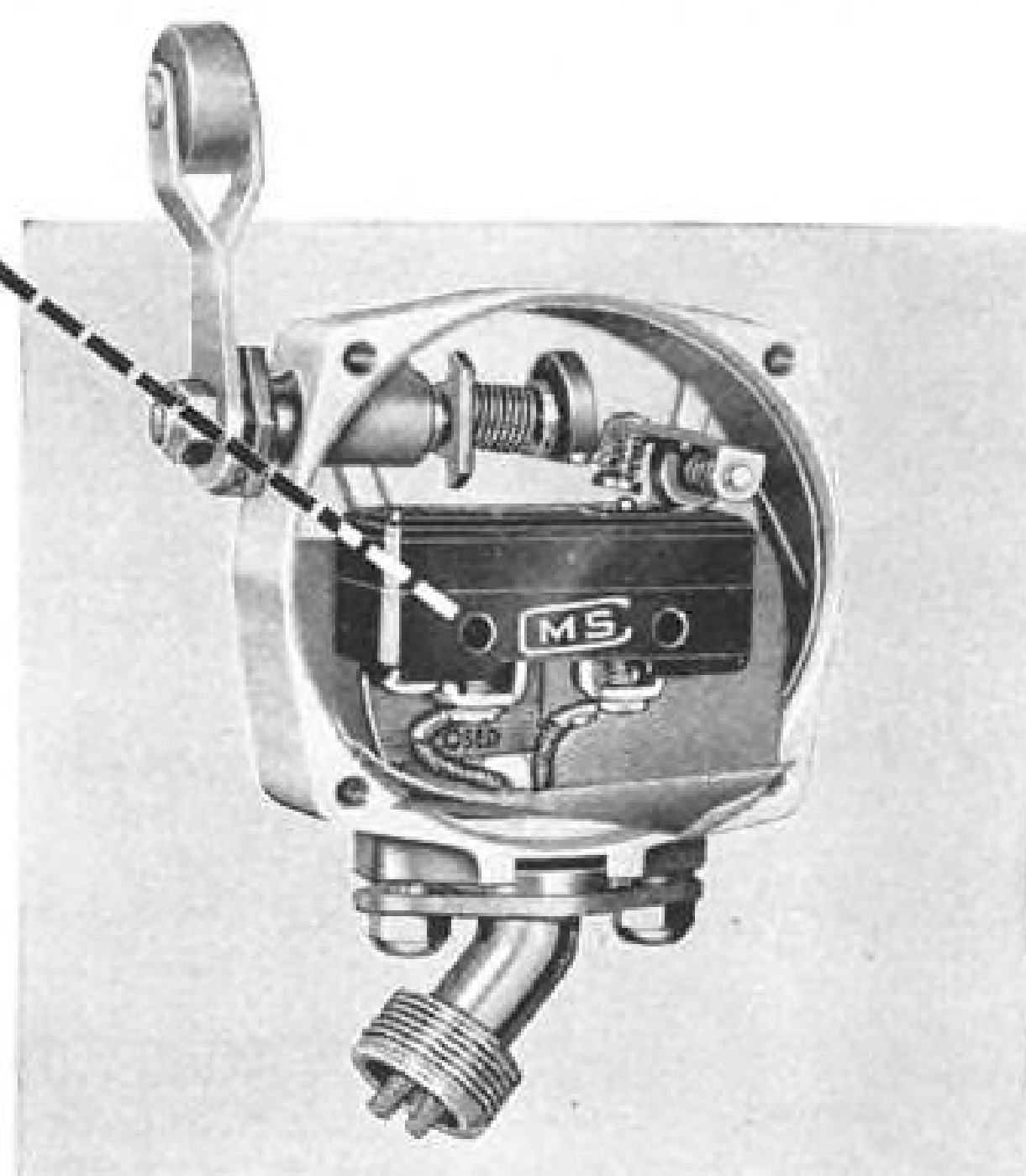
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MICRO BZ-R31 Switch is Army-Navy Aeronautical Standard AN3210-1.



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The illustration directly above shows the arrangement of the MICRO Basic Switch within the housing.

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AVIATION WEEK, October 6, 1947



INTERIOR OF FRENCH FLYING BOAT

France's huge six-engine Latécoère-631 flying boat has begun fortnightly trans-Atlantic flights from Biscarosse, near Bordeaux, to Martinique in the West Indies. The Laté (of which four have been produced at the Latécoère company's Toulouse plant) has accommodations for 46 sleeping passengers or 80 seated passengers, and a crew of eight. Cabins are divided Pullman-fashion and at night are made up with berths for two or four persons. At left is a view down the aisle of the flying boat showing seating arrangements; and at right is one of the four-passenger sections with berths in place. Powered by six Wright Cyclone 1,370-hp. engines, the Laté's normal range is 3,700 miles at 200 mph. cruising speed.

Colonial Eyes Profit On Bermuda Operation

Carrier may supplement service with additional flights before end of year.

Colonial Airlines' new Bermuda route is expected to get above the break-even point this month—within 90 days of the operation's start.

This prospect has developed despite the fact that the carrier inaugurated service to the vacation islands Aug. 1, during the worst part of the slack season. As traffic continues to build up on the Bermuda division, what today is "the tail of the dog" may well become Colonial's most profitable operation.

► **More Service**—Present schedules—one roundtrip daily from New York and a weekend roundtrip from Washington—probably will be supplemented with additional DC-4 flights from both points before the end of 1947. Westbound flights to date have shown higher load factors than have those from New York and Washington to Bermuda, largely because many outbound surface vessel passengers return by air.

An AVIATION WEEK check in Bermuda indicates these passengers are about evenly divided between those who simply want more time on the islands and those disappointed with today's steamer accommodations. It is reported that up to 25 percent of the steamer passengers return to the U. S. by air.

► **Steamship Competition**—This percentage is expected to drop when the large luxury steamships are returned to service. The Queen of Bermuda, now being reconverted from a troop transport, is due back in service some time next year, but probably not before the third quarter. Its sister ship, the Monarch of Bermuda, was destroyed by fire; and there is no indication when other vessels capable of carrying more than 100-odd passengers will be added.

Bermuda trade development board officials report that about 70 percent of the inquiries received indicate prospective travelers intend to go to the islands by surface vessel, many saying they will wait until such transportation is available. However, some of these tourists may easily be converted to air travel, which is now competitive price-wise, with its position standing a good chance of being improved. The days of \$60 roundtrip steamer tickets are now nothing more than pleasant memories. Airline fare from New York or Washington to Bermuda is \$126 roundtrip.

► **Big Tourist Attraction**—Visitors to the islands through August of this year totaled 21,931, and the 1947 total probably will be close to 31,000, compared with 23,395 in 1946. In 1938, best pre-war year,

It is not expected that Great Britain's financial straits will greatly affect

Bermuda as a tourist attraction. Reports that a serious collar quota would be imposed on the islands were quickly dispelled.

West Coast Bid

West Coast Airlines, until recently the only active feeder not seeking extensive new route mileage (AVIATION WEEK, Aug. 4), has disclosed its plans for expansion. The carrier has asked CAB for 571 miles of new links extending from Seattle to Spokane, Wash., via Yakima, Ellensburg, Wenatchee and Ephrata-Moses Lake; and from Portland, Ore., to Walla Walla, Wash., via Yakima and Pasco, Wash.

CAB SCHEDULE

Oct. 7. Hearing involving additional Florida area service. (Docket 1668 et al.)
Oct. 20. Hearing on additional service in California-Nevada area. (Docket 2019 et al.)
Oct. 20. Hearing on Resort Airlines' application to conduct all-expense "sky cruise" operations. (Docket 2377 et al.)
Oct. 31. Oral argument in Northeast Airlines mail rate case. Postponed from Sept. 30. (Dockets 1890 and 1932.)
Nov. 3. Hearing in Boston-Bermuda service case. (Docket 1650 et al.)
Nov. 15. Hearing on board's investigation of Consolidated Airfreight Tariff Agreement. (Docket 2719.)
Nov. 24. Hearing on Mid-Continent's application for alternate Kansas City-New Orleans route. (Docket 1956.)
Dec. 8. Hearing on Mid-Continent's proposed service between Minot, N. D., and Regina, Saskatchewan. (Docket 628.)

Policy Sidelights

Eastern Air Lines President E. V. Rickenbacker and aviation law specialist Gerald B. Brophy emphasized that the present \$10,000 annual salary paid CAB members is inadequate. Rickenbacker said good men probably can't be kept on the Board for less than \$15,000 a year.

Rickenbacker, a dynamic witness whenever he takes the stand, proved again he is a hard man when comparing Eastern Air Lines' efficiency with the rest of the industry. He told the commission that if EAL's cost per mile had been as high as TWA's or PCA's in 1946 his company would have gone deeply into the red instead of making an \$8,279,000 profit before taxes. Eastern, he said, pinches mills, not pennies. The EAL president said he hopes that weather can be eliminated as an obstacle to air transportation in three to five years. "When that happens, there will be so much demand for air travel that the present number of airports won't be able to handle over 25 percent of the traffic."

TWA President LaMotte T. Cohn believes the Army would be better off with a commercial transport suitable to airline needs than with a specialized military transport. He said the airlines should be able to lease some of their planes from the mili-

tary pool but buy most of their fleet, less development costs paid by the government.

Braniff Airways president, T. E. Braniff, hit "the lack of willingness" on the part of Pan American Airways and Panagra to make available to other certificated U. S. carriers their airports and navigational facilities in Latin America. Braniff said he believed a considerable proportion of these facilities were bought by U. S. taxpayers through mail payments, not with capital funds provided by PAA and Panagra stockholders.

Slick Airways wants a statutory provision prohibiting discrimination against uncertificated carriers at airports. Landing fees, gas charges and rentals are boosted on the independents, Slick stated, adding that there is some indication, but no proof, that the certificated airlines "encourage" the discrimination.

Joseph Garside, Wiggins Airways president, and James Ray, Southwest Airways vice president, believe the feeder experiment would cost the nation less money in the long run if the government would issue immediately a development contract for an efficient short-haul plane. They see the Beech model 34 Twin-Quad and the DC-9 as possible answers to their equipment problems.

SHORTLINES

► **All American**—Robert M. Love, president, and other officers were reelected at the company's recent annual board of directors meeting.

► **Capital**—Reports operating profit of \$16,585 in August but a net loss of \$38,330 after deductions for fixed charges. Traffic increased during late August and September after an unexpected summer slump. Total revenue increased from \$1,582,974 in July to \$1,740,297 in August, while operating expenses declined. Since Jan. 31, the company has improved its cash position more than \$626,000 despite a reduction of over \$1,132,000 in current trade accounts.

► **Eastern**—Inaugurated service to Pensacola, Fla., last week.

► **Northwest**—Passenger load factor climbed from 76.40 percent in July to 81.83 percent in August, with a further improvement shown during the first half of September. Company's August profit after taxes was \$565,793 against \$225,796 in the same month last year. Revenue passenger miles for August were 42,609,000 against 38,730,000 in July and 45,261,000 in August, 1946. Net loss for the first eight months of 1947 was \$903,442.

► **Mid-Continent**—Reports traffic increased appreciably in August and September after a bad slump in the spring and early summer. Load factor during the first part of last month averaged 67 percent, 10 points above July's average.

► **Piedmont Airlines**—Has received Hughes radar warning devices for installation on its DC-3s. Feederline expects to have the equipment installed on all its aircraft by the time it gets CAB permission to start operations.

► **TWA**—Reports eastbound trans-Atlantic traffic picked up last month after a summer slump. Company hopes to increase tourist travel to Egypt this winter when traffic to Europe declines seasonally. Domestically, an extensive advertising campaign will be undertaken to promote "quickie holidays" to the Phoenix, Ariz., area during the Thanksgiving, Christmas and New Year four-day vacation periods.

► **United**—Flew about 1,325,845 cargo ton miles in August, a 66 percent increase over the same month last year and 22 percent above July, 1947. Airfreight, accounting for 759,000 ton miles, was up 128 percent over August, 1946, and 30 percent above July, the month before a 25 percent rate reduction was instituted. Air express in August totaled 566,845 ton miles, up 21 percent over the same 1946 month; while airmail aggregated 649,879 ton miles, down 6 percent from the same month last year.

Air Policy Group Drafting Report

Recommendations relating to phases of air transport are already being made.

The President's Air Policy Commission, which last week shifted its hearing spotlight to the aircraft manufacturers, already is making tentative decisions on recommendations dealing with air transportation.

Parts of the report were drafted soon after pertinent testimony was taken so that the Commission will be able to have its recommendations in President Truman's hands in time for transmittal to Congress next January. Chairman Thomas K. Finletter emphasized, however, that changes in the report will be made as warranted by late developments.

► **Patterson Appears**—Last executive of a certificated airline to testify before the Commission was United Air Lines President William A. Patterson. He called for: 1. Abandonment of new route cases until present problems are solved; 2. Realistic examination of past CAB decisions and elimination of uneconomical duplication of services; and 3. Studies to determine where con-

solidations and mergers are desirable.

Preceding Patterson to the stand were Allen Dean, president of the Air Freight Forwarder Association; Joseph Garside, president of Wiggins Airways and chairman of the Council of Local Service Airlines; and Fred M. Glass, president of Air Cargo, Inc. Dean criticized the certificated airlines' "monopoly tactics" against all-cargo carriers and forwarders; Garside pointed to a need for five-year instead of three-year certificates for feeders; and Glass defended the certificated airlines' role in the airfreight field.

► **Other Testimony**—Final witnesses before the Commission turned to aircraft manufacturing were Maj. Gen. Laurence Kuter, U. S. representative to the council of the International Civil Aviation Organization; Tirey L. Ford, chairman of the Sea-Air Committee; Joseph Brent, chairman of Pacific Overseas Airlines; John J. Klak, general counsel for the Independent Air Carriers Conference of America; D. W. Kentzel, president of Aeronautical Radio, Inc., and Samuel J. Solomon, president of Atlantic Airlines.

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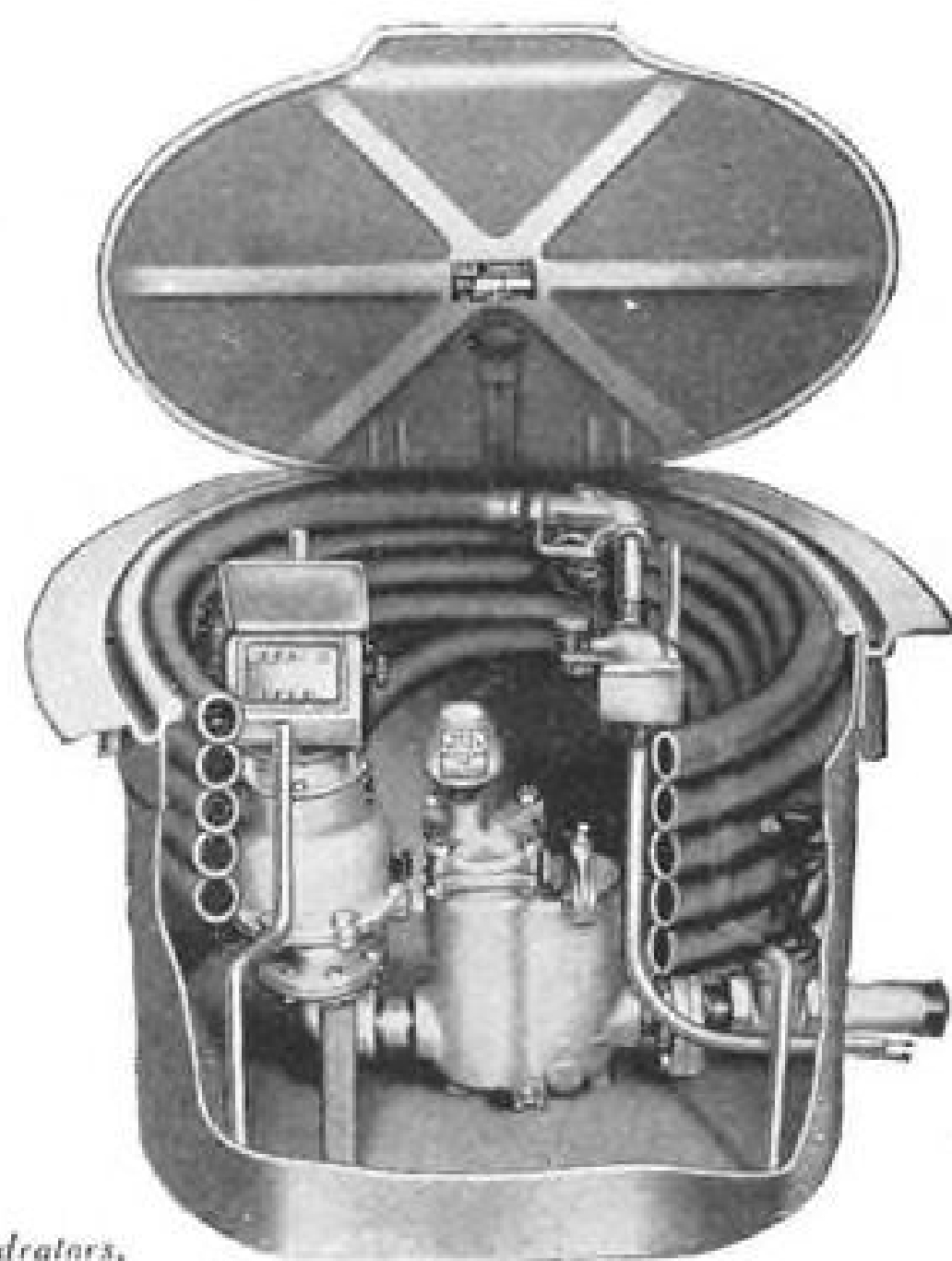
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Slick, Pan American Promote Cargo Officials

Slick Airways, uncertificated all-cargo carrier, has elected W. F. Rogers as vice president, sales and traffic, and Thomas L. Grace as vice president, operations. Former assistant to the president, Rogers has offices at Slick's home base in San Antonio. Grace, who has been operations manager of the carrier, has headquarters at the company's line maintenance base in Burbank, Calif.

Meanwhile, Pan American Airways has named William W. Scott as Atlantic division cargo sales manager. He joined PAA in 1945 and last year became district express-mail supervisor for the United Kingdom.

Other Personnel Developments:

- **Brantiff**—Reginald Brack, recently named general sales manager, has been appointed general traffic and sales manager of the domestic division.
- **Colonial**—Webster Bartram, has become director of the carrier's news bureau.

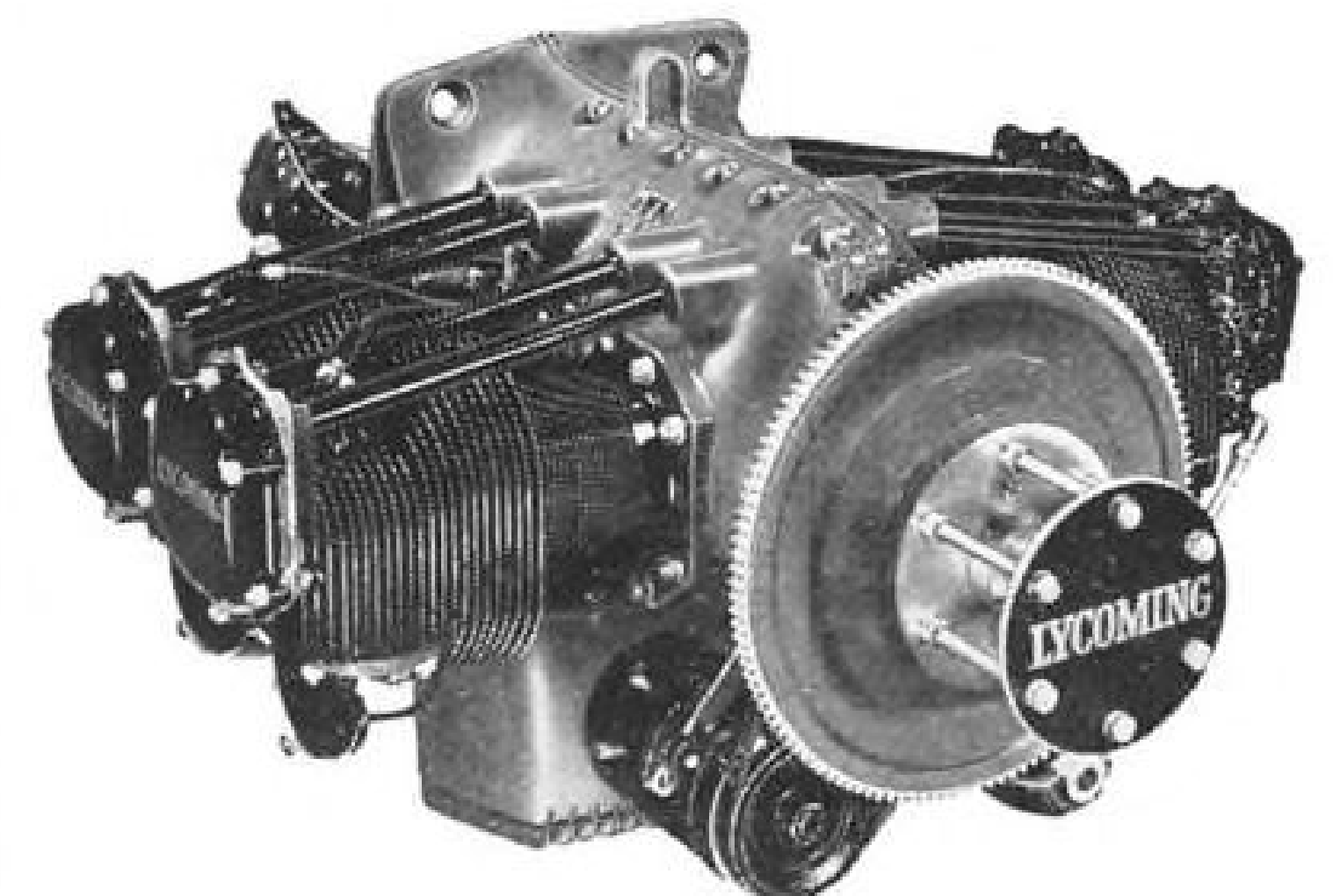
Pacific Island Facilities Taken Over by CAA

Maintenance and operation of airport facilities at Midway, Wake and Guam have been taken over by the Civil Aeronautics Administration. They will become part of the Federal Airways and constitute a link in the chain over the Pacific.

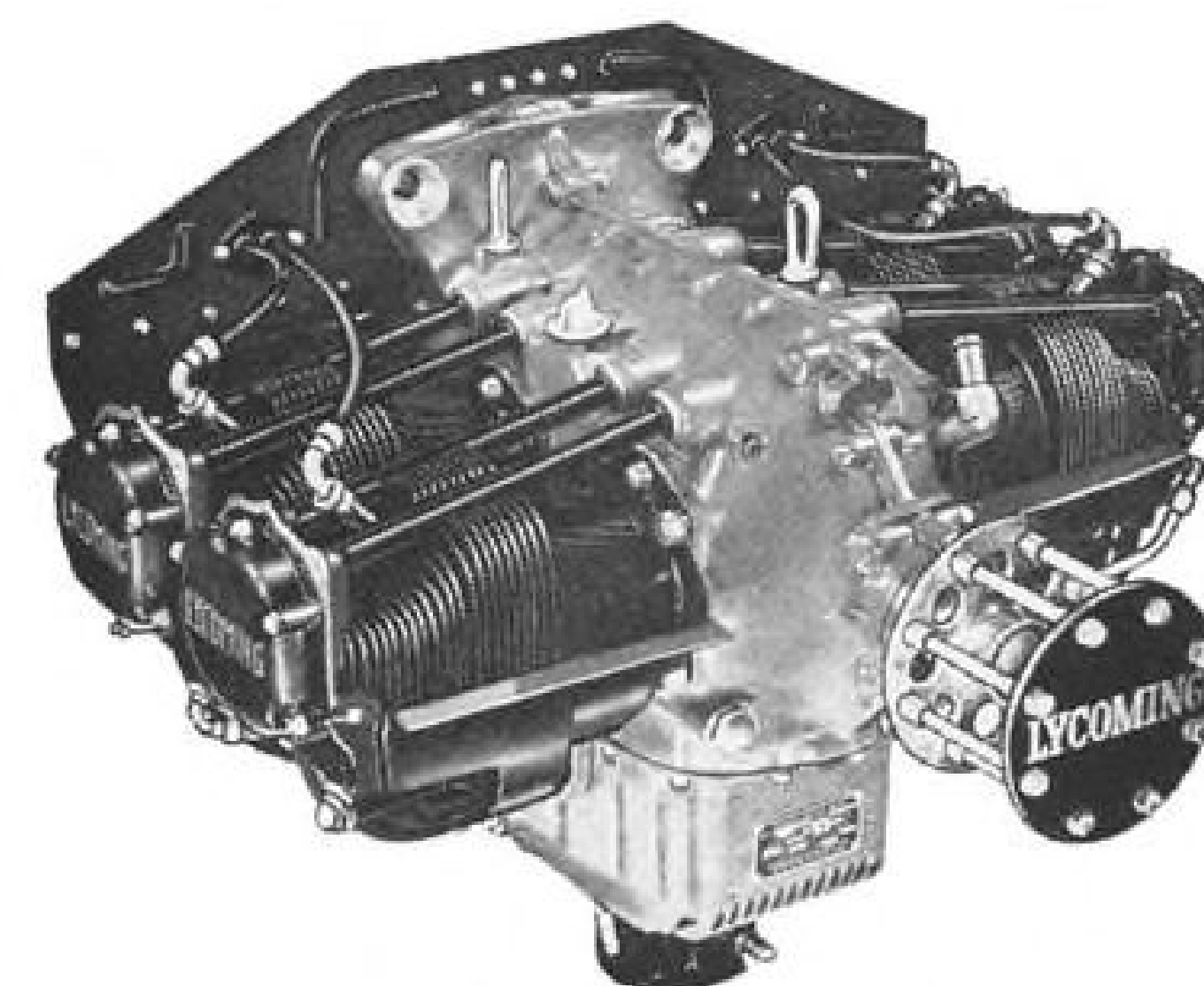
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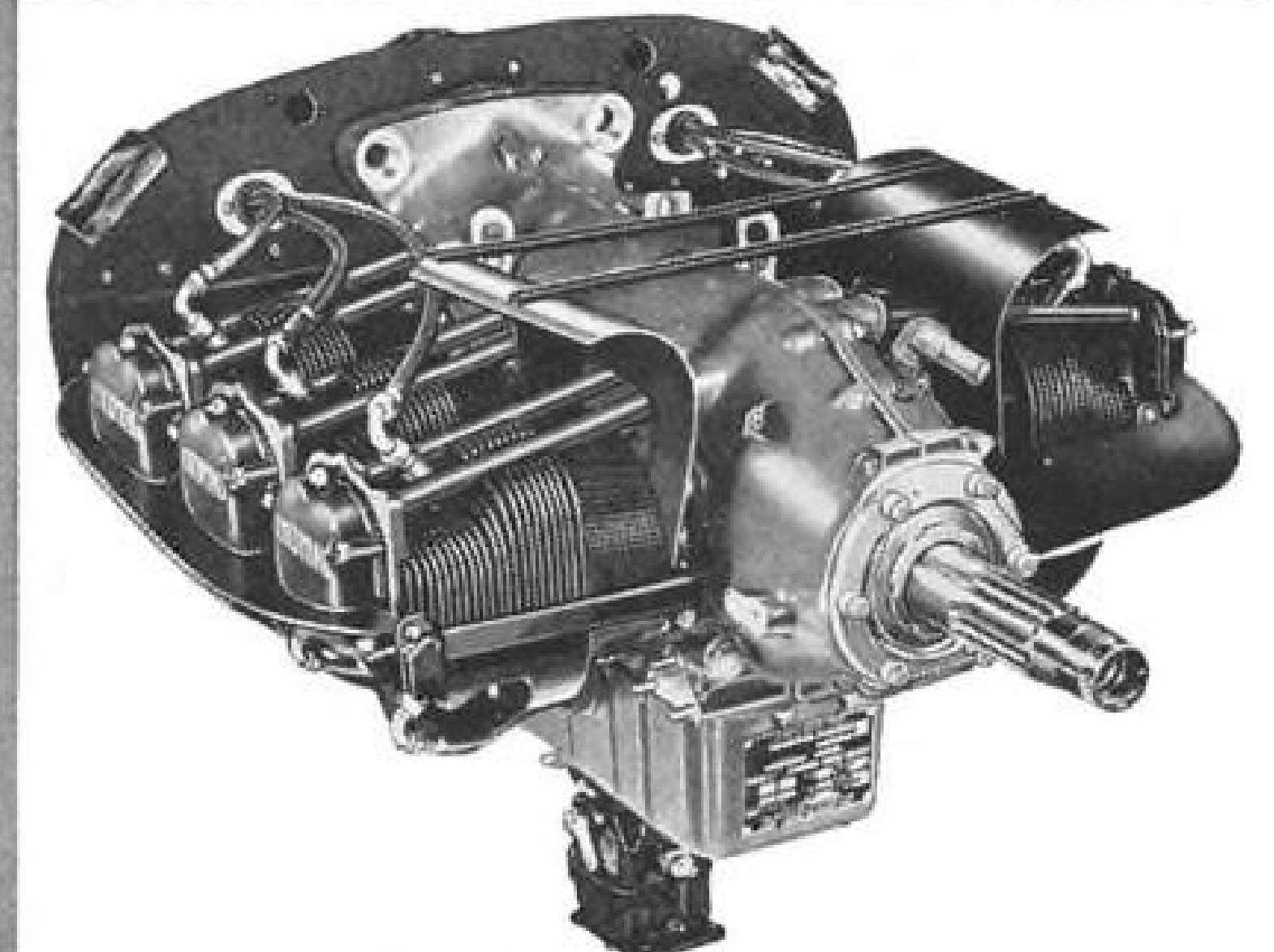
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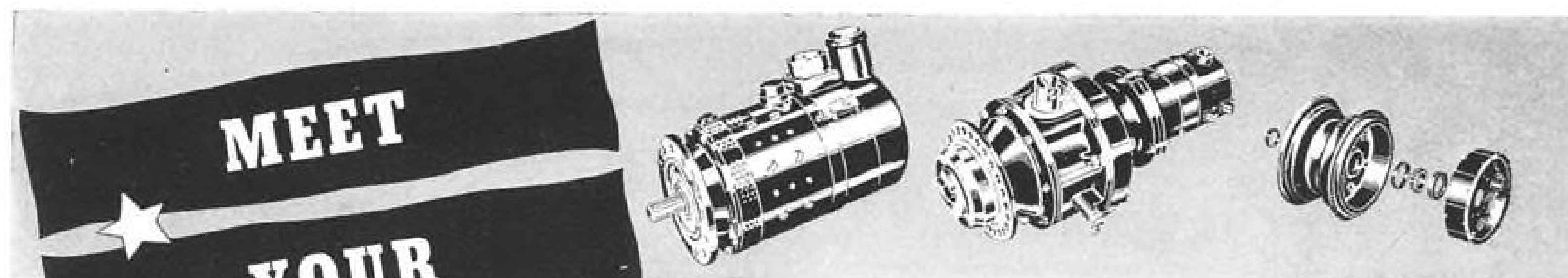
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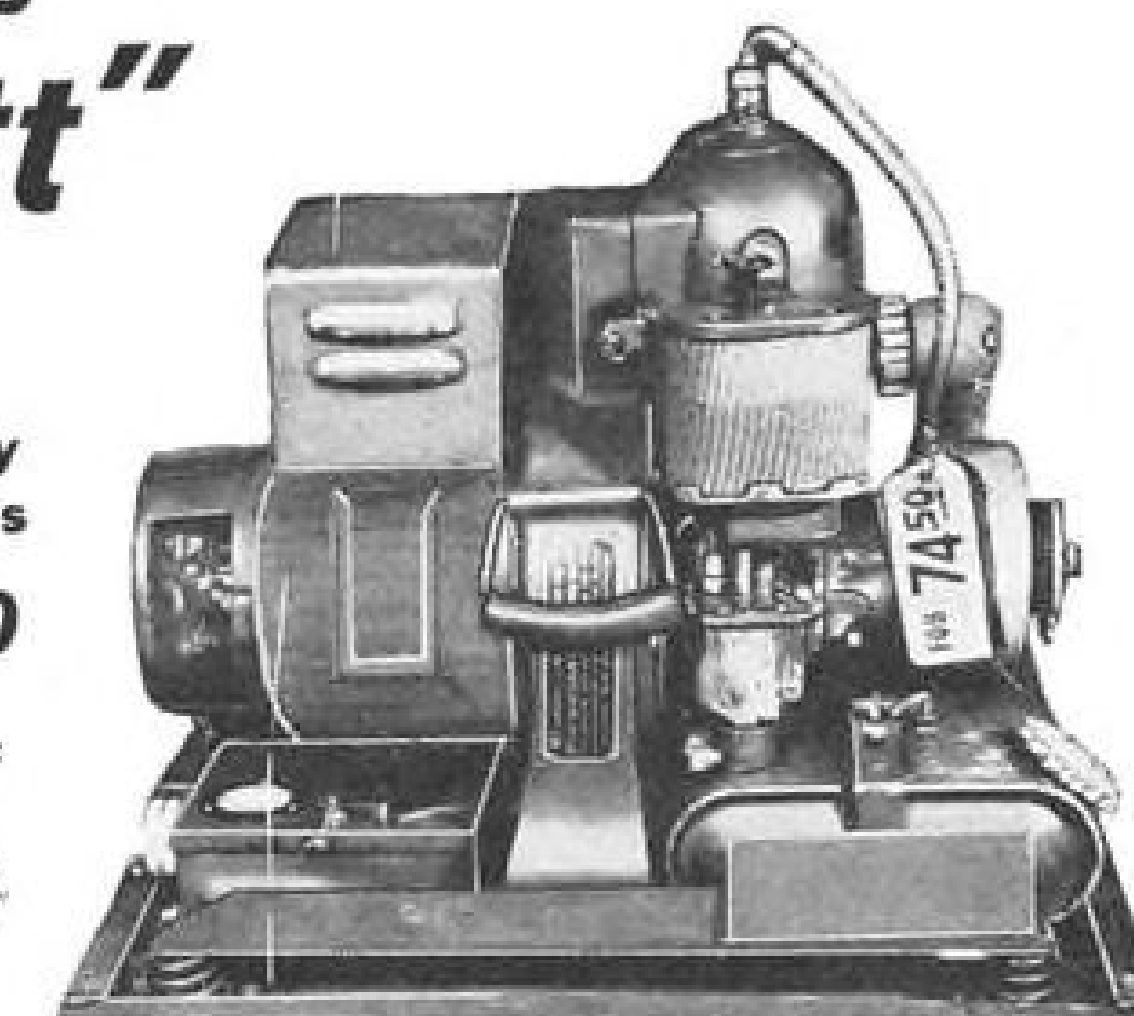
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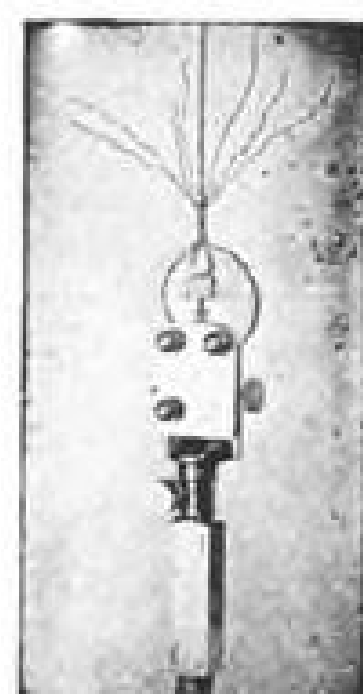
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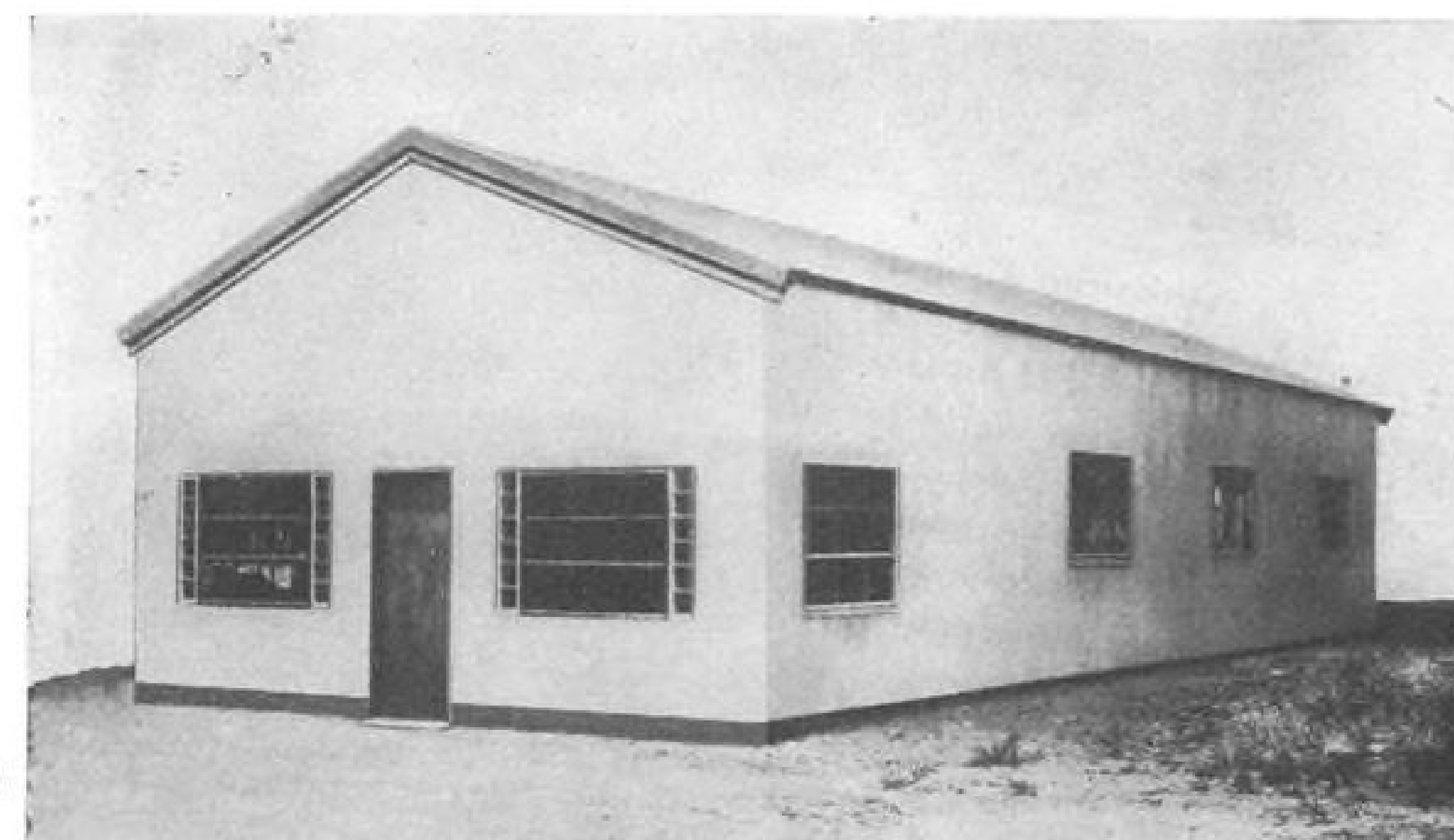
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B-105, 60' x 120'—Brand new "Economy Building" Hangar style, 60' wide by 120' long. Sidewall height 16' to eaves. Rigid arch design with columns on 20' centers. Gable roof with a slope of 5" in 12". This building is equipped with a full sliding door unit in one end. Six steel sash measuring approximately 3' x 5' are also furnished. Entire hangar is completely covered with corrugated aluminum roofing and siding.

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B-104, 80' x 100'—Three complete buildings, 80' wide by 100' long by 14' high to the

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EDITORIAL

DAF Public Relations

We see hope that appointment of civilian Stephen F. Leo as Director of Public Relations for the Department of Air Force foretells a realistic, intelligent attitude toward the public and press.

This statement is made by the publication that has probably mixed it up with Army Air Forces public relations policies and officers more frequently than any other newspaper or magazine.

We have had some dealings with this ex-newspaperman from the Gannett papers in Maine, since Mr. Symington brought him into the War Department as a press aide last spring. We like what we have seen.

It is our understanding that his authority exceeds that of any uniformed general officer. That is all to the good.

Emergencies and Foresight

Nothing is more difficult to plan for than emergencies, regardless of the industry. In air transportation the very discussion of accidents has always been a delicate matter, even within airline companies. But a remarkable loose-leaf, leather-bound booklet recently distributed by United Air Lines to its key employees grasps the problem of accidents boldly and the procedures it outlines must certainly save lives and suffering some day. It organizes the entire coast-to-coast line on an emergency basis within minutes.

The little book, officially titled Accident Manual, assembles in about 100 easily-read pages all of United's flight accident regulations, which heretofore were scattered through the general policy manual, station regulations, a passenger manual, and a separate compendium of general headquarters procedures.

A general discussion covering major accidents outlines the company's philosophy, station manager's responsibility, company personnel and their phone numbers,

Now, if Secretary Symington will give this 38-year old ex-AAF private and captain his head, the new Department of Air Force may get away to a sensible level-headed public and press relations start. The old AAF, dominated by the brass, was never able to get smart publicity wise. But it scraped through because of the public's enormous enthusiasm and respect for aviation.

The new Department of Air Force has stubborn battles ahead to win due recognition, not only from Congress but perhaps from as high a personage as Mr. Forrestal, the ex-Navy Secretary now the powerful Secretary of Defense. The type of public and press relations program conducted by the new Air Force Department is of signal importance to aviation, and the country as well.

personnel involved outside the company, Army and Navy stations, air rescue services, press relations procedures, government regulations and reports, accident reporting by all employees, cargo damage problems, guarding of wreckage, insurance procedure, expenditures at the scene, and procedure involving accidents to other airlines on or near a United station or route; initiating boards of inquiry and investigating and reporting facts.

United's accident manual is based on the realization that organization is paramount in handling accidents. Trained personnel must know what to do, and how and when to do it. "It is team effort and requires the ingenuity and initiative of many individuals and groups. . . . Those persons who have responsibilities assigned to them should at all times be thoroughly familiar with their specific assignments so that they can quickly assume their duties."

Various airlines have certain emergency procedures, but we have seen none to compare with the carefully thought out plan of United Air Lines.

Getting Realtors Air Minded

Are real estate men human beings? The national epidemic of complaints about noise and airplanes has aroused serious doubts on this subject in aviation circles. Although it made few headlines, there was a little meeting in Washington the other day that brought realtors' interests together with representatives of such aviation groups as CAA, CAB and Aircraft Owners & Pilots Association. Sponsors were National Aeronautic Association and Urban Land Institute.

Both sides discovered the others were indeed people. They began expressing their viewpoints and looking toward some semblance of solution. One realtor said he had learned so much he hoped there would be similar

meetings again. He made the surprising statement that while he believes airports as we know them today definitely harm adjacent property values, he feels that a properly constructed and operated airport could increase nearby residential values. You have heard aviation folks say that for years, but never a real estate man.

We think NAA deserves a word of praise for this departure, and hope there will be similar meetings everywhere. Progressive aviation leaders should take the initiative. Why wait until specific local complaints fester into stormy mass meetings when tempers are short and emotions dominate? Aviation never wins in battles like that.

ROBERT H. WOOD

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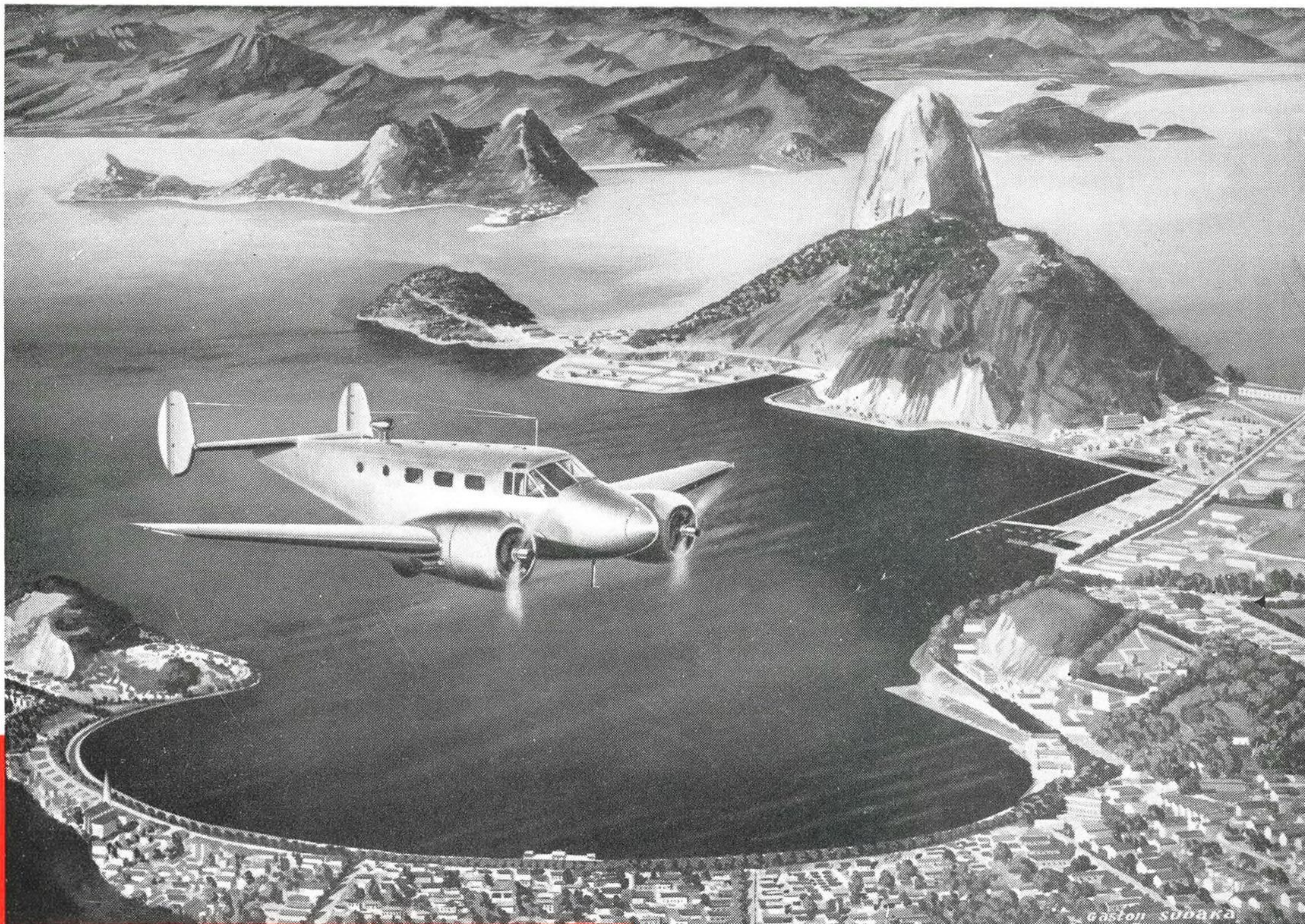
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