

AIR FORCE

THE OFFICIAL JOURNAL OF THE AIR FORCE ASSOCIATION, OCTOBER, 1946



35¢





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VOL. 29 NO. 9

OCTOBER, 1946

AIR FORCE

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AIR FORCE is published monthly at 1406 East Franklin St., Richmond 15, Va., by the Phillip Andrews Publishing Co.

Editorial and Executive Offices: 545 Fifth Avenue, New York 17, N. Y., Mu. 2-2643, Sanford Wolf, Eastern Advertising Manager.

Branch Offices: 333 North Michigan Ave., Chicago 1, Ill., State 4312, Harvey Hayden, Mgr., 816 West Fifth Street, Los Angeles 13, Cal., Michigan 3968, H. L. Keeler, Mgr.

Entry as second-class matter is pending at the post office at Richmond, Va., under the Act of March 3, 1879. Subscription, including membership in the Air Force Association, \$3.00 per year. Single copies, 35 cents. Copyright, 1946, by the Air Force Association. All rights reserved under Pan-American Copyright Convention.

All Correspondence pertaining to the Air Force Association with the exception of that which directly concerns the magazine **AIR FORCE** should be addressed to National Headquarters, 1603 K St., N.W., Washington 6, D. C. Publisher assumes no responsibility for unsolicited pictures, artwork or manuscripts.



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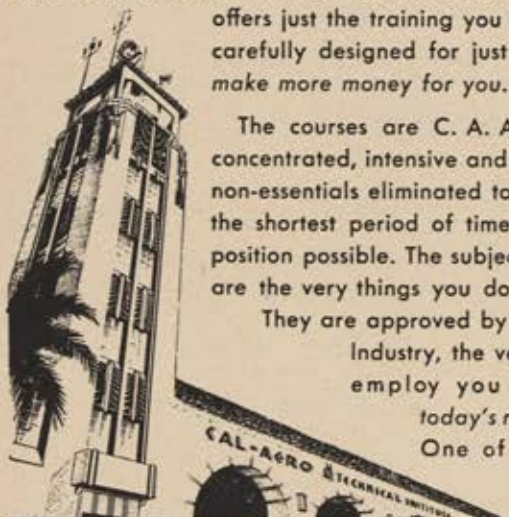
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HANGAR FLYING



The Whaleboat

In Building 82 at Burbank, engineers have been fussing over a remarkable object that looks like a dural whaleboat on wheels. It's the *Constellation's* new Speedpak and it's a lot more useful than a whaleboat, except maybe to whalers.

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belly, full of over four tons of additional cargo. At any stop the Speedpak can be lowered, loaded and lifted in a matter of minutes.

For all its 395 cubic-foot capacity, the Speedpak slows the plane down less than 10 mph, which is peanuts for the five-mile-a-minute *Constellation*.

The Speedpak is a new solution to the cargo problem. But new ideas are old stuff at Lockheed—ideas that make good hangar flying and better air transport.

L to L for L

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Air Mail

Cover to Cover Analysis

The following comments have been received from M/Sgt. J. A. Casey regarding the August issue of *AIR FORCE*. Your suggestions are greatly appreciated, Sergeant, and we'll try to answer them as best we can.

"I still maintain that the article 'In This Issue' is superfluous."

In This Issue has long been a regular department of *AIR FORCE* and is intended to give some background on the authors of various articles and the circumstances which prompted their writing.

"An increase in military aviation topics wouldn't do any harm."

We concur heartily, but this type of material in a postwar world is rather difficult to obtain. We're working on the subject, however, and are making fair progress, so look for more on military matters in future issues.

"Why not give General Spaatz a full cover in a future issue?"

We have a kodachrome on the AAF's Commanding General and intend to use it in a future issue together with the story of his professional career. This will be one in a series of "Air Force Family Album" in which we will publish notable personalities, regardless of rank.

"Since many AFA members are ex-flight radio operators, why couldn't we have a section in each issue devoted to aircraft communications?"

It is likewise our intention to publish as much worthy material as we can find on aircraft communications.

"The article 'AFA News' is great. Keep plugging this item."

We'll print just about everything we can get on the subject and take this occasion to ask that state wings, local squadrons, and individual members keep us informed of their activities.

"Rendezvous is tops! Where is the 5th Bomb Group located now?"

We're checking on the 5th and will let you know as soon as possible through *Rendezvous* which, incidentally, will be confined henceforth to such requests as this. General comment from readers will appear under "Air Mail."

"Minute Men of the Air, What's Ahead for the Helicopter? G-Suits and Glory, and Targets for Today are excellent reading."

Thanks.

"Fun on Floats is fair, PRO School poor."

We've had favorable comment from other readers on the floats story but frankly don't expect kudos for such articles as "PRO School." The activities of the Air Forces in peacetime are largely administrative and organizational—certainly not as exciting as the first-hand account of the Regensburg raid. But we feel that such activities should be covered to some extent, if only for the record. Further, we believe that adequate public relations for the

Air Forces is most essential, particularly at this time.

"What Price Air Power—by William S. Friedman. Does he prophesy a World War III? 'This is how World War III may start.' Poor policy!"

Please note that the writer says "may start." Whether it does or not is a matter for the statesmen to decide. Meanwhile it is the responsibility of such well-informed individuals as AFA members to recognize that traditional air strategy may not be adequate in the face of an emergency which no one wants any more than anyone wanted World Wars I and II. The fact remains that they did happen and in neither instance was the U. S. prepared to fight in the air.

"'Bristol's Flying Freighter'—poor."

We feel that it is not sufficient to treat only the domestic aeronautical developments and so intend to report on all new aircraft of interest, regardless of the country of origin.

As to your remarks on advertising, *AIR FORCE* is no longer supported by the U. S. Government, and so must follow general publication procedure. It will be *AIR FORCE's* policy, however, to publish not less than 50 per cent more editorial pages than advertising. In other words, the more advertising we carry the more editorial pages we'll be able to give *AIR FORCE* readers.

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AIR FORCE



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In This Issue

The Cover This Month

Hans Groenhoff shot this Beech Bonanza, exciting four-place Vee-tailed transport that was reviewed in last month's "Strictly Personal" department. There seems to be a lot of thinking along the butterfly-tail line since Beech introduced it experimentally on an AT-10. Many of the designers of future military airplanes are using the idea, which offers the pilot the characteristics of a two-control airplane except when three are needed, as in cross-wind landings and take-offs (see "Doodles for Destruction," *AIR FORCE* September, 1946). This empennage system was planned originally for the Bristol 167, later built as the Brabazon, which is described in the article "Bigger and Better" on page 14.

Air Line to Anywhere

The author, J. Paul Andrews, has contributed his last article as a simon-pure aviation reporter. Formerly executive editor of *AIR FORCE* and TWA prize-winner who was informally labeled "the most realistic observer in aviation writing," Paul has taken over as director of public relations for Chicago and Southern Air Lines.

On the Air Show

The post of executive editor has been filled by the former Public Relations Officer of the MAAF, Lt. Col. Ned Root, whose initial by-line contribution is "Out of the Blue," a study of the reasons for and significance of the first postwar National Aircraft Show to be held in Cleveland in November.

Ned started in the writing business as a Los Angeles newspaperman. He started in the Army as a buck private in 1942 and graduated OCS with class 43-B in Miami. He became PRO for the Training Command under Lt. Gen. Barton K. Yount, finally went overseas to the Mediterranean area in February, 1945. His last official job was in Washington with the War Department Bureau of Public Relations.

Double or Nothing

The story of M. Delanne's double monoplane which leads off the Air Tech Section is the product of "Blimp" Friedman, the department's wheelhorse. The interesting thing about it is not the author but the source. Maurice Henri Delanne was introduced to the staff by Col. Anthony Harris, Lafayette Squadron pursuit pilot of World War I, who also acted as interpreter, since M. Delanne speaks very little English and Blimp Friedman *ne parle pas français*. When Col. Harris was not available, assistant editor Janet Lahey tried to fill in with her best sophomore Gallic, aided frequently by "The International Dictionary of Aeronautical Terms in Five Languages." Occasionally pilot-designer Delanne's discussions got pretty technical, and the pages would really fly. The payoff was a typed set of explanations of the aerodynamics of double monoplanes (in French) which Miss Lahey inherited. "Do you understand the French?" we asked. We got a look that would have welded steel plates. "This?" she answered—"this I can't understand even in English!"



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Photography by Morton B. Kelman

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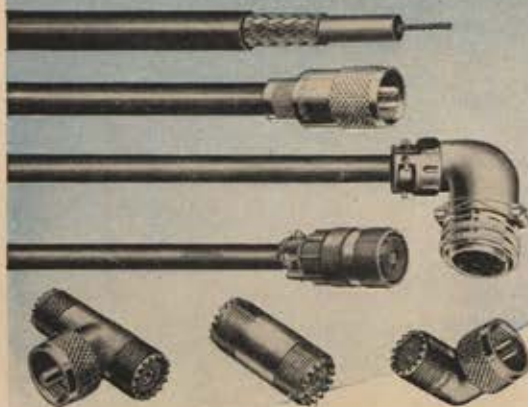
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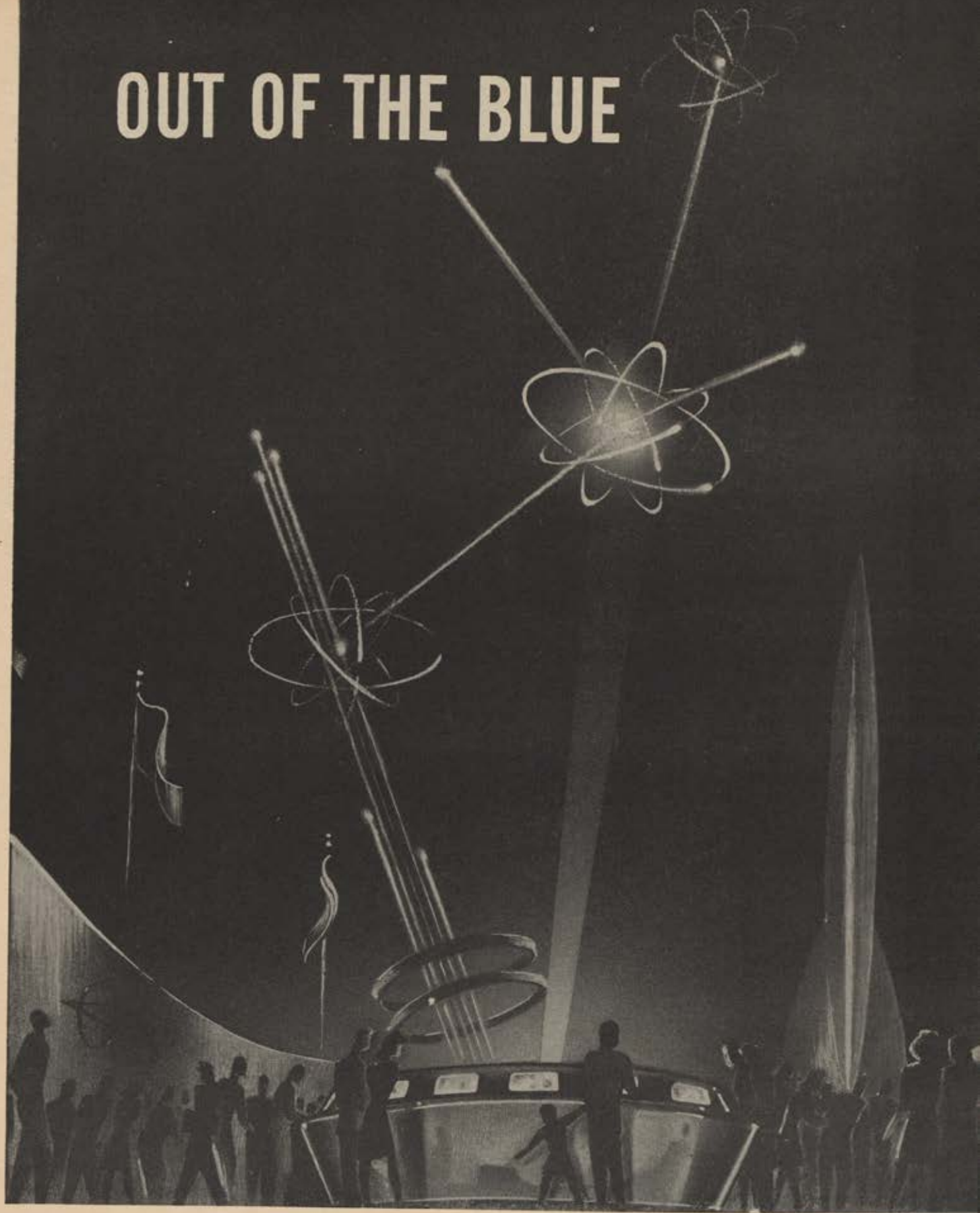


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OUT OF THE BLUE



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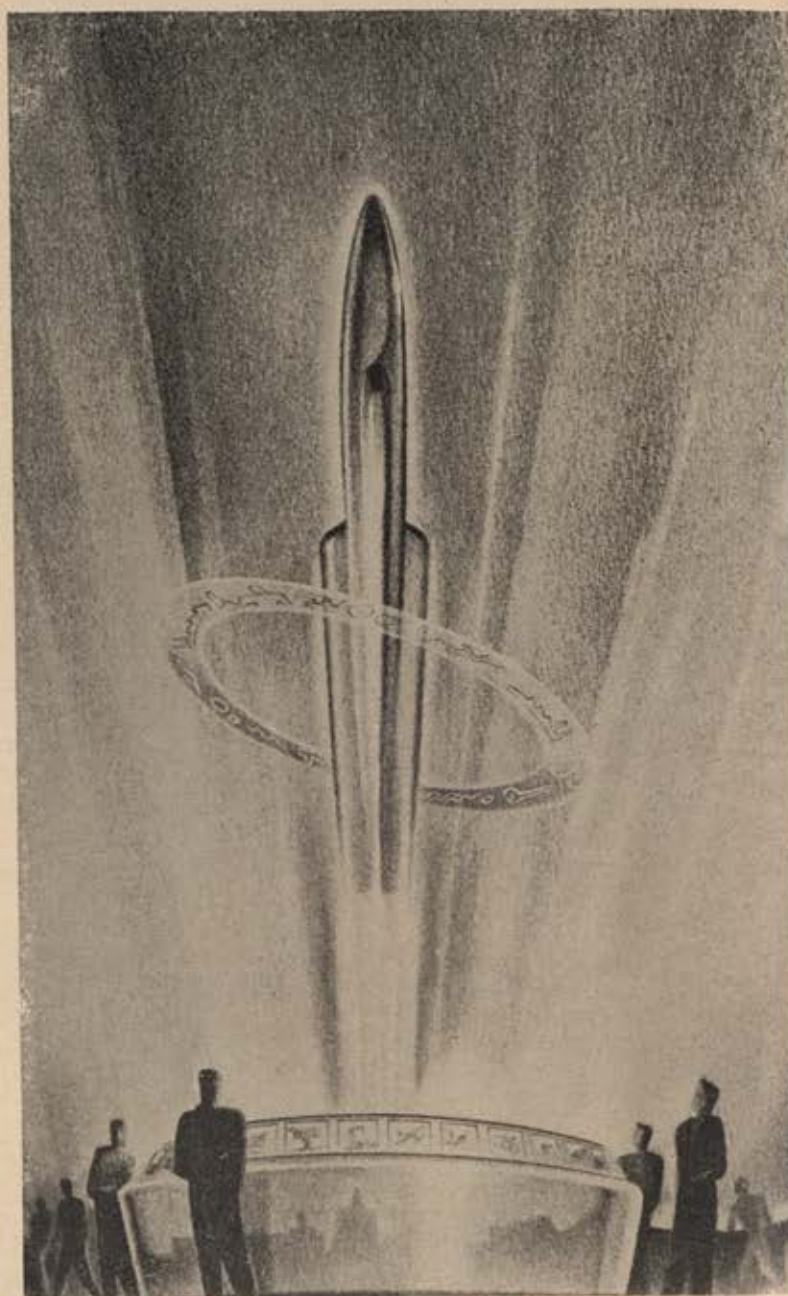
OUT OF THE BLUE

BY NED ROOT

PRIOR to the entry of the U.S. into World War II, air enthusiasts were more energetic in character than they were large in number. It was Pearl Harbor that turned the eyes of a nation skyward. Unfortunately however, too few of those eyes glimpsed more than a hazy picture of what aviation really is. The resulting astigmatism is understandable.

During the war, the means by which they could measure the girth and feel the substance of aviation were limited and artificial. Appraisal of the industry by its technological advances was impossible due to restrictions imposed for reasons of security. Appraisal based on soaring production records led to false conclusions because the war had made a munitions business out of the aircraft industry. The production of huge numbers of airplanes was a flattering gauge when used in figuring our capacity to manufacture implements of war, but it was of little or no value in determining the progress of aviation. There was no ratio between the accelerated output of warplanes and the growth of air enterprises.

About the only way John Q. could get next to what was going on upstairs was through headlines from the fighting fronts. And unfortunately, the picture he got this way brought the inadequacies of the Army's public relations system into sharper focus than it did the story of air power. For four years his growing interest was satiated with ill-advised yarns about one-thousand plane raids, and the dropping of five thousand tons of bombs. Reaching for any yardstick, he learned to measure the progress of aviation by the interval of time before there was a two-thousand plane raid in which ten thousand tons of bombs were loosed. In a maze of phrases like "the greatest aerial armada," "huge clouds of fighters," and "the largest weight of bombs," he found it impossible to keep in mind that aviation was an ordinary industry whose physical properties were as tangible as those of the automotive business—that its utility could be measured by performance records as well as by a seventy-five cent adjective. All his efforts to clarify his thinking on the matter seemed to be rewarded with only such information as added to his confusion. By war's end he had few convictions, but in spite



The First National Aircraft Show will be divided into seven "theme" categories, each depicting a phase of aviation. Above, skybound rocket presages a new era in air travel.

Purpose of the show is to demonstrate in dramatic fashion the utility of the airplane. At left is the personal aircraft theme center where visitors will see land and sea planes come and go.

Articles from all corners of the earth will be flown to the International Bazaar (opposite page) every day, graphically demonstrating the distance-obliterating power of the airplane.

of this he probably reasoned that as soon as aviation settled down and took stock of itself it would be on its way to bigger and better things.

These are the things that were running through the minds of a number of people in responsible positions in the airlines, the Army, the Navy, and the aircraft industries when they got together recently and decided that the best way to dispel the fog was to schedule a series of expositions which would give the public a factual indication of the scope of our air operations. The first of these exhibits, known henceforth as the National Aircraft Shows, will be held in Cleveland November 15-24. It will be followed by one in Los Angeles next spring. Thereafter they will become a semiannual affair, with the locale shifting from city to city as facilities permit.

Here at last is a promise that aviation will be brought down to earth from its apparitional "wild blue yonder." If the Shows live up to advance expectations, they will afford the average man an opportunity to put his finger on an airplane—and say to himself, "This is it."

He will discover for himself that there is a surprising substance to aviation—that it is considerably less Buck Rogers-ish than he had imagined. He will take satisfaction in the realization that the airplane is home from the wars and is ready to serve him personally. He will come to know and understand what aviation is, and what to expect of it in the future.

Clyde Vandeburg, director of the Shows and former general manager of the Aircraft War Production Council, has an exceptionally well conceived plan for making the exhibit accomplish its objectives. First of all, there will be no stunts at Cleveland. Vandeburg feels that the business of picking up a silk handkerchief with a wingtip proved nothing more than the pilot's skill and that it contributed little to the understanding of aviation's utilitarian value. Second, he will enlist the aid of all exhibitors in the strategic program of selling aviation in general rather than the tactical job of selling airplanes or airline tickets. He wants to do the same sort of institutional job for aviation that the automotive industry did for the automobile after the first world war. He wants people to acquire an interest in aviation as a communal undertaking—to ask questions about getting an airport started in their own town, for example. He wants exhibitors to be as familiar with the answers as they are with their own products.

Vandeburg learned the value of audience participation in any exhibit when he was director of such shows as the California Pacific International Exposition at San Diego in 1935, the San Francisco World's Fair in 1939-40. As a result, there are going to be more cockpits to sit in, levers to pull, and dials to turn in Cleveland than there have been in any similar show in history. "If they can get their hands on it and make it work, they're sold," he says.

(Continued on page 62)



BIGGER AND BETTER

THE XB-36 is the first of a fleet of very heavy bombers which the AAF is accepting for problems of planet defense. The fuselage is 163 feet long, as compared with the B-29's 99 feet. The 15-man crew operates from two pressurized compartments. Power is provided by six 3000-hp Pratt & Whitney Wasp Majors, set in special nacelles in the trailing edge of the wing. The pusher arrangement serves to keep the contour of the super-efficient laminar flow wing as clean as possible. The only breaks are the six air ducts. Considering the speed with which taxi tests were completed, it may be assumed that no cooling trouble was experienced with the completely cowled air-cooled engines. Eyewitnesses state that the engines were run wide open on the ground for long periods without damage to the engines. While no official statements have been released on the XB-36, it is believed that many of its characteristics will be similar to the Consolidated Vultee 204-passenger transoceanic transport which was ordered by Pan-American World Airways late last year. The main difference appears to be in the fuselage design. The giant transport will carry 15,300 pounds of baggage and cargo in addition to passengers and crew, at a cruising speed of 342 mph. While the first craft delivered to Pan-American will probably be powered by fan-cooled Wasp Majors, gas turbines may become available for prop-jet.

Although the present XB-36 has single-tired main wheels on its giant tricycle, production models will probably use some form of multi-wheel arrangement to distribute the load, making more airports available to the craft. At present there are only three in the entire United States which can accommodate the monster.

In England the giant Bristol Brabazon transport is taking shape. It will have the same span as the B-36, but the over-all length will be 177 feet. Gross weight is estimated at 285,000 pounds. While the Brabazon's all-metal airframe appears fairly conventional, the power plant arrangements are a distinct change from the usual British

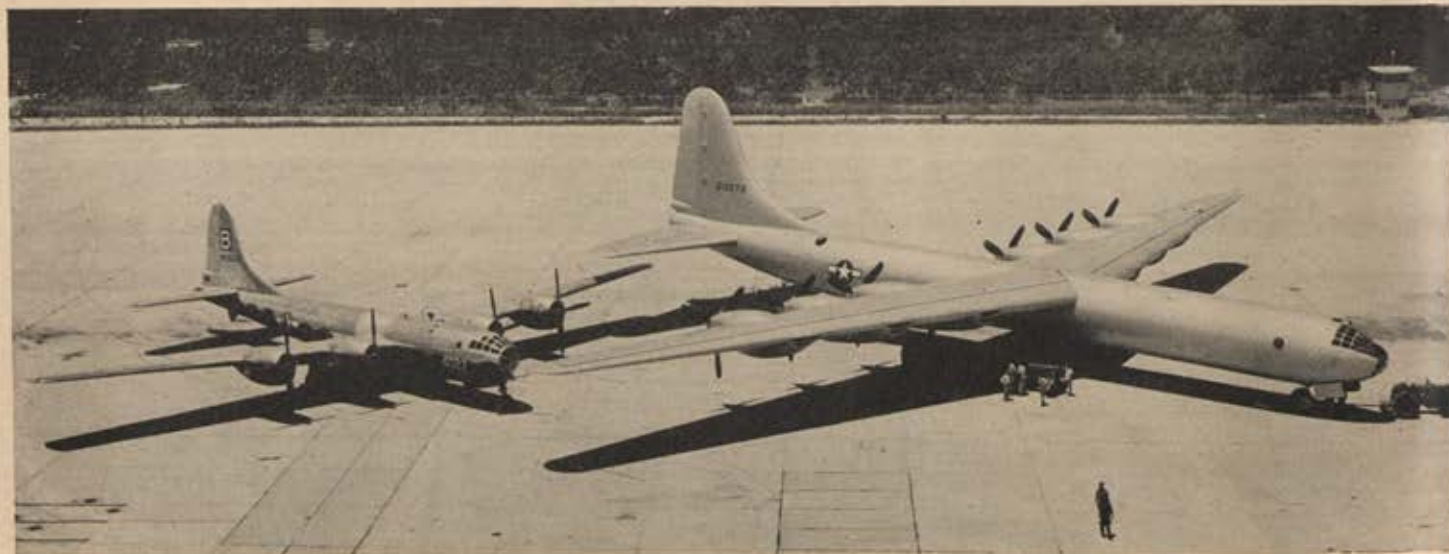
design. The aircraft will be powered by four units consisting of two Bristol Centaurus 2500-hp 18-cylinder sleeve-valve engines each. These two units are set inside the wing in front of the main spar, completely buried inside. They are placed at an angle, facing each other, feed their power by means of a shaft into a gear box which moves a six-bladed contra-rotating propeller. The same gear box supplies 250 hp each to drive generators, cabin superchargers, and other accessories.

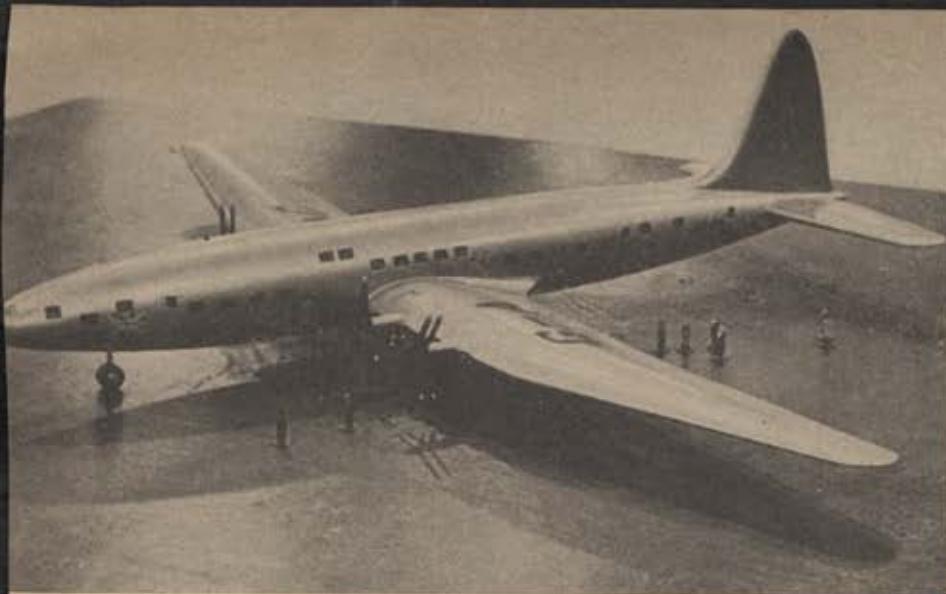
Meanwhile at this writing the master of them all approaches test-conditions at its graving dock at Terminal Island, Long Beach, California. The Hughes H-4, largest airplane ever attempted in both size and weight, was built originally to haul a 60-ton tank. It will weigh over 400,000 pounds, which is considered the breaking point in efficiency for an airborne vehicle. The Hughes giant is unique in many respects. It spans 320 feet, 20 feet longer than a regulation football field. Its hull is 220 feet long, 30 feet high, 25 feet wide. Power will be provided by eight P & W Wasp Major engines rated at 3000 hp swinging four-bladed reversible props, 17' 2" in diameter.

The H-4 will carry some 42 tons of fuel in 14 thousand-gallon tanks, will fly at about 220 mph. Average take-off is estimated at a little over a mile. The airframe is built chiefly of birch, because aircraft spruce was as difficult to obtain as metals at the time negotiations started. Spruce, maple, even balsa, however, were used where required.

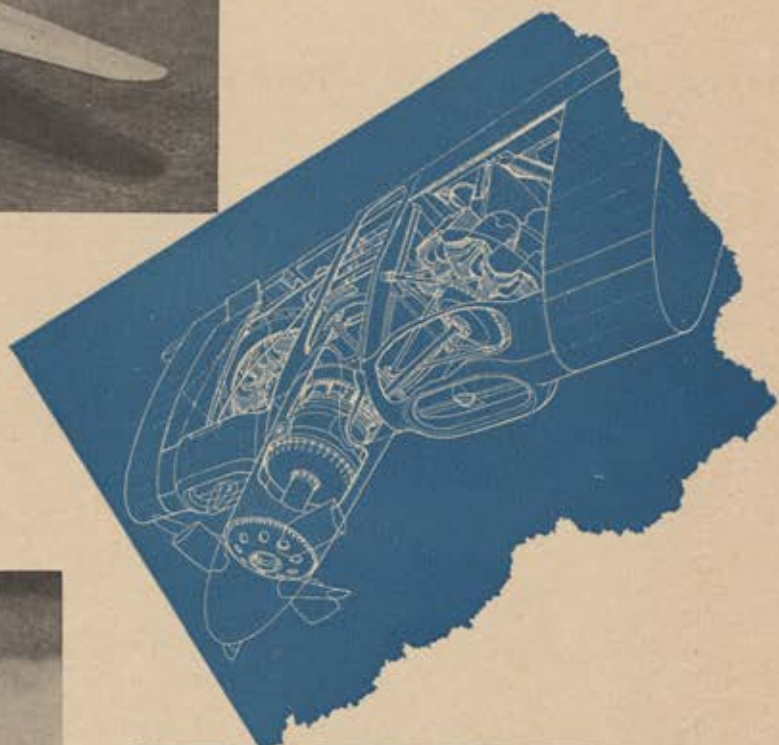
The introduction of such implements as gas turbines, ram-jet auxiliary power, flying wings, and super-light alloys points to efficient aircraft in the giant field. As far back as 1922 Igor Sikorsky proved that airplanes grew more efficient as their size increased because their size offered physical room for the incorporation of weight-saving structures. Of course, with aircraft as with other vehicles, there is a point where the law of diminishing returns catches up. Where it is can only be determined by building and watching results. We may be getting close.

Convair's 230-foot XB-36 dwarfs the battle-tested B-29. Pusher props were used to preserve the efficiency of the giant laminar-flow wing.

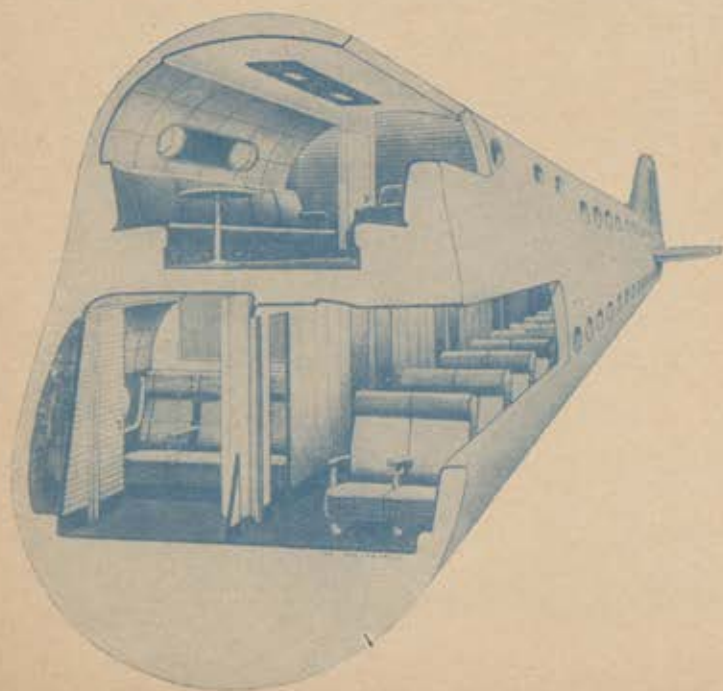




Britain's bid for transport supremacy, the 110-ton Bristol Brabazon, will be completed shortly. Below, diagram of unitwin power plant that couples two Centaurus engines to one contraprop.



Transport version of the XB-36, ordered by Pan-American Airways, will carry 204 passengers to Europe in its double-decked fuselage. The transport's fuselage will be 182 feet, 19 feet longer than the bombers. Below, right, final assembly on Hughes, eight-engined H-4 flying boat, the largest flying machine to date, 320 feet in span, weighing over 400,000 lbs.



Martin 303



Circular lounges, jet exhausts and reversible props feature the latest in high-speed supercharged mid-distance transports

WAR surplus aircraft are not clogging up the market as they did in 1919. On the contrary they are providing an operations bridge to span the gap between current needs and future designs. Among the best demonstrations of this trend is Northwest Airlines recent announcement of the purchase of a fleet of 40 new Martin 303 thirty-eight place transports. The new Martin twin is considered by many among the best medium-transport produced to date.

The 303 differs from the immediate postwar type, the 202, chiefly in the use of cabin supercharging, a new seating arrangement and altered power plant. Both are considered logical successors to the veteran DC-3.

The new luxury liner is to have a wingspan of 89 feet 4 inches, and an over-all length of 71 feet 4 inches. Gross weight for take-off will be 36,750 lbs., 12,000 lbs. of which will be useful load. Operational fuel capacity will be 750 gallons.

The 303 will be powered by two 18-cylinder 2,400-hp Pratt & Whitney engines. Like many of the late-design bombers and fighters, the engine will utilize the exhaust and cooling air through a Meredith-effect jet system to provide additional thrust. This will give the new liner a cruising speed of 300 mph. It is expected that the 303 will eventually be succeeded by the 404, a similar airframe powered by gas turbines.

Seating space for 38 passengers will be provided. The passenger cabin is 45 feet long and nine feet wide. Seats are arranged eight rows, four abreast, two on each side of the aisle, plus a six-seat semi-circular lounge in the rear. Large windows on each side of the lounge offer improved panoramic view for lounge passengers. The cabin is fully

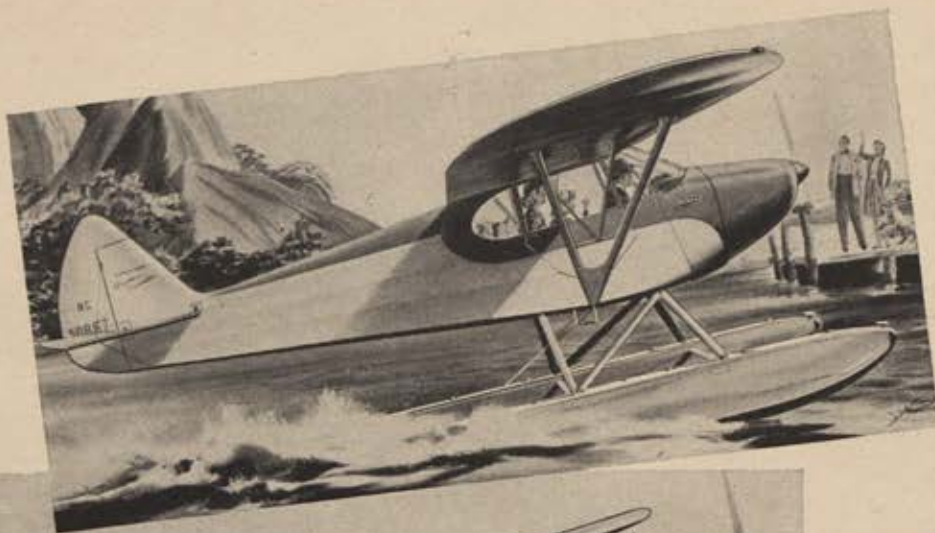
pressurized to maintain 6,000 foot air density. Passenger space is fully air conditioned, and heated by thermostatically controlled warm-wall radiant cabin heat. A buffet, situated in the forward part of the cabin, provides hot meals in flight.

The 303 is equipped with thermal de-icing, accomplished by piping exhaust heat to the tail surfaces and the wing's leading edge. The tricycle landing gear has dual wheels on the main trucks, and a steerable nose wheel. Reversible pitch props are provided for absolute braking power.

When the 303 fleet is delivered to Northwest, it will provide 1,520 more seats, releasing 4-engined equipment for long-range operation.

Martin's 303 incorporates such new ideas as pick-up baggage racks opposite door, integral loading ramp and twin-wheel main trucks.





PIPER CUB Sea Scouts

There are two Piper Cub Sea Scout models—the Super Cruiser and the Special equipped with floats. Regular wheel landing gear, also, shown on the two models illustrated below, comes with each Piper Cub Sea Scout and is conveniently interchangeable with the floats.

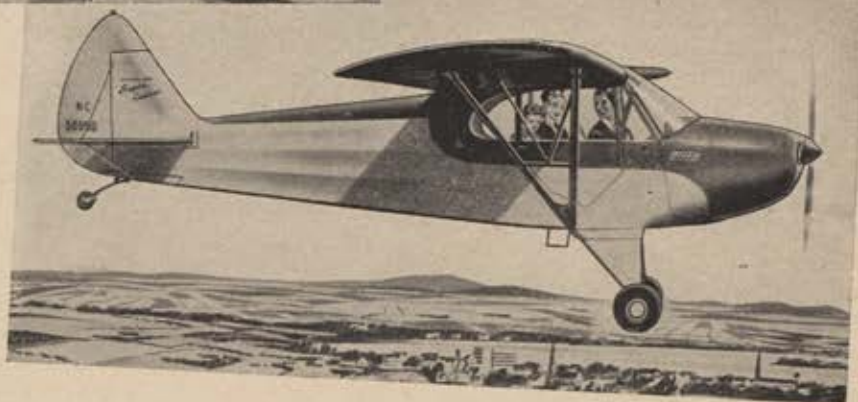


PIPER CUB Special

A two-passenger plane with dual controls. The 65-horsepower engine is equipped with a muffler. Standard equipment includes, also, stirrup step, one-piece Plexiglas windshield, compass, cabin heater, carburetor heater, dual hydraulic brakes and steerable tail wheel.

PIPER CUB Super Cruiser

A three-passenger, 100-horsepower plane with an electric starter and muffler. Has a 600-mile cruising range. Standard equipment includes, also, one-piece Plexiglas windshield, dual controls, parking brake, cabin heater, dual hydraulic brakes and full-swivel tail wheel.



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SO many Piper Cubs have been sold . . . so many are filling the skies all over the world today . . . that most people now think of "Cub" as a synonym for any light personal plane. But *only Piper makes the Cub*, that good, safe plane!

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World War II and achieved fame for its service in combat. It's the *Piper Cub* that costs less than any other two-passenger plane you can buy today. It's the *Piper Cub* that *proved* its safety and economy by *billions* of miles of flying!

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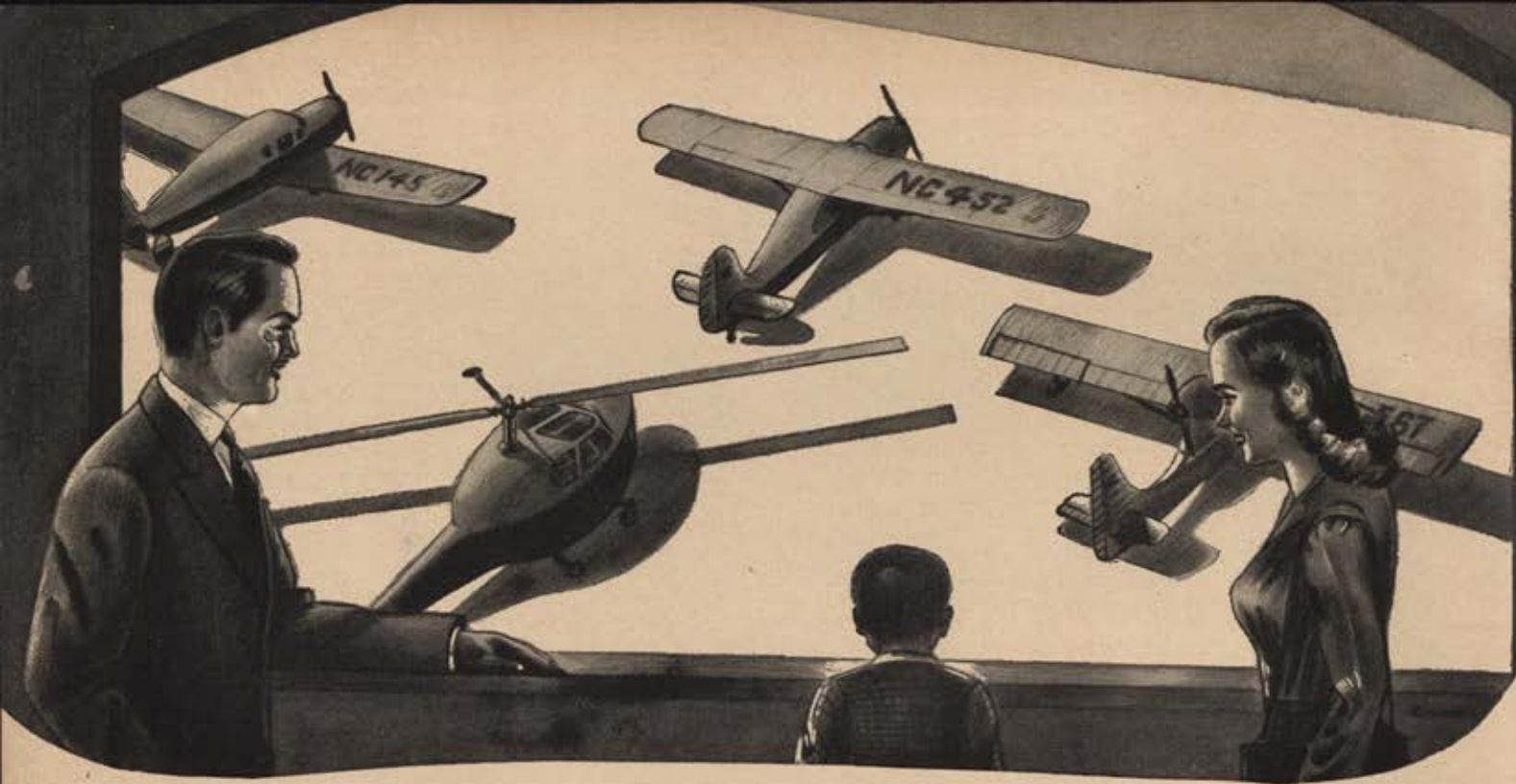
LOOK TO THE LEADER

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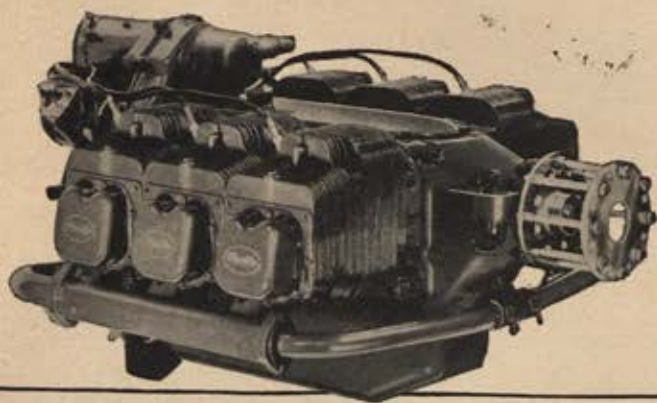
CAN AFFORD TO BUY AND FLY

OCTOBER, 1946

PIPER



You get a better plane when you get **POWER BY FRANKLIN**



Now	Stinson Voyager 150.....	Franklin "335"
"POWERED	Bellanca Crusair.....	Franklin "335"
BY	Republic Seabee.....	Franklin "500"
FRANKLIN"	Bell Helicopter.....	Franklin "335" —Vertical

Do you want 2-control or 3-control? Tricycle or conventional landing gear? Two place or 4 place? High or low wing? Land plane or amphibian?

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Franklin engines are backed by more air-cooled engine experience—46 years of it—than any other make. Franklin gives you an unsurpassed record of dependability, with economy of operation and maintenance. Franklin engines have long been recognized as quietest and smoothest in their horsepower range. Franklin offers such outstanding features as all-aluminum cylinders, steel timing gears, special heavy-duty crankshafts, and big-engine type carburetors with built-in altitude control, accelerator pump and idle cut-off. Every Franklin engine features electric starter and generator—and Franklin was the first light plane engine to offer them as standard equipment.

All these things add up to the fact that Franklin is a better engine—and a better engine means a better plane.

Choose a plane that boasts "Power by Franklin!"





anytime anywhere

AIRLINES

BY JOHN PAUL ANDREWS

Postwar Prospects for the AIR FORCE VETERAN

FROM 1941 UNTIL 1945, hot-shot pilots could earn upwards of \$100 every week by pushing a pea-shooter through the clouds for Uncle Sam's Army. But after V-J Day some of them wound up pushing baggage carts instead of airplanes.

Their occupational brethren, the technicians, earned up to \$250 a month during the war flying as crewmen on heavies and transports. But with war's end they too found it difficult to find a niche in commercial aviation commensurate with their abilities. The reason was simple: demobilization of Air Force vets moved at a speedier clip than reconversion and expansion of the peacetime air industry. Temporary unemployment—or employment beneath the individual's training level—was the result.

Happily, the situation is beginning to correct itself. More than one-third of the personnel now employed by the scheduled airlines are Air Force veterans, as are some 50 per cent of the employees at small airports. The business loosely described as "nonscheduled operations," however, seems to be practically an Air Force monopoly, with a veteran personnel of nearly 90 per cent. The veteran career possibilities in this field are especially bright.

That charter operators, who serve the hinterlands ignored by scheduled airlines, constitute an unknown quan-

tity is understandable, though not excusable in the light of their importance. Lacking a central organization until the Institute of Air Transportation raised its hopeful head some months ago, the nonscheduled operators have carried passengers anywhere, at any time, in the best traditions of rugged individualism. It is interesting to note that only three hundred charter companies boast permanent mailing addresses, although more than a thousand are known to exist. Moreover, the charter operators could never be located through government records because only the scheduled lines are required to register their aircraft and personnel with the Civil Aeronautics Administration. Unorganized, unregulated, and generally unknown outside of their home regions, they have carried on in the manner of tramp steamers on the world's sea lanes. Their variety of equipment serves only to amplify this analogy of operation.

Apparently, any airplane capable of carrying one or more passengers can qualify as a charter plane. At the moment, twenty-five different plane types are serving two hundred companies which use small planes exclusively. The Piper cub, nominally a sport plane or trainer, is used by more than forty charter operators. Similar low-horsepower types built by Aeronca, Commonwealth, In-

For single passengers and smaller payloads, the Rearwin Cloudster is adequate for nonscheduled operators. Payload on 450 hp spells profit with use of Fairchild 71, on wheels, skis or floats.



AIRLINES



Republic's Seabee has excellent nonscheduled possibilities in coastal areas, while the Piper Cub on floats is an old charter bet for sportsmen. Lockheed's 18 operates on fast service runs.

terstate, Luscombe, Porterfield and Taylorcraft have won acceptance with a total of fifty operators.

With greater payload, the products of Beech, Cessna, Fairchild, Grumman, Howard, Lockheed, Ryan, Spartan, Stinson and Waco have found even wider favor. Best available surveys show 260 of the latter types in service with 186 operators. Averaging four planes apiece, the 300 known charter operators own more than a thousand small airplanes which range in size from the Culver Dart to the Lockheed Lodestar. And the list of planes and plane types continues to grow as production schedules on light planes are accelerated. During the sixty days ending April 10th, 155 new charter operators sought information from the New York regional office of the Civil Aeronautics Administration. Of these, 28 planned service with Republic Seabees, 81 sought approval for other single-engine types, 32 were standardizing on Cessna UC-78s, and 14 had acquired the Noorduyin Norseman for charter operations. Some believe that a manufacturer—any manufacturer—who develops a four-place all-metal landplane priced at \$4,000 can corner the whole charter market without a struggle.

Operationally, the charter services are no less varied

Popular before the war, Beechcraft 17s are still charter money-makers, as are some of the former trainers like Fairchild's PT-19.





Twenty established operators use Taylorcraft side-by-sides for short-range single passenger charter service as well as training.



Interstate's rangy 65-hp Cadet is popular for charter use on the West Coast. Many have special arrangements for aerial photography.

than the equipment in current use. In Arkansas, Central Flying Service doubles between straight passenger work and crop-dusting. Out west, Carmel Valley Air Service of California limits charter service to a 200-mile radius suited to Fairchild PT-19 conversions. At near-by Glendale, Continental Flight Charter carries both passengers and cargo in the venerable Lockheed Orion while another Glendale operator, Western Continental Air Lines, carries "aerial house parties" to dude ranches and hunting lodges in twin-engine Cessnas and Grumman Widgeons. In the midwest, Ong Airlines of Kansas City ranks with the best organized charter companies in the country. Here, charter and ambulance work produce most of the revenues within a two-hour radius of the home base. And Lehigh Aircraft of Pennsylvania fills in the gaps between passenger charter flights with sign towing.

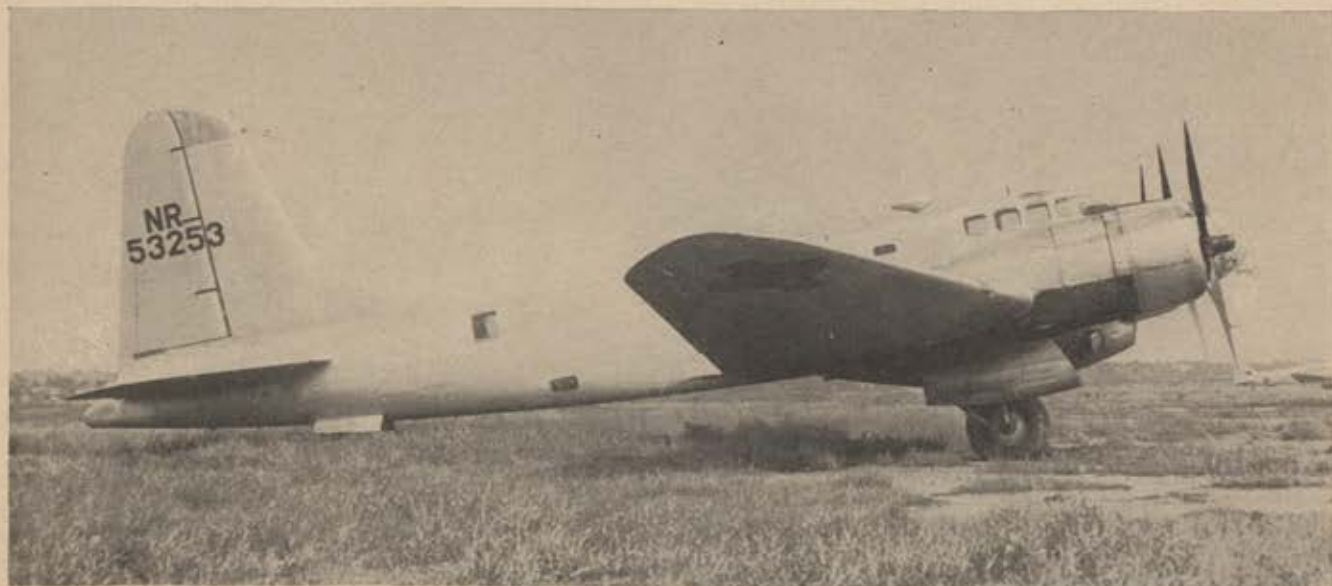
Neither the largest nor the smallest of the aerial taxi companies, Ong Aircraft Corporation typifies the best of the charter services now based in forty different states. In the first place, Ong uses a variety of planes ranging from the Stinson Voyager to the Cessna UC-78. Both of these planes rank with the most popular types for non-scheduled flying. Similarly, the Ong rates of as little as

15¢ to as much as 80¢ per mile cover the range of passenger fares general in the charter field. In all cases, actual airplane miles determine the total charge to passengers, with round-trip calculations mandatory whether or not the passenger wants one-way accommodation. When a ship remains away from base overnight, Ong covers pilot and plane expenses with a lay-over charge of twenty-five dollars.

Operationally, the Ong setup is far above average in quality and scope. All pilots hold instrument ratings and all ships carry complete instrumentation and radio equipment. Nocturnal operations, over lighted airways, are conducted only with twin-engine planes. That elaborate radio facilities can pay off in charter patronage is apparent in a study of Ong passenger records. Over a period of years, the demand for charter service has been heaviest during periods when inclement weather grounds the airlines or when severe snowstorms make highways impassable and rail travel uncertain. Paradoxically, the stagnant or low-pressure areas which handcuff the large airlines give small airlines their biggest patronage. Ong, for example, has completed more than 90 per cent of its flights.

In some quarters, all charter operations have been char-

Roscoe Turner is one of the few operators to convert a bomber to charter use. However, this B-23 bomber is closely related to the Douglas DC-3.



AIRLINES

anytime, anywhere

acterized as *tramp airlines*. The Ong operation belies the derogatory inferences contained in this appellation. Using a special charter flight report form, printed on heavy index cardboard, the Kansas City company maintains a running record on every individual passenger flight. Clearly indicating take-off weather conditions and loading, operational factors en route, and the names and weights of all passengers, this record has won high approval from insurance companies and the Civil Aeronautics Administration. More important, it gives the Ong accounting department a full story on costs, revenues and profits.

It is this efficient cost accounting which has given Ong a tariff schedule welcomed by patrons from all walks of life. But the patronage is largely stimulated by the company's careful attention to operational details. Ground transportation is provided at the airport of origin and also at the airport of destination.

On flights en route during normal meal hours, hearty lunches prepared before take-off are served by the pilot, while hot and cold beverages are carried on all flights. And every take-off is timed to give passengers the convenience of airline or railroad connections. With a perfect safety record, an attention to passenger comfort patterned after regular airline procedures, and a working arrangement with other charter operators in nine states, Ong had found a small charter patronage in the Kansas City area and has built that modest beginning into one of the largest nonscheduled services in the United States. Sooner or later, other charter operators will be duplicating the service of the Ong Aircraft Corporation at numerous points all over the country.

With a variety of plane types, a diversity of operational problems, it would be impossible to determine basic rates for the three hundred operators in forty states. One point is certain, however. Airline officials who see three-penny passenger fares as the principal attraction for new customers may be way off the beam. Charging rates up to twenty times that figure, charter operators are winning spectacular patronage with low-speed, low-comfort planes.

That charter operations have a definite place in the domestic travel picture is obvious in a study of our national travel facilities. There are, today, more than 59,000 passenger stations on the 737 operating railroads. In sharp contrast, only 410 certificated airline stops were getting any real service as recently as April of this year. So the anywhere, anytime air services are simply filling vast areas which want air speed and comfort but which are not currently serviced by the scheduled airlines. Flexibility is the keynote of a second charter service advantage. Flying from several thousand small airports the charter services offer a wealth of personal service. Yet it is obvious that every desirable feature of charter air services has a dozen undesirable counterparts.

In the first place, charter service is expensive. For example, the airlines will carry a passenger from Minneapolis to New York and return for approximately \$90. Schaper Air Transport, a charter company based at Minneapolis, quotes \$165 as the lowest charter rate between the same points. Moreover, the airlines accept one-way patrons while the charter passenger usually must pay the

Like many Canadian charter operators, Gray Rocks Air Service uses Noordduyn Norsemen. Nearly 50 U.S. locals use Waco cabins, some on floats. On skis, floats or wheels, the Aeronca Chief makes money for 15 operators. Culver's Dart is popular in California.





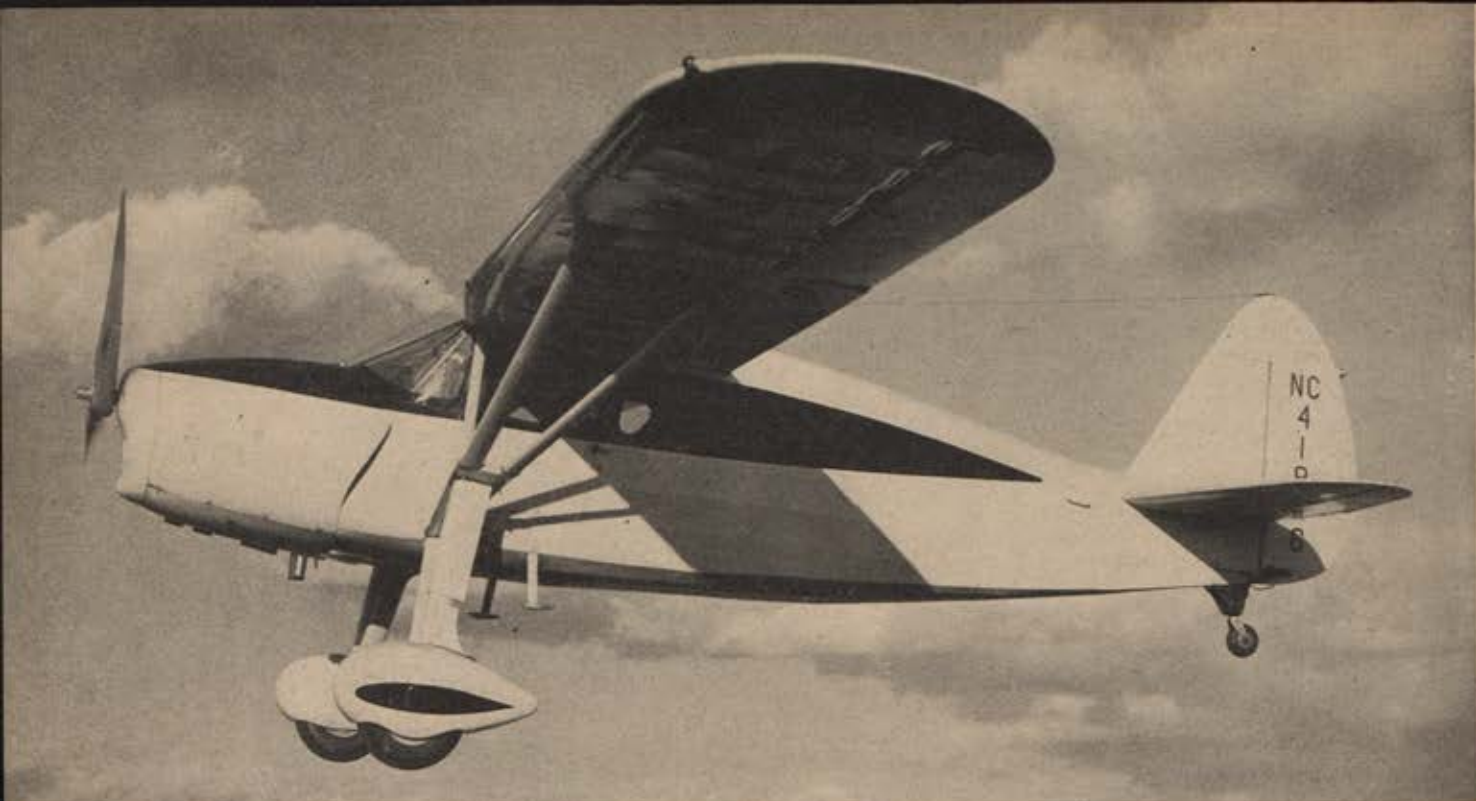
In the 3-place field, Piper's Supercruiser, Stinson's 105 and the all-metal Ryan SC-W-145 combine load with economy. All three are useful in small-field operation where fast take-offs are vital.

round-trip fare. The need for quick turnaround also adds layover charges of \$20 per day or more to the passenger's total tariff whenever the ship and pilot stay away from base for more than one business day.

Obviously, thousands of air travelers will accept charter accommodations regardless of cost. However, the money-eyed customer has always been the severest critic of travel accommodations on trains and airliners. It is this factor more than any other which now works against the charter operator. While depending upon luxury patronage, few charter operators offer anything resembling luxury service. On one recent charter flight from Miami to Washington two famous industrialists spent six hours in the air, only to land at Jacksonville—still a thousand miles from their destination. Another charter plane spent seven hours in an Illinois meadow during the course of a two-hour Chicago-St. Louis charter hop. In both cases, the charter operator steadfastly refused to refund unused portions of

All-metal aircraft have certain customer appeal, stemming chiefly from the material's military reputation. The Luscombe Silhouette and the Wasp-engined Spartan both have functions in charter operations.





Fairchild's F-24 carries four at 133 mph, making it a profitable charter craft. Grumman's Goose is a carriage-trade vehicle. Its kid brother, the Widgeon, recently went into commuter service, carrying summer residents from Long Island homes to Manhattan. Aeronca's tiny K still charters on floats in the Columbia River, while the veteran Lockheed Orion still rates as high-speed charter-type equipment.

the passengers' fares. With such ethical and operational failings general in the charter industry, customer apathy toward charter service is understandable. When these major service inadequacies are accented by bad ground facilities, dirty planes, and the uncertainty of schedule completion in ships limited to daylight flying under contact rules, it is easy to understand why fewer than fifty of the three hundred charter operators are making a profit in commercial aviation. Operating according to the best airline traditions, these fifty operators have little to fear in projected Civil Aeronautics Board control of non-scheduled air services.

It is this latter element which poses most of the ques-

(Continued on page 62)

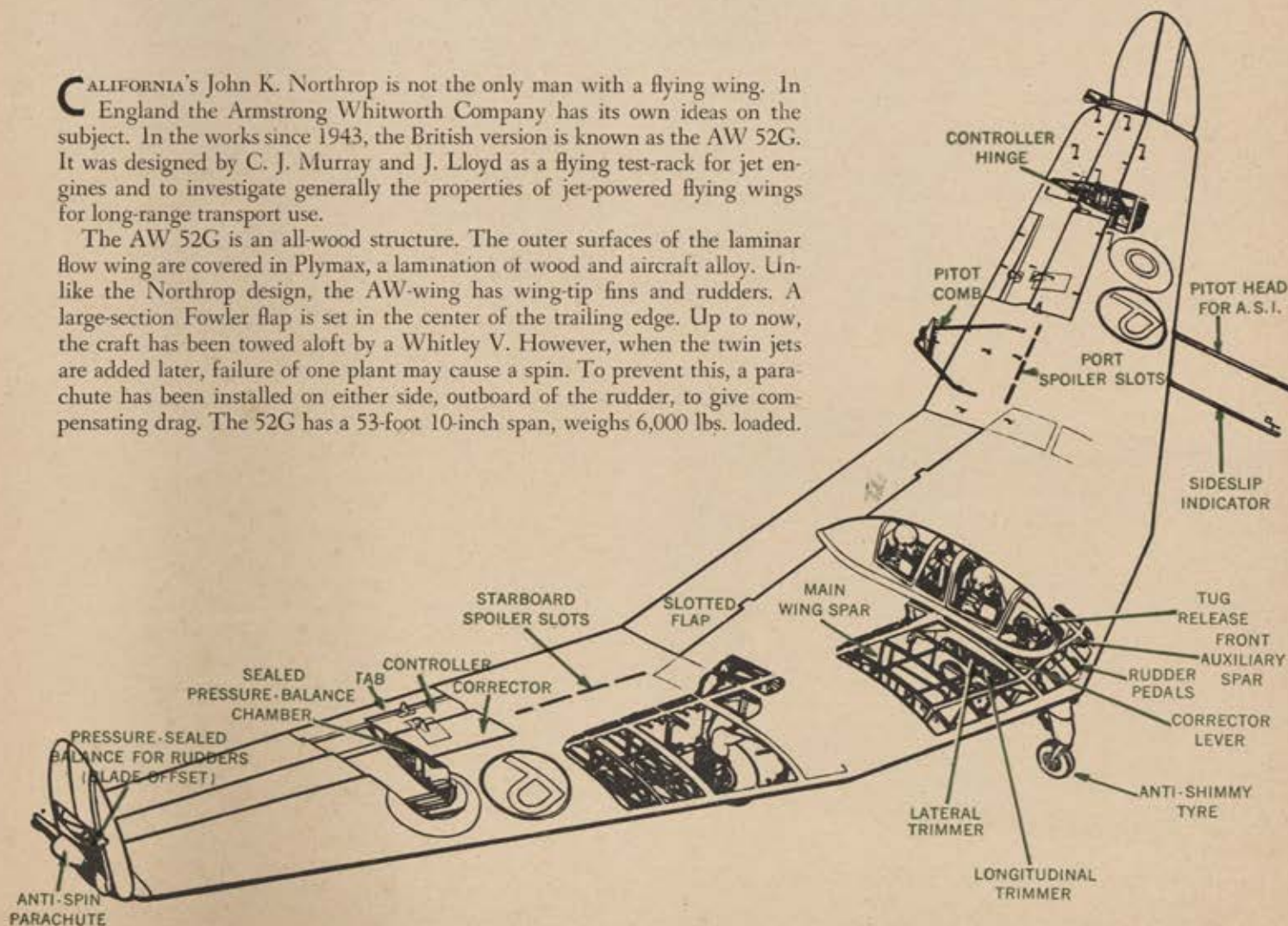


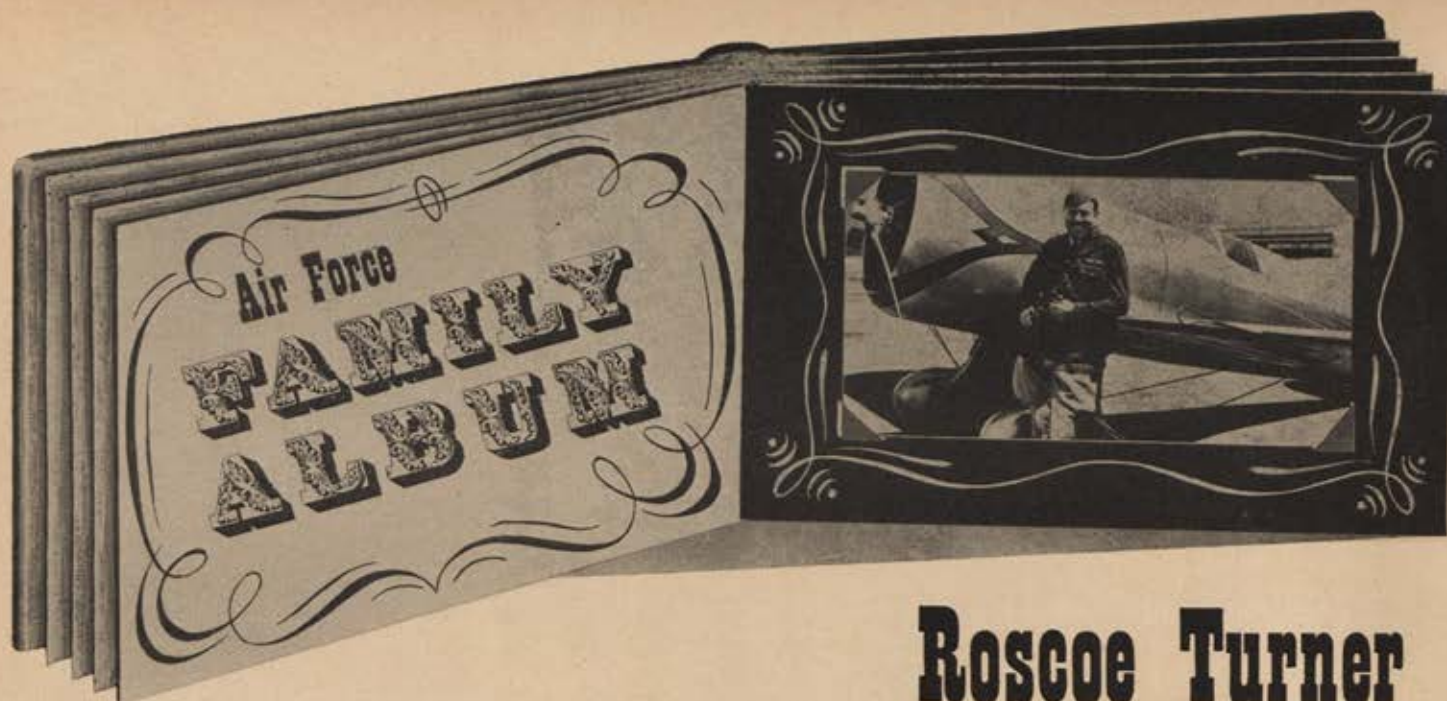
BRITAIN'S

Jet GLIDER

CALIFORNIA's John K. Northrop is not the only man with a flying wing. In England the Armstrong Whitworth Company has its own ideas on the subject. In the works since 1943, the British version is known as the AW 52G. It was designed by C. J. Murray and J. Lloyd as a flying test-rack for jet engines and to investigate generally the properties of jet-powered flying wings for long-range transport use.

The AW 52G is an all-wood structure. The outer surfaces of the laminar flow wing are covered in Plymax, a lamination of wood and aircraft alloy. Unlike the Northrop design, the AW-wing has wing-tip fins and rudders. A large-section Fowler flap is set in the center of the trailing edge. Up to now, the craft has been towed aloft by a Whitley V. However, when the twin jets are added later, failure of one plant may cause a spin. To prevent this, a parachute has been installed on either side, outboard of the rudder, to give compensating drag. The 52G has a 53-foot 10-inch span, weighs 6,000 lbs. loaded.





Roscoe Turner

By Harvey Hayden

WHEN fixed base operators, flying school owners and other "little fellows" in aviation need someone to beard big-time interests in their legislative lairs, one fellow usually shows up to front for them. He used to be one of the world's hottest racing pilots. He once walked wings on a barnstorming Jenny. His trophy collection would fill a small museum. He used to wear a custom-built uniform that would make the classic "revolutionist general" pale by comparison. He still sports a waxed, high-dihedral mustache, as the last vestige of a splendor that is history. There is only one like him and his name is Roscoe Turner.

Turner was born on a farm in Corinth, Mississippi in 1895. His father was a farmer, and he wanted his son to be a farmer too. However, there were motorcycles in Mississippi, and they went faster than the fastest horse in town.

So, papa notwithstanding, Turner got his motorbike. The next step was inevitable—auto repairman and mechanic, and automobile driver.

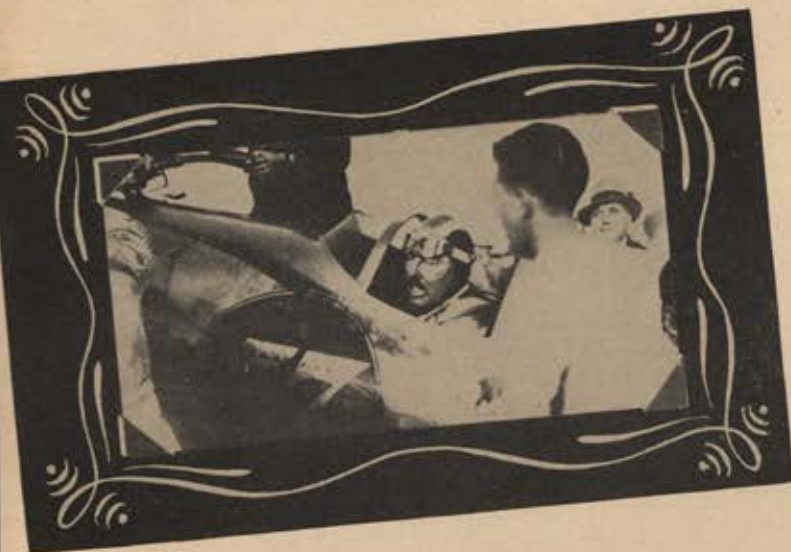
Turner was 22 when the first World War began. Immediately, Roscoe volunteered as an ambulance driver, but the business of driving the proverbial "meat wagon" looked dull. Indian motorcycles and Packard cars had given him a taste for speed and the answer was flying. It took three months of constant effort to get into the Air Service, which was still a Signal Corps function in 1917.

Even this proved a trap. Instead of getting sent to Kelly Field, Texas to fly a Jenny, Turner was shipped to the balloon school at Omaha, Nebraska. It took a tall amount of talking to get out of that one. There are those who say that Roscoe Turner learned to be a convincing arguer, trying to get himself transferred to heavier-than-air. Finally, he made Kelly Field, soloed, got his commission, and was sent to France, where he served as flying instructor at the Army school at Colombey-Les-Belles. He held this post for ten months, also doing duty with the 2d Army Headquarters and the 6th Corps.

In 1919, Turner found himself a civilian again. With some of his wartime buddies, he started barnstorming the country, first in a three-place Avro, later in Curtiss JN4Ds. It was the usual business, hopping passengers from pastures, walking wings, the exciting feast-and-famine life that seemed to lead nowhere.

In 1928, when it seems the public had grown to like flying, Turner bought the largest passenger plane in the U.S., a big, twin-engined Sikorsky. Too large for backlot barnstorming, it was used chiefly for advertising stunts for such companies as the United Cigar Stores, R. H. Macy's in New York, and other outfits whose press agents had enough imagination to see the possibilities for publicity in the big biplane.

There was money in big-plane operation. The public liked size and the flying goliath had real possibilities. But it was slow, and out on the West Coast a fellow named Jack Northrop had the Lockheed plant building his



In 1933, Turner took the Bendix and Shell dash with his Wedell-Williams, losing the Thompson on a technicality. Below, refueling at Cleveland during his 1934 Bendix transcontinental triumph.



Man at work, 1942. In Indianapolis Turner occasionally wore his famed blue blouse.



Man at work, 1920. Turner "suspended" from a Jenny's wing. The *Popular Science* caption on the picture termed the stunt "extremely perilous."



In 1935, Turner trailed Benny Howard in the Bendix race, and was leading the Thompson when his engine took fire. Above, Howard and Turner getting permanent Bendix trophies from Herbert Sharlock. Below, Turner shown with Gilmore, the parachute-equipped lion cub.

Mrs. Turner congratulates Roscoe after hanging up 1935 transcontinental mark.



Turner, Clyde Pangborn take delivery on their Boeing 247 for MacRobertson Race.



slick, full cantilever high-wing monoplane that was fast—plenty fast. That was for Turner. Howard Hughes, the young millionaire oil-man-aviation-enthusiast was trying his hand at producing an aviation movie called *Hell's Angels*. He needed something that would look like a German Gotha bomber, and Turner's Sikorsky was it.

So Roscoe Turner went to flying Lockheeds, and the speed era was on, not just for himself but for passengers as well. In 1929, Turner managed and operated the first real high-speed airline between Los Angeles and Reno. In his Lockheed Vega, that year, he broke the passenger-carrying transcontinental speed record. Time from New York to L.A. was 20 hours and 20 minutes.

1930 was another fast year. He established a new record North-South across the U.S. from Vancouver, B. C. to Agua Caliente, Mexico in 9 hours and 14 minutes. The same year, flying a Lockheed Air Express, he hung up a new New York to Los Angeles mark of 18 hours and 27 minutes.

In 1932, Turner was back in the headlines with a vengeance. He carried two passengers, movie producer Joe Schenck and star Lili Damita from Mexico City to Los Angeles in 11½ hours. During that year he acquired a sleek little Wedell-Williams racer. Possibly from lack of familiarity with the new ship, possibly from a series of bad breaks, Turner drew three third places that year: the Bendix and Thompson Trophy races, and the Shell Speed Dash. However, just to show what was in his little craft, Turner broke the New York—Los Angeles record again, this time taking it down to 12 hours and 35 minutes.

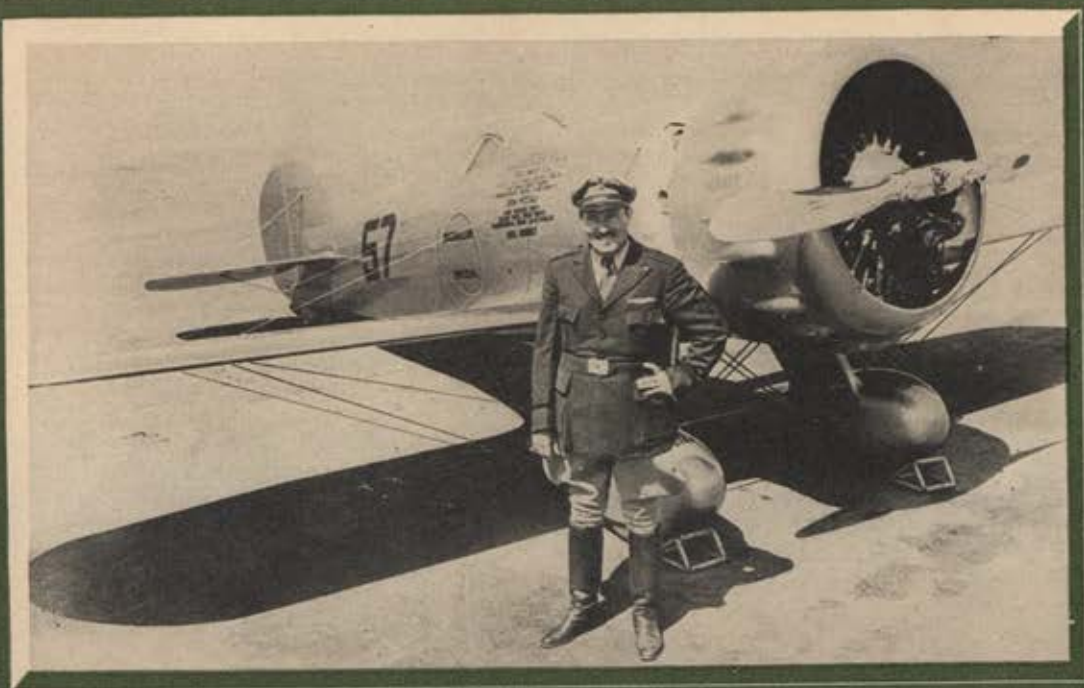
During this little plane's useful lifetime, it carried

three different types of Pratt & Whitney engines—the original Wasp Junior, the Wasp Senior and the Hornet engines. In 1933, the year Turner won the coveted Harmon Trophy for the top performance by an American pilot, he won the Bendix Trophy by hanging up a transcontinental record that stood for five years—New York to Los Angeles in 11 hours and 30 minutes. During the same set of National Air Races, he took first place at the Shell speed dash, and actually drew first place in the Thompson Trophy race, but was disqualified on a technicality. In September of that year, he lowered the L.A.—N. Y. time to 10 hours 5 minutes.

1934 was a star year. With the big Hornet in front of the W-W racer, he took first place in the Thompson Trophy race, second place in the Shell speed dash. Shortly thereafter he lowered his L. A. to N. Y. time to 10 hours and 2 minutes. But the big excitement was the MacRobertson race from London to Melbourne. Teamed with Clyde Pangborn, they were the only American crew to finish. Their plane was a former United Air Lines Boeing 247. They placed second in the speed division of the race.

The MacRobertson race was considered a jinx event by many. It heralded a rough spell for Turner too. In 1935, he was leading in the Thompson Trophy race, when his engine caught fire in the final lap. In 1936, an accident just before the Bendix race start barred him for that season. In 1937, during the Thompson Trophy race, he turned back to pick up a pylon he never actually missed. This dropped him back from lead to third place.

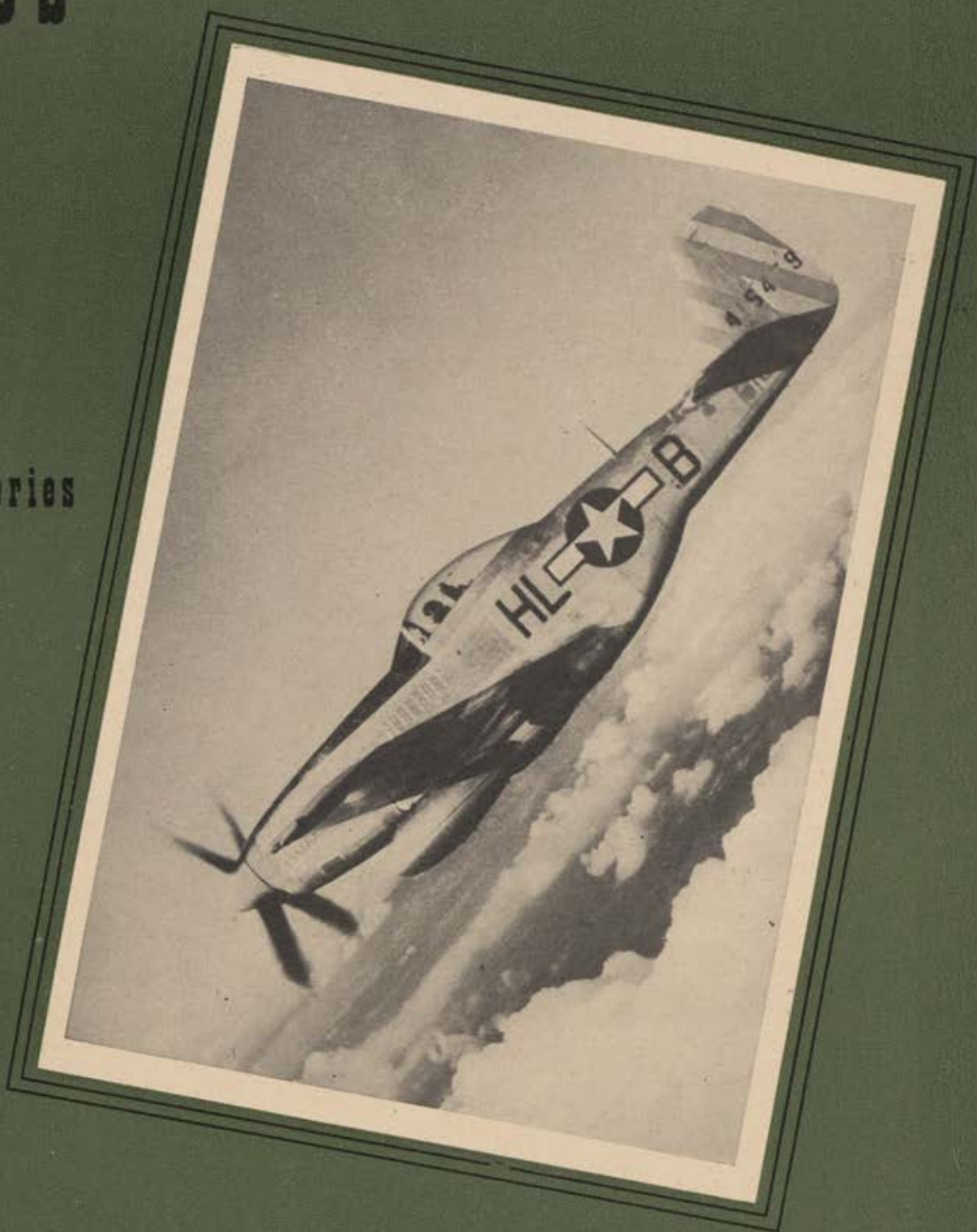
(Continued on page 66)



Turner led the last lap of 1935's Thompson race until the stepped-up engine in his Wedell-Williams took fire, forcing him out.

Great Planes of the War

First in a Series



North American P-51▶



Major George E. Preddy, who flew Mustangs in the ETO and Pacific.



Lt. C. L. Lukic, who destroyed five Nazi aircraft in a single mission.



Lt. Col. J. M. Blokeslee, who flew first Mustang escort over Berlin.



Maj. J. H. Howard, who tackled 30 Nazis over Berlin and downed six.

North American P-51

BY MARTIN CAIDIN

IT HAS BEEN SAID that superiority, whether in planes or pianos, is attained solely through craftsmanship and not by accident. Certainly North American's famous Mustang fighter would bear this out. Like a well-tuned concert Steinway, the P-51 is the distillation of the most skillful artisans. The aerodynamically clean airframe of the Mustang grew out of the combined aeronautical knowledge and experience of the Army Air Forces, North American's top-flight engineers plus the critical appraisal of Britain's Royal Air Force which long had been wedded to the Spitfire.

The Mustang's contemporaries, Allied and Axis alike, started before the war or were evolved through months of combat experience. The P-51, however, was a product of the moment. It was conceived and created in exactly 102 days. Only a week after the initial sketches appeared on drawing boards, a mockup had been built and work started on the complete 2,800 drawings which made up the first N.A. 73 Mustang design. Engineers laboring sixteen hours a day, seven days a week, permitted the first plane to roll out of its hangar in 100 days and fly twenty days later when the engine arrived.

Accelerated production of an unproved design demands even greater accuracy in aerodynamic and mathematical predictions than normal development. This is because the restricting time element does not permit trial and extensive flight testing. The Mustang case was emphasized by the fact that engineers were attempting to get minimum drag for maximum speed with available power. The sleek American fighter was tailored to British specifications with much higher range than existing Royal Air Force designs could achieve; this was to be done while retaining exceptional maneuverability. Incorporated within the Mustang was assured ease of maintenance in the field, and an airframe whose manufacture was speeded by simplification of structure. Not only did North American's engineers build this as yet revolutionary aircraft in 120 days, but they also produced a low-drag airfoil of laminar-flow type, and designed a fuselage that was mathematically perfect due to its second degree curves. They worked in, too, a cantilever beam engine support.

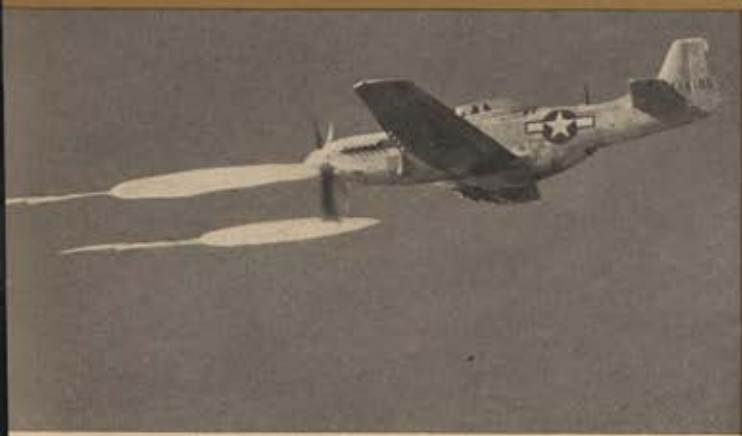
The Mustang I, low-medium altitude fighter, in its first combat forays was a reconnaissance aircraft limited to the prosaic duties of army tactical cooperation. But a few months later a formation of P-51s showed their tails to a squadron of prize British Spitfires during a Channel foray. When the 410 mph Mustangs followed this exploit by proving they were the only single engine aircraft capable of pushing inland against air opposition during the Dieppe Commando raids, their future was assured.



The P-51B, powered by a Packard-Merlin, carried 20mm cannon.



The TP-51 was two-place transitional trainer version of the P-51D.



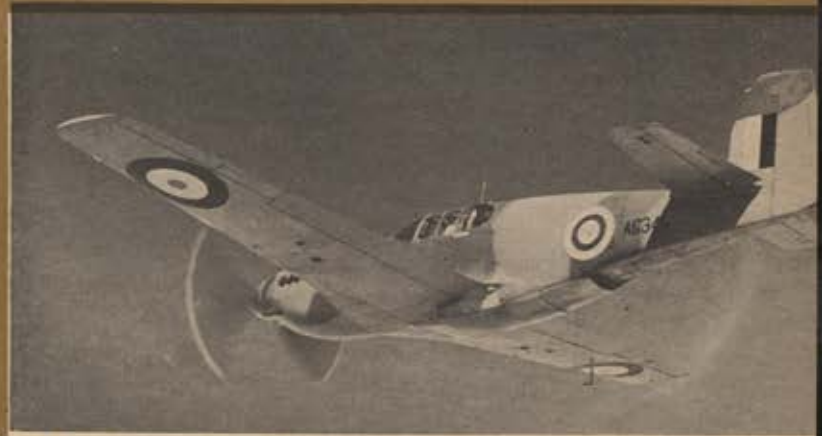
P-51D with dorsal fin firing rockets from craft's zero-rail system.



A-36 Invader, Mustang with dive-brakes for bombing, strafing.



Some P-51Ds were sent to the Chinese for use on interior patrol duty.



The Apache, original British close-support version of the P-51 fighter.



The Original Mustang carried 6 to 8 mixed .50 and .30 caliber guns.



XP-51, the Allison-powered prototype, flown for acceptance tests.



The P-51A was armed like the B, but was still powered by an Allison.

North American P-51

Brought War To Huns

May, 1942 was the first month of Mustang action. The Allison-powered fighter streaked across the deck of occupied Europe, disrupting power lines and communications, wrecking defense installations and emplacements, blasting airfields, destroying large numbers of enemy craft.

Early in its career USAAF attention had focused on the new fighter that was posting such a splendid record on the Western Front. In July, 1942 the first Mustangs were sent to England and to General Claire Chennault's forces in China. The 51's successes against German ground communications, ships, emplacements, planes and ordnance on Pantelleria and in invasion of Sicily brought into action the A-36 Invader, fighter-bomber version of the Mustang equipped with dive brakes and bomb racks. On June 6th, 1943, the first Invaders joined in extensive attacks upon Pantelleria ground targets.

Fitted with brakes to steady diving aim at controlled speed in near vertical dives, A-36A packed the combined firepower of six .50 caliber machine guns and two 500-pound bombs, sometimes doubling the total explosive carriage to one ton. By July 10th, a little more than one month after their combat debut, the fighter-bombers completed their 1,000th sortie. Most spectacular of all Invader achievements was the sinking of a 50,000-ton Italian

transport of the *Conte Di Savoia* class, accomplished by two aircraft scoring direct hits with four 500-pound bombs.

Although originally designed as a low-altitude fighter, the Mustang soon established new precedents in aerial warfare. Blazing speed with excellent controllability at low altitudes gave the Mustang pilots a decided advantage over enemy aircraft. Combat modifications altered various squadrons of Mustangs to the particular needs of a combat theater; P-51As swept across France, the European lowlands, and Asia firing explosive shells from four high velocity 20mm cannon.

As time progressed AAF engineers foresaw the Mustang's potential in high altitude and long-range operations. Extensive experimentation and redesign of the basic airframe with engine change to the Packard-built Rolls Royce Merlin of 1,520 hp transformed overnight the low-altitude machine into an all-round warplane.

While Mustangs raged across China, Burma and India in considerable strength, first attacking Hanoi and Haiphong in Indo-China on December 9th, 1943, their place in history was being made secure in the European theater. On February 10th, 1944 Mustang and other fighter pilots helped start the mass fighter destruction of the Luftwaffe by downing 86 German aircraft over Brunswick.

By April 5th the first mass-scale all-fighter sweeps at

high and low altitudes across Europe were reaching their pre-D-Day peak. P-51s carried out damaging forays against the Berlin and Munich areas and on May 5th RAF Mustang bombers accompanied by British fighters bombed and pierced the huge Pescara River dam in Italy. From every combat theater in the world imposing records of enemy aircraft and installations destroyed were reported.

Among Eighth Air Force combat groups, the Mustang fighter pilots of Don Blakeslee's famous 4th engaged in friendly but furious rivalry with the Thunderbolt fighter squadrons of Hubert Zemke's 56th. Here was a thrilling battle of the aces. Blakeslee's roster was a glittering one—Don Gentile, John T. Godfrey, Duane Beeson, James A. Goodson, Nicholas Megura, George Carpenter and Charles Anderson. Flying for Zemke were such legendary Nazi-killers as Francis Gabreski, Bob Johnson, Dave Schilling, Walter Mahurin, Gerald Johnson and Leroy Schreiber. Blakeslee's boys had started with Spitfires and later switched to Thunderbolts. Finally they were equipped with Mustangs and really went to town. Zemke's 56th, however, started with Thunderbolts and stuck with them. When the last shot was fired and the score was totalled both groups were about even, each having destroyed more than a thousand enemy aircraft.

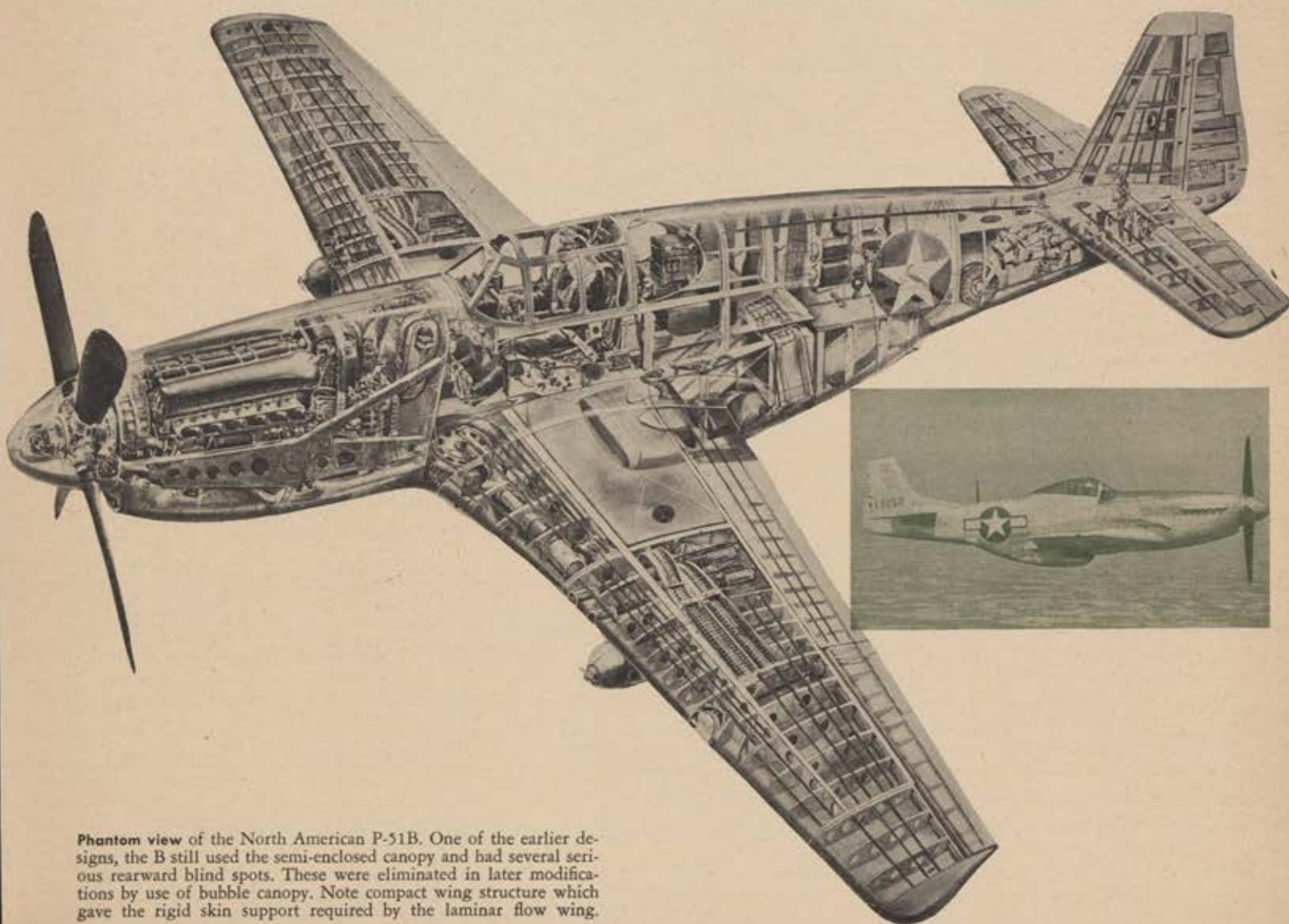
Flying from Allied bases to Russian airfields on June 2, 1944, the P-51s inaugurated the first trans-European

shuttle bombing escort. The fighters accompanied the heavies all the way as the latter dropped their bombs on Rumanian and Hungarian targets. On June 26, the return leg of the shuttle saw the Mustangs accompany the bombers from Russia to Italy.

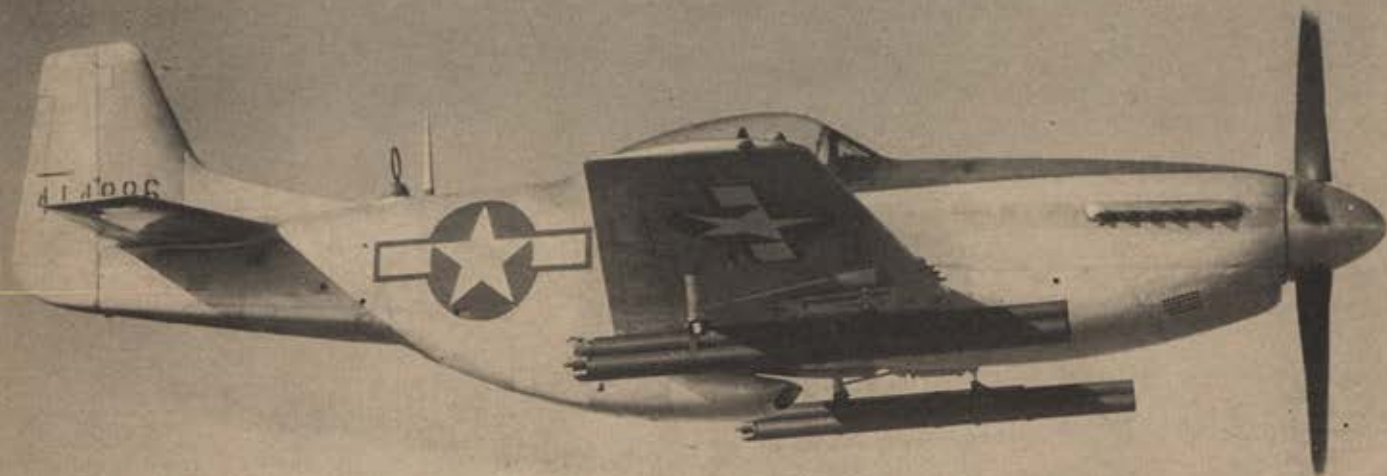
Completing a historic 7,000-mile bombing triangle across Holland, Germany, Poland, Russia, Czechoslovakia, Hungary, Yugoslavia, Italy and France without a single loss, U. S. Eighth Air Force Fortresses and Mustangs next carried out assaults on southern France and then raced on to Britain. During the first all-fighter shuttle operation to Russia on July 23, Italy-based Fifteenth Air Force Mustangs and Lightnings blasted Luftwaffe airfields near Ploesti for a 900-mile raid.

By September 10th, Mustangs and other fighters established the greatest escort mission in history when they shepherded more than 3,100 heavy bombers over Europe.

From the outset, the Mustang was considered a pilot's airplane because of its excellent maneuverability and controllability at all speeds and altitudes. Superb visibility for an aircraft of its size contributed much to reducing pilot fatigue on long missions, indirectly adding to the long list of combat victories. The machine was extremely fast and had an edge over enemy aircraft due to its ability to execute a tight turn at high speed. The Mustang is considered the only Allied aircraft that might be com-



Phantom view of the North American P-51B. One of the earlier designs, the B still used the semi-enclosed canopy and had several serious rearward blind spots. These were eliminated in later modifications by use of bubble canopy. Note compact wing structure which gave the rigid skin support required by the laminar flow wing.



P-51E adds tube rocket launchers and directional loop antennae.

pared with the tightly-turning Spitfire in maneuverability. British pilots who were justifiably proud of the venerable Spit agreed that the Mustang was right up with Britain's top fighter on all counts of comfort and flyability.

Excellent stalling characteristics were achieved by precision engineering throughout the design stage of the fighter. A wide wheel tread combined with the low landing speed of 90 mph makes the craft no less desirable on the ground, regardless of terrain. Ground crews favor Mustang maintenance because of simple access to almost any part of the aircraft with a minimum number of tools. Interchangeable parts for the low-sitting aircraft speed turnaround in the field, a large number of access openings in the angular structure insure swift, easy overhaul.

Design Evolution

By the time America entered the war the original North American project No. 73 fighter designed to British specifications was, with slight modification, listed with the USAAF as the XP-51 *Apache*. The *Apache* nomenclature was soon dropped for the familiar Mustang, and the aircraft developed into P-51. Armed with four .50 caliber and four .30 caliber machine guns, with two of the heavier weapons mounted in the underside of the nose with synchronization, the aircraft was pressed into service with the RAF as the Mustang I and the AAF as the P-51. An Allison in-line liquid-cooled V-1710-81 engine developed 1,200 hp at takeoff, 1,000 hp at 14,000 feet with two-stage supercharger. Maximum speed at 17,300 feet was 410 mph, the cruising speed 210 to 300 mph at altitude depending upon mission. Cruising range with a 500-pound explosive is 300 miles at 240 mph; the maximum belly tank range at 240 mph is 2,500 miles. Service ceiling is 36,000 feet; critical altitude about 18,000 feet. Armament modifications of the P-51 included a six

.50 caliber machine-gun arrangement, with 200 rounds per gun. The P-51A carried four .50 caliber wing guns or four 20mm cannon in wing position. Bomb load is 500 to 1,000 pounds with two wing racks. A-36A has four hydraulically operated dive brakes, one above and one below each wing. Each brake was a slatted surface and was hinged to the front spar, the brakes on the upper surface hinging upward and backward and those on the lower surface downward and forward.

A three-bladed Curtiss Electric constant-speed propeller is fitted to the aircraft, with ducted ethylene-glycol and oil radiators under the fuselage and aft of the cockpit with controllable inlet and exit scoops. Self-sealing fuel cells with 170-gallon capacity are fitted within the wings, with a 12-gallon oil tank in the engine compartment.

Models P-51, P-51A and P-51B are fitted with enclosed cockpits over the wing center, with hinged covers. The P-51C features a sliding canopy of Spitfire design, with the plexiglas slightly bulged. P-51D and subsequent models are equipped with the bubble type canopy allowing 360-degree visibility. This arrangement was first tested on the XP-51F, an experimental aircraft employed for flight experimentation of P-51D equipment before the latter machine came off the production lines. All models are equipped with bulletproof windscreens, mount a reinforced crash arc and armor shield behind the pilot.

North American's XP-78 Mustang fighter, cause of much controversy in official recognition files, was one of a group of experimental P-51 series modifications which were designed and built merely to flight-test new equipment. It was the first aircraft to mount the Packard-built 1,520 hp twelve-cylinder Merlin in-line engine.

Wingspan of the P-51 and P-51B is 37 feet 5/16 inches, length 32 feet 2 7/8 inches, and the over-all height 8 feet 8 inches. Gross weight is 7,700 pounds normal, can be

increased to 8,157 pounds without loss of performance.

While the original Mustang was equipped with eight machine guns and the following standard fighter and bomber modifications with six .50 caliber machine guns, the P-51B ordnance was comparatively light—only four .50 caliber weapons. This reduction in firepower was necessitated by drastic redesign of the aircraft as a high altitude fighter, was retained in the P-51C version. Actually, the aircraft has had five major armament changes since the first model, fitting testimony to its high fluidity of design. Current Mustangs are equipped with six .50 caliber wing machine guns, standard practice since the debut of the improved P-51D-5-NA fighter.

P-51s Packed Punch

Some P-51B models have been fitted with the four-cannon arrangement for specialized duties, but the majority of Mustangs following the P-51D mount the standard six-gun arrangement. Toward the war's close, Mustangs and other leading American fighters added a new

punch to their firepower in the form of high velocity wing rocket projectiles. Initial arrangement was in the form of an under-wing jettisonable three-tube cluster. Later Mustangs changed from the bulky three-tube cluster to permanent launching rails, five in number beneath each wing. Each rocket warhead accommodates upward of 60 pounds of TNT. This explosive carriage was utilized in addition to the normal ordnance arrangement and two 1,000-pound bombs.

All pilot controls are at finger tip in the roomy, comfortable cockpit. Forward of the pilot's feet and rudder pedals is the armor plate firewall. Control stick is fitted between the pilot's legs, has a locking feature that enables tail wheel steering. With the stick forward, the tail unit is free to swivel through 360 degrees; with stick pulled back, the tail wheel is controlled by rudder pedals, but limited to six degrees turn to left or right.

Control surfaces of the Mustang are so coordinated that stick pressure for elevator operation duplicates pedal pressure for rudder operation. The rudder is statically and



P-51D Twin-Mustang, built for long-range patrol, climbs 3,000 fpm.



dynamically balanced by a 16-pound lead weight near the top. A 20-pound lead weight at the outer end of each elevator provides static and dynamic balance. In the later P-51D-30-NA version, a dorsal fin was added, effecting a more graceful sweep between the fuselage and vertical fin, and improving the stability in sharp maneuvers.

Two photographic-reconnaissance Mustang modifications were built and flown in combat. The P-51K photo version mounted special cameras in the leading edge of the vertical fin, while the F-6 was combat flown with full complement of fuselage photographic equipment in addition to normal carriage. Several Mustangs were acquired by the U. S. Navy for specialized Pacific operations.

Last of the fighting Mustangs was the P-51H. A Merlin engine stepped up horsepower to 1,825 at takeoff. With 150 octane fuel and water injection, more than 2,000 combat hp rocketed the aircraft's maximum speed to 490 mph. The interceptor P-51H version had a combat radius of 1,104 miles with two 110-gallon drop tanks which were discarded after 1,058 miles of flight. Normal power climb to 25,000 feet was accomplished over 76 miles in 0.41 hours, with escort missions carried out at an average speed of 307 mph. In addition to the normal range, fifteen minutes at military engine power and five minutes at war emergency power was allowed. The aircraft returned to base with reserve fuel for thirty minutes operation at minimum consumption at 5,000 feet. A total of 475 gallons of fuel was carried in external and internal tanks of the P-51H.

Armament included six .50 caliber machine guns firing freely from wing positions with total accommodation of 2,060 rounds. Either two 500- or two 1,000-pound bombs were carried, and as many as ten high velocity five-inch rockets were standard equipment.

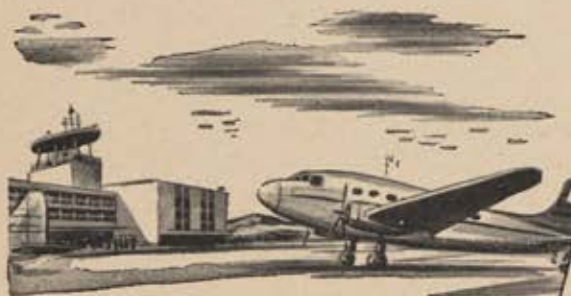
With 9,000 pounds gross weight, a takeoff of 1,325 feet was necessary to clear a fifty-foot obstacle; 1,855 feet for 10,000 pounds gross and 2,270 feet for the 11,000-pound airplane. Rate of climb was in the vicinity of 4,000 feet per minute for the interceptor version, while service ceilings soared slightly above the 40,000-foot mark. An over-all weight saving of 700 pounds, plus a ten per cent increase in structural strength greatly improved all-round maneuverability.

The Mustang is the outstanding product of some 2,700 man-hours of labor for actual fabrication and assembly of the prototype. It is outstanding not because any one man or group had a superior inspiration; rather because many small jobs were done a little better by men who gained experience over a long period of work-filled years. These men pooled their efforts in a smooth-functioning organization to produce a single reciprocating-engine design believed by many to be superior to anything developed by the enemy.

Among the top-scoring aces of the ETO were Mustang pilots Captain John F. Thornell, Jr. of East Walpole, Mass., who bagged twenty aircraft, Major Don S. Gentile, of Piqua, Ohio, and famed wing man Captain H. W. "Tex" Brown from Washington, D. C.

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NEWS

WAC Drive for AFA

Former WAC Warrant Officer Mary Gill, who was Lt. General Jimmie Doolittle's secretary in England and still is his No. 1 gal at Shell Oil, announced that she was starting a special drive to recruit former AAF WACs for the Air Force Association. Miss Gill's plan of action is to organize the girls into temporary all-women's squadrons, then assign them to their respective local squadrons at some later date.

Miss Gill explained that the average WAC's wartime service left her with a deep-rooted interest in aviation, and there was a need for the organization through which the former members of the Corps could continue the friendships made in service.

Contrary to the impression left by an interview published early in August in a New York newspaper, this drive was not intended to form a new all-women's outfit, either separate from or auxiliary to the parent AFA group. It was formed to satisfy the peculiar needs for organizing women. "We were part of the same AAF the men were!" the ex-Warrant Officer explains. "We want to retain the relationship."

The first get-together for the women's drive was announced for August 29th at the Wings Club in New York. The goal is to recruit most of the 40,000 WACs who served in the AAF.

New News Service

Major Kendall K. Hoyt, known as one of the nation's top-flight aviation writers for the past decade, announced the introduction of a weekly newsletter for airmen and allied aviation personnel, edited out of Washington. Before entering the Army, where he served as AAF officer for the Civil Air Patrol, Major Hoyt edited a newsletter for one of the most influential national aviation organizations. He plans to make this enterprise the first American-source newsletter to be edited from a totally independent viewpoints, covering all phases of aviation.



Bob Lewis, co-pilot on the "Enola Gay" when it loosed the A-bomb on Hiroshima, flies for American between New York and London.

Another New Director

John P. Biehn, vice president of the Ohio National Bank of Columbus, Ohio, has been elected a member of the AFA Board of Directors.

Mr. Biehn, who served as a private in the Army Air Forces during World War II, is a graduate of the AAF Cryptography School at Pawling, N. Y., and was also stationed during his service at Miami, Florida, and Jefferson Barracks, Missouri.

Before entering the banking business in 1940, Mr. Biehn was for many years a reporter and political writer for the Dayton, O., *Daily News*, The Associated Press and the Columbus, O., *Dispatch*.

He is chairman of the Columbus Airport Commission; president of the Young Business Men's Club of Columbus, and a member of the Franklin County Planning Commission, the Columbus Marketing Commission and the Columbus Chamber of Commerce.

And More On The Way

Three new Squadrons of the Air Force Association have recently been granted charters.

In Paducah, Kentucky, 20 former Air Force men formed a chapter and elected James C. Rieke Commander. At Middle River, Maryland, that state's second Squadron was organized with 20 charter members, who named Louis Fink their Commander. Seventy-eight AAF veterans in Phoenix, Arizona, have established a live wire outfit which is growing daily, according to reports from Commander Gordon N. Scott.

Going Up

Membership applications received at National Headquarters have taken another sharp upswing since Air Force Day. From a weekly average of 1,800 new members during July, the count has now reached about 3,000 and is still climbing.



Master Sgt. S. J. Shipple of the 46th Recon Sqdn, Grand Island Army Air Field enlists two new recruits in the rapidly expanding A.F.A.



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corner garage of the air

Aviation, long a laggard in parts and servicing facilities, catches up with its own version of the corner garage

NINETEEN years ago—in the spring of 1928—a young air-minded automobile salesman, filled with the anticipated fun and business value of owning an airplane, laid \$2,500 cash on the line for a used OX-5 Eaglerock. In less than six months, the flying automobile salesman had covered thousands of miles, had been at scores of airports throughout the country, taken dozens of friends for sight-seeing rides. On the other side of the ledger, though, were a group of liabilities that came with flying in those days—maintenance and overhaul costs that in approximately 200 hours flying *exceeded* the original cost of the plane, days of delays at cow-pasture airports waiting for engine or plane parts to come from eastern factories, poor servicing that resulted in forced landings and still more expense and delay.

During the many enforced lay-overs at fields for his plane to be serviced or repaired, automotive salesman Earl Herring slowly put together in his mind the basic

blueprint of what today is Pacific Airmotive Corporation, Glendale, California, of which he is president. He foresaw that there could never be widespread use of private or commercial planes unless sound business methods and order replaced the chaos then attached to maintenance and servicing of them. Inquiry among other plane owners disclosed similar views.

By 1930 Herring had made enough revisions to his original plans for a modern aircraft servicing and maintenance organization to leave the automotive industry and turn his full efforts to aviation. During the three succeeding years, as a commercial pilot, he studied the plane owners' requirements and the methods that would economically meet their needs. Based on his studies in 1933 Herring established his first aviation supply company with the aid of Pacific Airmotive, which at that time was engaged solely in overhaul and maintenance work. By 1937 sufficient experience had been accumulated for Her-

Flight line, customer service, at Pacific Airmotive's base at Burbank, California. Picture shows how grouping of power plants allows virtual line-production in routine service.



ring and his associates to lay final plans for a new service to serve five distinct portions of the then infant industry:

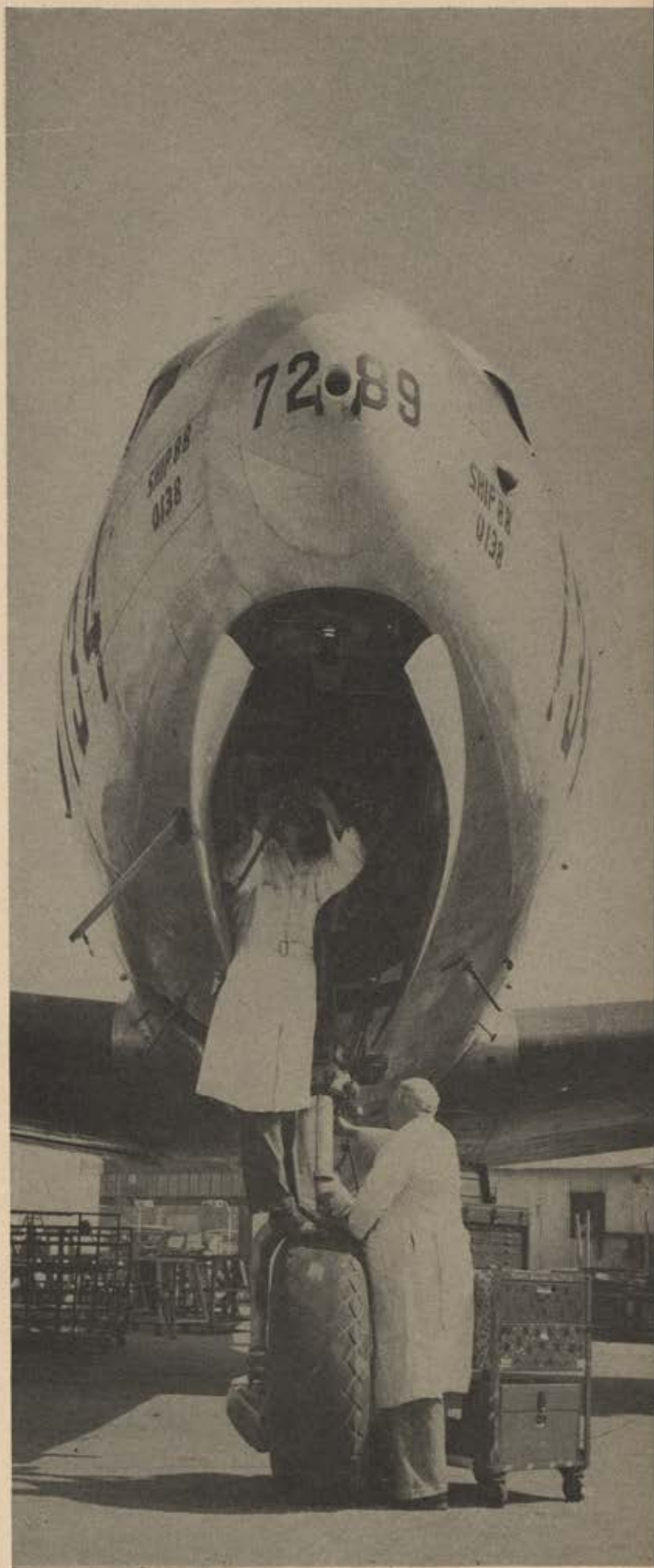
1. The plane manufacturers—by giving owners of their planes service and overhaul facilities necessary to keep them in the air safely and economically.
2. The parts and equipment manufacturers—by providing them with a distributing and sales organization located on airports, staffed by people who knew aviation equipment, installation and sales problems.
3. The airport service operators—by providing them with overhaul facilities at strategically located bases to which they could send work requiring precision machinery and facilities justifiable only where large volumes of such work were being handled daily; and with service parts and equipment lines for their use or resale to the retail trade.
4. The private airplane owners—by the use of factory service, repair and overhaul methods that insured factory-standard work at production-line rates; and complete stocks of service parts and airplane equipment to eliminate delays—from either the PAC bases or their dealers.
5. The commercial operator and airlines—by the equipping of shops with extensive overhaul and repair machinery, and the mechanics experienced in such work, that could handle a wide variety of maintenance and overhaul for many firms at a lower cost than could be achieved if each firm had to invest in similar equipment for its sole use.

The measure of how successful this original plan was is today's operations of Pacific Airmotive. The original bases at Burbank and Oakland were purchased by Herring and his associates in 1939 and have since been augmented by other bases at San Diego, Glendale, Fresno, San Jose, Seattle, Anchorage, Alaska, and Kansas City, Missouri. At Glendale is the nation's largest retail aviation equipment store, which PAC opened in 1945. Besides these bases, they have a widespread dealer organization. As this is written, negotiations are under way to acquire a number of eastern and Atlantic Coast bases.

One of the many features of the PAC dealer plan is the use of flat rates on standard service operations, uniform work-order and billing procedures developed during the past 15 years at the PAC bases, standardized identification signs on hangars and buildings, and check-chart methods of plane inspections to save time for the dealers and cost to the plane owners. An objective of their dealer plan is to provide private and commercial plane owners with uniformly high standards of service closely spaced over the entire country, and all operated under a basic policy.

Overhaul, repair and service facilities at the present nine PAC bases now utilize more than 40 buildings, embracing over 300,000 square feet. Their new plant at Burbank, to be completed late this year, will add more than 180,000 feet of the most modern facilities. At these bases have been maintained the planes of such prominent fliers as Amelia Earhart, Wiley Post, Paul Mantz, Henry King, Sir Hubert Wilkins, Art Goble, Roscoe Turner, Jacqueline Cochran and scores of others from the "Who's Who in Aviation."

Airline, nonscheduled cargo operator and executive transport maintenance and overhaul are concentrated at



Airline job. Converting a former Army C-54 transport into a DC-4 airliner; one of most complex, lucrative of shop-type operations.

Burbank, Oakland and Anchorage. There the planes, engines, propellers or equipment of a dozen and a half such companies are presently handled on a production line basis with tools and jigs especially built to maintain airline standards.

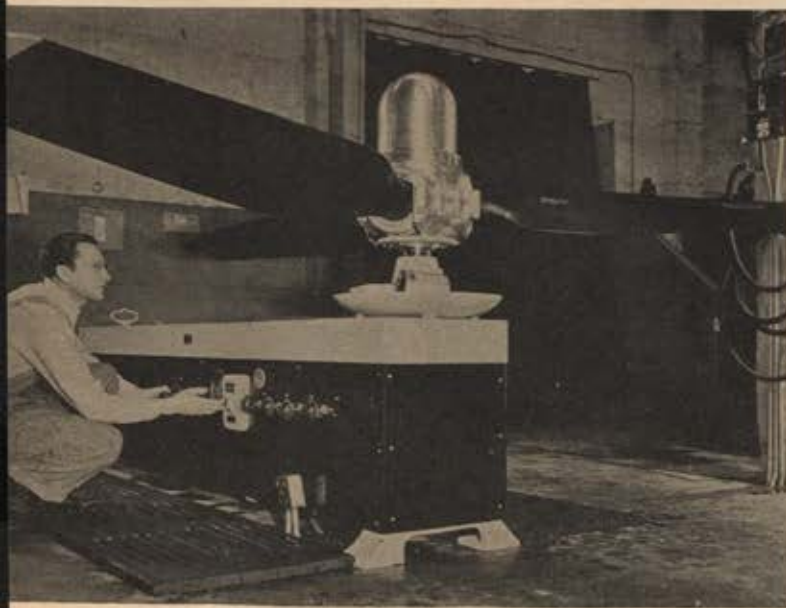
In addition to the routine overhaul and maintenance for these agencies, PAC also works closely with Douglas and Consolidated on modification of personnel transports. During the war PAC averaged overhauling 75 Pratt & Whitney R-2000's per month, in addition to their airline maintenance and other programs. For the Naval Air Transport Service and Consairways alone, many millions of dollars of maintenance, service and overhaul work was completed between 1942 and 1946 and the Navy conferred on PAC its Certificate of Achievement in September, 1945.

To expedite the overhauling and servicing of large engines are complete carburetor, ignition and hydraulic testing departments, as well as test stands that handle engines up to 5,000 hp.

As distributors and jobbers for more than 300 leading lines of aviation equipment, PAC can rightfully lay claim to being the largest aviation supply and maintenance organization in the world. Inventories of these items are maintained at their nine bases, from which they supply their growing dealer organization and the local retail trade. To supply their retail and wholesale trade PAC has found it necessary to maintain over 300,000 different items in stock. And this number is being expanded.

Entry into the jobbing business reflects Herring's early analysis of airplane maintenance problems. Control over sources of engine and airplane repair parts was found necessary at the outset to insure a smooth flow of work in the shops. Stocking of adequate volumes of parts soon led to smaller repair bases drawing on PAC for their needs. That was later followed by commercial plane owners and airframe manufacturers obtaining their needs from the growing chain of PAC bases. It was only another short step to establishing retail stores stocked with all types of aviation supplies and warehouses for distribution to dealers. Experience gained in retail merchandising of

Detailed service. Big Hamilton-Standard propeller is checked on special test-stand developed by PAC to simplify airscrew maintenance.



Former "Fatcat Skytrain," plush-seated Army C-117-A undergoes changes at PAC before going to KNILM for transpacific operations.

aviation equipment at the company-operated stores gives their dealer organization invaluable information on displays, stocks and merchandising methods.

An outgrowth of the overhaul and distributing activities is the recently established exchange plan on engines, carburetors, certain electrical and other accessory equipment. It has already been found that PAC dealers are able to increase substantially their volume of engine overhauling without capital expense for tools, by merely shipping the engines or accessories to a near-by PAC base, and receiving a rebuilt replacement for installation. Engines or accessories thus received at the PAC bases are overhauled on a production-line basis and stored, awaiting orders from dealers.

Construction of the new \$2,000,000 Burbank headquarters of the firm is now starting on a 22-acre tract adjoining Lockheed Air Terminal and is scheduled for completion late this year. Manufacturing of PAC maintenance equipment, developed especially for commercial and military maintenance bases, and PAC model plane gas engines will be consolidated in this new plant.

Among the rapidly growing number of employees at PAC are many Air Forces veterans in maintenance, overhaul and retail sales activities. Those holding CAA aircraft or engine mechanics certificates are assigned to mechanical work, whereas others more interested in sales, service or merchandising are given an opportunity in those departments. Typical of their veteran employment program is the case of a major, with master pilot rating, who was interested in merchandising. His first assignment was as shipping clerk in the Glendale store, following that as a stock-chaser, then to the retail sales counter. Progressively he was assigned to other and more important duties, and today is a traveling representative of the firm assigned to work with the PAC dealers in their merchandising activities. As this is written, more than 300 ex-Air Forces men are employed by the firm.



... Naval chronology of this war, and a history of the U. S. Navy and Coast Guard ... lead off this magnificent wartime catalogue of naval power afloat or sunk.
—Columbus (Ohio) Citizen.



Air News Yearbook Vol. 2 ... combines tersely told histories of aviation by nations and an exquisite array of photographs that stand out like finished portraits.
—Montgomery (Ala.) Register.



It is a large volume, crammed with magnificent pictures—and if there is anything missing as to the history, development and use of tanks, I can't imagine what it could be.
—Springfield (Mass.) Evening Union.

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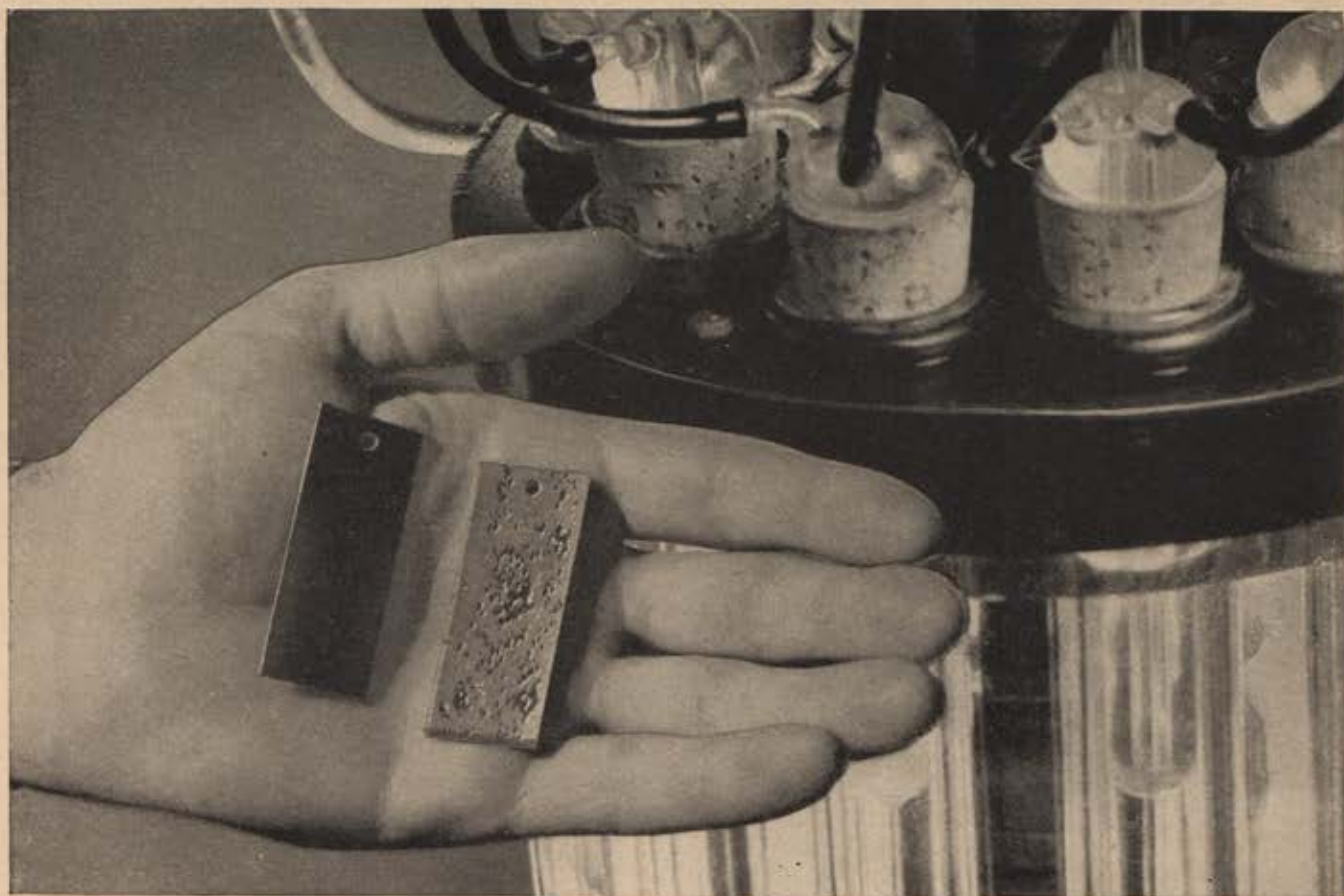
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- ☐ NAVY YEARBOOK 1.25
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- ☐ ALL THREE, BEAUTIFULLY BOXED 3.00

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All American Aviation

their business is picking up

All American Aviation offers Air-Mail Service now, cargo and express tomorrow to communities lacking airport facilities

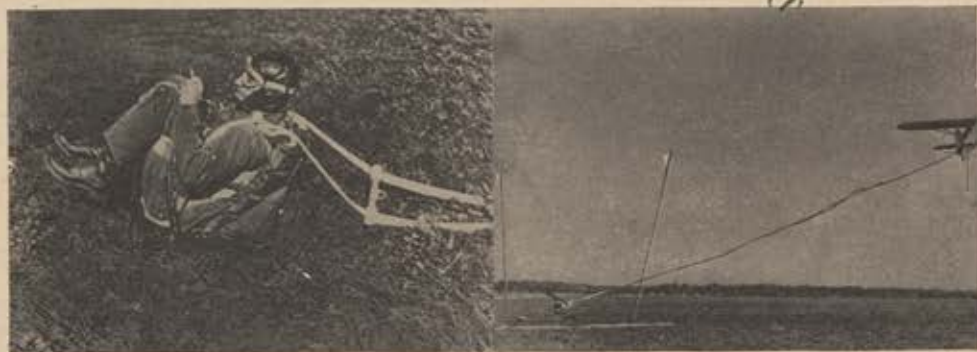
SISTERSVILLE, West Virginia is listed in Hammond's Atlas with a population of 2,702. From a fiscal point of view, this community scarcely merits an air terminal. Yet Sistersville, West Virginia has direct air-mail service. Letters air-mailed to this quiet city on the Ohio River travel the entire distance by airplane, not merely to a terminal point on the main air route and thence to their destination by ground transportation. Sistersville is one of the 117 cities on the six-state network of All American Aviation, which has adapted to aviation use the old railroad system of on-the-run mail pick-up and delivery for milk-stop towns.

Under the current All American operation, planes leave Wilmington, Delaware and Pittsburgh, Penna., four times daily. When they approach any of the 115 communities which they serve, either the plane or control tower radios the contact time to the local representative, who has in the meantime collected outgoing mail and light cargo and stowed it in a specially built shockproof container. To this cylinder is attached a loop of rubber shock cord. The representative drives to the site a few minutes before the

radioed contact time, allowing two minutes to set up the pick-up tackle. This consists of two tall poles, built in two sections of steel bottom and flexible wood or bamboo top. These poles are set in the ground about twenty feet apart. The rubber rope carrying the mail sack is looped into brackets atop the two poles so that it forms a triangle with the section between the two poles as the base and the mail bag, parked on the ground, as the apex.

On regular All American runs the pick-up planes are single-engined gull-wing Stinsons. Crew consists of pilot and flight mechanic. The plane makes a low approach to the pick-up spot and the mechanic lowers the pick-up arm onto which a special hook is attached. The arm contacts the section of the rope stretched between the poles as the plane flies over. As the hook makes contact, it closes and is detached from the pick-up arm. The flight mechanic then activates the electrically operated winch inside the airplane, and the mail sack is hoisted into the plane. A braking device on the reel couples with the native elasticity of the cable and transfer rope to absorb part of the take-off shock.

The original test on human pick-up was conducted at Wright Field in September, 1943. Photos show Lt. Alexis Doster in the experimental body harness, next the pick-up plane making contact, reeling the passenger in, and hauling him in. Below, right, the proposed sea-rescue pick-up rig.





For passenger plus pick-up service in the Allegheny-Ohio area, All American has ordered Lockheed grass-roots airliner, the Saturn.

Mail to be delivered is simply dropped from the plane in the same special shockproof units.

Pick-up Has a History

The theory of air-from-ground pick-up is hardly new. Back in the days of the flying circus, one of the "hair-raising stunts" involved a wing walker's hanging from a reinforced wing skid by his knees to pick up a straw hat. Considerable experimenting went on in the 1920's. On one occasion a refueling-endurance record was planned whereby the fuel was to be delivered to the airplane by pick-up. As a matter of fact, the operation was regarded pretty much as an airshow stunt until the mid-thirties, when All American was formed.

The original routes for All American were laid out in 1938, and during the spring of 1939 two routes, moving out of Pittsburgh and serving Pennsylvania and West Virginia, were established. These routes covered the notorious "Hell Stretch" country, the graveyard of many pioneer pilots in the early air-mail days.

Typical approach and contact made during the prewar experimental runs of All American, with gull-winged Stinsons. Considerable re-

Nevertheless, All American operated its 1,040-mile run for a year, at the end of which time it had proved that the system could pay for itself in three years. Most of the major airlines figure on two full decades to accomplish the same thing.

During the pioneer years of operation pick-up planes ventured out in weather that frequently stopped ground transportation, served areas which had been cut off by flood, and brought mail into Pittsburgh when the airport was snowed under.

Pick-up at War

Pick-up in its practical form was pioneered by Richard C. du Pont. Best known as a glider enthusiast, Du Pont acted as civilian head of the AAF's military glider program until his death in 1943. During the development of this program, pick-up devices were adapted to the tasks of recovering gliders and picking up trapped personnel and casualties from places inaccessible to hospital planes.

As early as 1941 the late Lewin Barringer, first head of the AAF's Glider Command, demonstrated the effectiveness of glider pick-up. When the AAF showed interest in the operation, All American set its engineers to work scaling up the equipment to use heavier rope, larger and powerful anchors in single and multiple tows for cargo and combat gliders yet unplanned. This development put U. S. gliders technically ahead of the Nazis'. German combat gliders were totally expendable, could be used only once. In Burma, in Normandy on D-Day, the pick-up system paid its way in the multiple use of transport gliders for invasion and for evacuation of the wounded.

Personnel Pick-up

One spectacular use of the pick-up, outwardly resembling a performance of the old Gates Flying Circus, was first demonstrated at Wright Field in September, 1943. A young paratrooper, Lt. Alexis Doster, propped himself against a special parachute harness which was attached on the ground to the characteristic two poles of the All American pick-up.

A Noorduyt Norseman cargo monoplane made the

search was conducted to develop the special container which could stand the jar of drop and pick-up without damaging the contents.



conventional pick-up approach, lowering the contact arm. In the same manner as mail bags and gliders, Doster was yanked 500 feet into the air at the end of a nylon rope and reeled into the cabin of the airplane. Brief minutes later he was sitting inside the airplane, no worse for wear.

The 1943 human experiment, which incidentally earned for Lt. Doster the Distinguished Flying Cross, was followed by a year of intensive development. The harness was simplified and strengthened, improved plane-rigs were devised, and a brief but to-the-point booklet was written to be dropped with the pick-up gear. Complete pick-up outfits could thus be dropped to persons who might be stranded in inaccessible places. A special raft was designed to allow pick-up of marine disaster.

Peacetime Application

When pick-up was first conceived as a capillary link in the nation's airline system, it was envisioned as part of the regular local-plane service, that is, as equipment added to regular passenger-carrying craft. Such operations would be safe and feasible. Further, it would make service financially possible in those areas where passenger revenue alone might not justify the routes.

The experimental phase of the service was conducted over the difficult terrain of the Ohio River Valley and the rugged Alleghenies in single-engined airplanes carrying only mail and rudimentary express. The second phase of All American's development was heralded by a recent announcement that new Lockheed Saturns have been ordered to serve 120 communities on a short-haul system. All American previously had petitioned the Civil Aeronautics Board for franchise to provide these places with full-stop passenger and cargo service. This was to be in addition to those cities currently being served by the pick-up mail. The system will continue to serve the same area but will join the smaller communities to such centers as Cleveland, Cincinnati, Harrisburg, Philadelphia, Pittsburgh, Albany, Schenectady, New York City, Atlantic City, Wilmington, Del., Baltimore, Winston-Salem, Wheeling, and Washington, D. C.

Knowledge gathered from military experience with cargo and combat gliders is to be put to work. In areas too

Postwar plans call for cargo-glider pick-up for towns without airports, using glider recovery technique developed during the war.



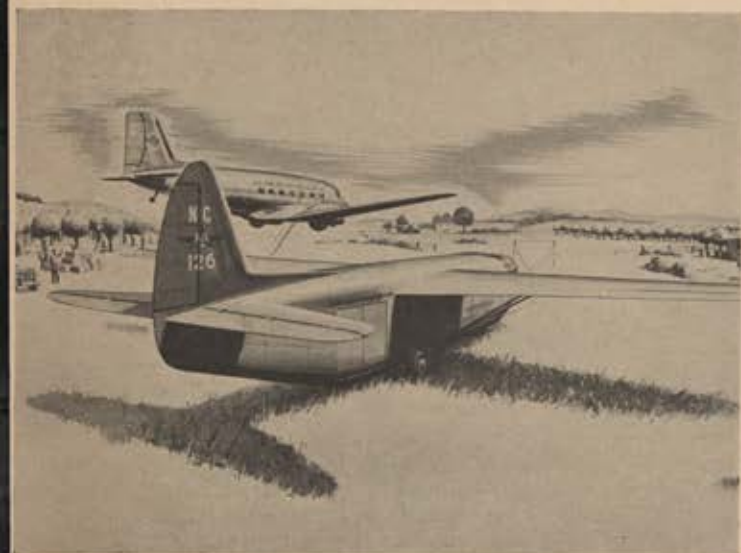
All American's president, Col. Robert M. Love came from Air Transport Command. Right, A-A founder, the late Richard C. du Pont.

small to justify power plane landings, products can be put aboard freight gliders and picked up by a passing plane. Thus a single tug plane could serve a number of communities. The system might be used in out-of-the-way operations like lumbering, mining, etc., for the transportation of personnel and supplies. Wartime demonstrations were made on marine gliders, and it was proven that pick-ups worked as well from water as from land. Use of the glider-drop and pick-up, with its relatively low operating cost, may unlock areas with rich natural resources.

If the airplane is to compete with ground vehicles, it must follow the example of ground transportation in that no community in the nation should be outside the range of its services. Considering the cost of airports, it will be quite a while before most towns with populations of 10,000 or less can afford a practical passenger terminal or before the traffic generated would justify such construction by private enterprise. But as long as a cleared-off pasture, a couple of poles, and a length of rubber rope is all that is needed to bind Main Street to Broadway, no town, however small, need be marked off the airways map.

Pick-up is not the landplane's exclusive province. Catalinas can be used for same purpose, as well as for pick-up tow of special gliders.

their business is picking up



For future reference—last months entries in aviation's personal ledger

For the Record



15 JULY.

T. P. Wright of C.A.A. called on researchers and plane builders alike to find some way to reduce airplane noise. High sound levels were making airports unwelcome in many communities, a factor that was holding up air progress.

16 JULY.

NACA's Ames Aeronautical Laboratories at Moffett Field, California were put into operation. This group includes "the world's most versatile wind tunnel," a tool reputed to be able to handle high-speed research at pressures up to 36 atmospheres.

17 JULY.

Starr Truscott, NACA's top hydrodynamiscist, died suddenly at his Hampton, Virginia home at the age of 60.

An R.A.F. Lancaster bomber squadron landed at Mitchel Field, after an ocean crossing on "Operation Goodwill."

20 JULY.

U.S. Strategic Bombing Survey, noted group of civilian experts who studied the effects of bombing in Europe and Asia, informed President Truman that the nation's only hope for defense against air attack in the future lay in a radically conceived super air force.

22 JULY.

Maj. General Curtis LeMay revealed that Fairchild Engine and Airplane Co. was given a special contract to study the possibilities of using atomic power to propel aircraft.

A jet-powered Navy fighter, the XFD-1 was landed on the U.S. aircraft carrier *Franklin D. Roosevelt*, the first time an all-jet plane was operated from an American flattop.

25 JULY.

Senate ratifies U.S. membership in the International Civil Aviation Organization.

28 JULY.

General Curtis LeMay announced plans for a high-altitude rocket program. Some types currently under consideration would be able to climb to a height of 130 miles.

31 JULY.

Board examining the Lockheed Constellation, recently victim of two powerplant fires, lays grief to minor maladjustment in the craft's electrical system.

1 AUGUST.

Air Force's 39th Birthday. P-80's

demonstrated in Germany, B-29's shown to Japanese population close up for the first time in Tokyo. Superfort under command of Captain Boyd L. Grunough, sets a new transcontinental record, Burbank, California to New York in 7 hours 28 minutes.

2 AUGUST.

Civil Aeronautics Board reinstates Lockheed Constellations for passenger use with modifications in ignition and electrical systems and fire extinguishing equipment.

3 AUGUST.

Captain Leonard Wiehrdt of Wright field cracks P-80 up at Pittsburgh, Pa. and suffers only a cut on his head, becoming the first pilot to survive a jet-plane crash.

5 AUGUST.

Caterpillar Club, since 1922 the informal organization for those who have used a parachute to save their lives in an emergency, announced that they were going to form regular local chapters. Before Pearl Harbor, there were only about a thousand members in the U.S. altogether. New York City alone boasts that number now. Plans call for about 300 local chapters in the U. S.

7 AUGUST.

C.A.A. announced the amount to be spent on Federal aid to airports during 1947; a total of \$45,000,000. The state of Texas got the largest state share, \$2,081,311.

9 AUGUST.

The Moody Bible Institute, of Chicago announced the inclusion of flight training in their course for missionaries. The course, designed to extend the scope of mission personnel, includes not only flight instruction, navigation, meteorology and aircraft maintenance but also foreign air regulations, and specialized operations under extreme conditions of heat and cold.

11 AUGUST.

Yugoslav fighter planes down a U.S. C-47 plane near Ljubljana.

14 AUGUST.

An R.A.F. Gloster Meteor jet plans set a new speed record of 626 mph at 5000 feet, bettering the existing 606 mark by a fair margin. The flight was a preliminary test, which will be followed by an official assault on the record, as soon as weather permits. Group Captain

Edward Donaldson, the pilot, indicated that the craft's speed at that altitude was limited only by compressibility effect.

15 AUGUST.

The B-29 carrying the Army National Geographic Society's joint cosmic ray expedition arrived in Washington after completing three months of extensive flight explorations from Northern Canada to Peru. The expedition, which carried special cosmic ray equipment, made observation flights under varied conditions at 5,000, 15,000, 25,000 and 35,000 foot levels. Among the conclusions brought back by the flight was the existence of an inter-stellar cosmic ray 50 billion times more powerful than the atomic bomb's blast.

17 AUGUST.

The Douglas B-19, progenitor of thousands of heavy bombers that helped pulverize the enemy during war years, was turned out to grass today without ever having seen combat itself. Its pasture; the Army Air Forces Museum at Tucson, Arizona.

20 AUGUST.

Generals James Doolittle and David Sarnoff arrived in Stockholm on separate "business" missions, proffered their joint technical services in helping the Swedish Defense Staff locate the launching point of "mystery rockets" which reportedly have been violating Swedish skies in recent weeks.

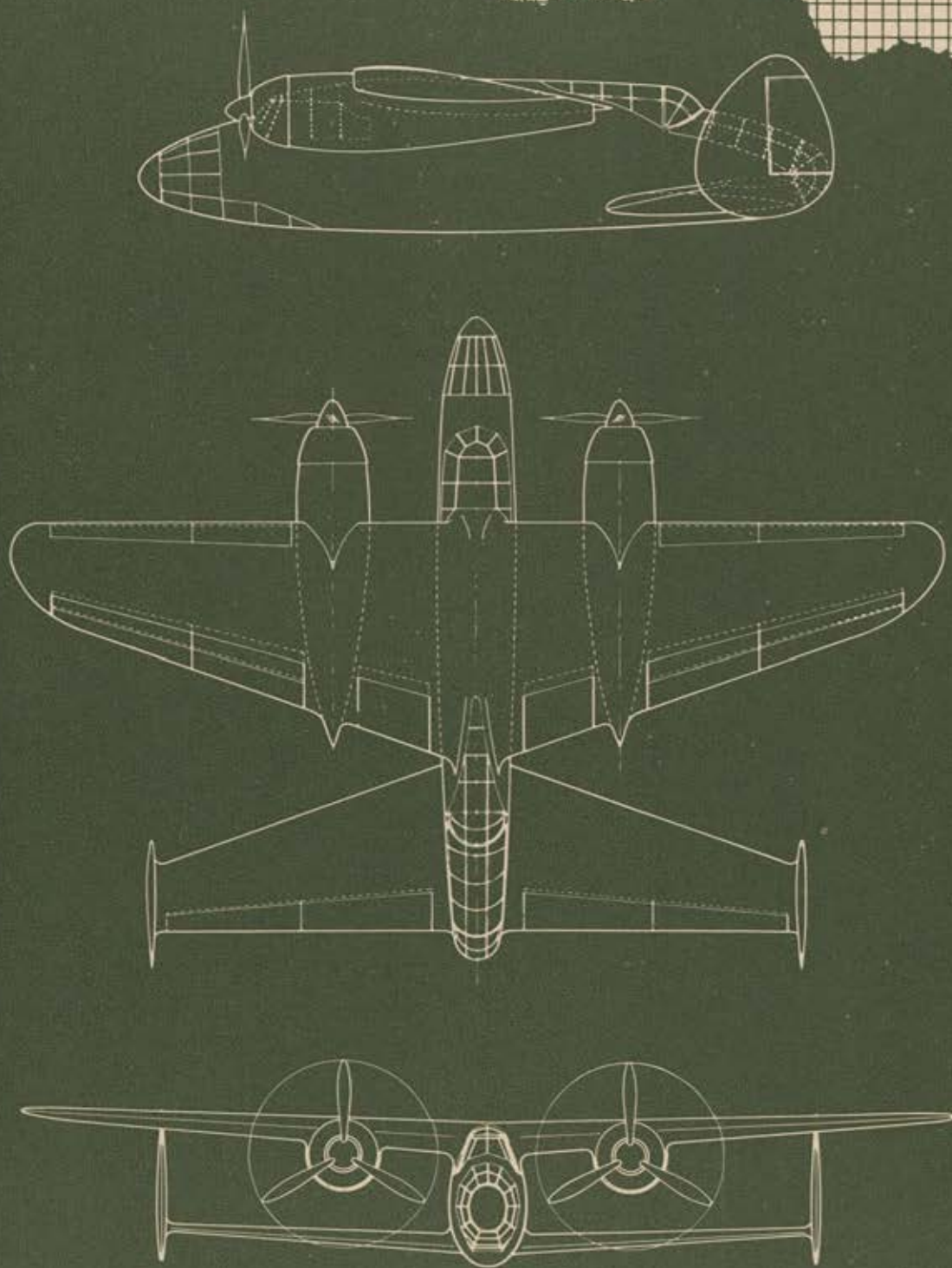
22 AUGUST.

After three years abuilding, the 92-ton Lockheed Constitution was unveiled in California for a few hours to give the press a peep. It will be test flown in September and thereafter delivered to the U.S. Navy for transport service.

22 AUGUST.

Yugoslavia received an American ultimatum to release within forty-eight hours the occupants of two AAF planes shot down over her territory, or have the matter go to the Security Council for prompt action. Belgrade said the attacks were an "accident." A U.S. note said they were "outrageous acts." The full story of how the two ships happened to be over Yugoslav territory—whether it was bad weather or carelessness—was not yet known. Regardless of the reason, there seemed little provocation for their being fired upon by a supposedly friendly nation.

Air Tech



M. Delanne's **DOUBLE MONOPLANE** ►

Delanne's tailless double monoplane presents a practical solution to the landing problem of high speed aircraft

BY WILLIAM S. FRIEDMAN

THIS is the best thing we have got out of French aviation." Such was the opinion of the Nazi technical mission after studying the unconventional tailless tandem-winged two-place fighter which was Delanne's 10-C-2. Typical of the Maginot-line mentality which dogged France's prewar defense planning, this remarkable airplane never got beyond the prototype stage before the Nazis inspected their scientific loot during the fateful summer of 1940. The Germans discovered that the Delanne fighter, powered by only 860 horsepower, could carry a pilot and gunner, a 20mm cannon firing through the hub, four 50-caliber class wing guns and a four-gun electric turret in the tail. Despite all this equipment, it could top 365 mph and land at less than 60 mph.

Two questions arise from this report: (1) how did the craft achieve this performance, and (2) why didn't the Nazis produce this supercraft?

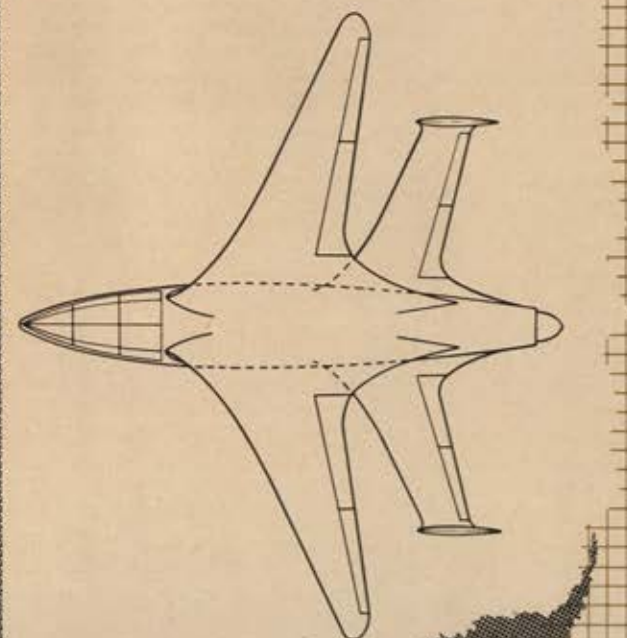
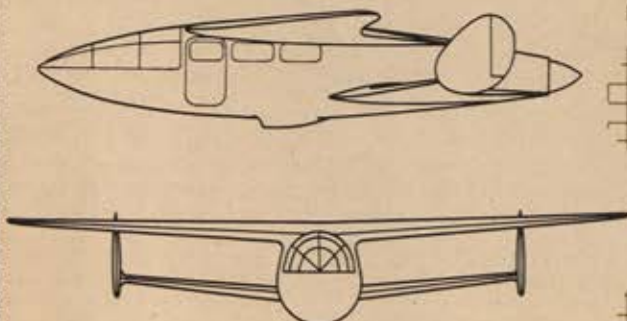
The second question is easier to answer than the first. When the Nazis moved in on France after the tragic capitulation in the Ardennes, the Delanne looked like the answer to Britain's Boulton-Paul Defiant. It had better low-altitude performance; it carried a lot of hitting power forward as well as a tail-turret situated aft of the empennage with 85 degrees of azimuth travel and an astral arc of over 90; its handling characteristics close to the ground made it just what the Luftwaffe needed for close-support work in Russia.

Maurice Henry Delanne counts among his accomplishments the first semi-monocoque wing, built of plywood in 1927, some of the best gliders that ever flew, and a score of conventional aircraft. He had evolved his thesis for the double monoplane over a decade of careful research and experiment. His design philosophy distributed the lifting surface of a craft into two nearly equal planes, both roughly triangular with apexes facing inward.

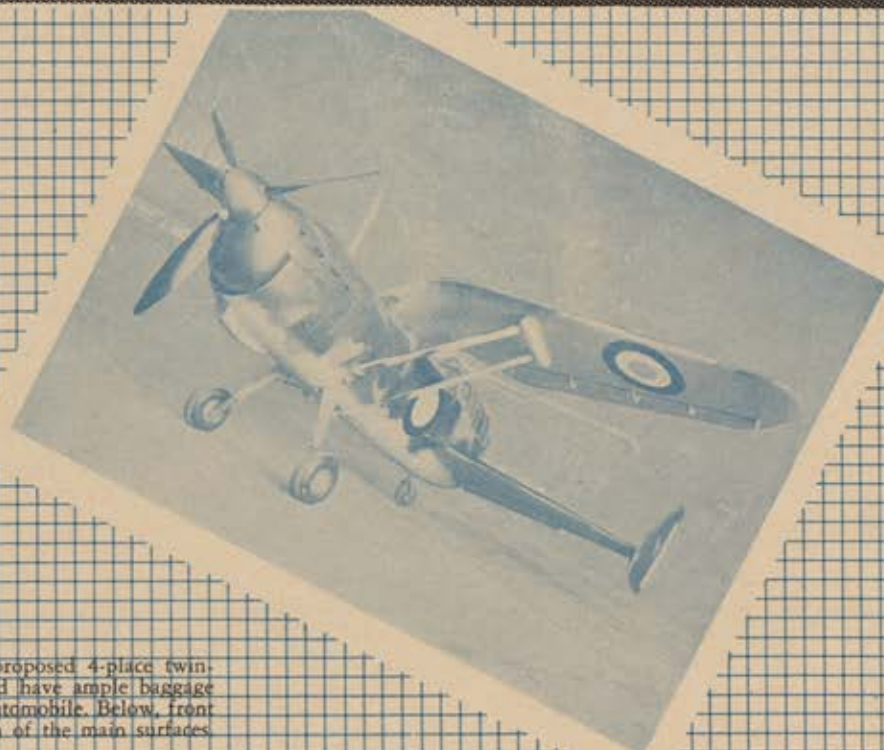
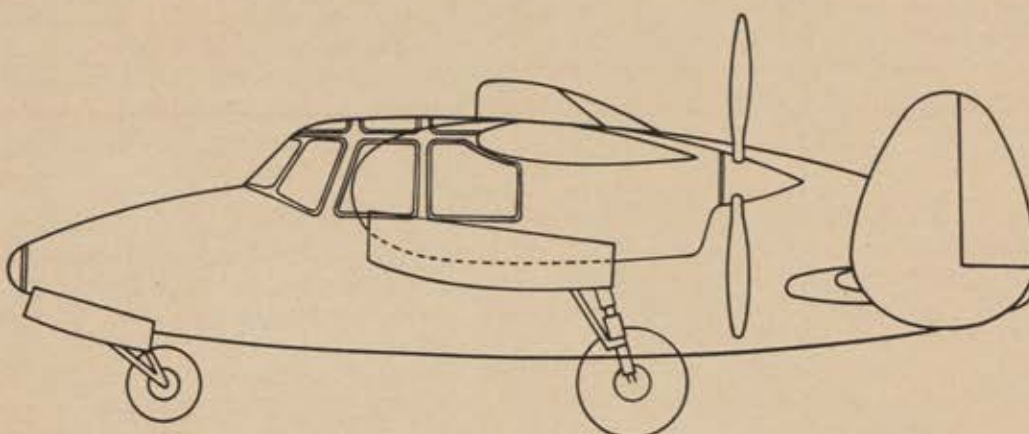
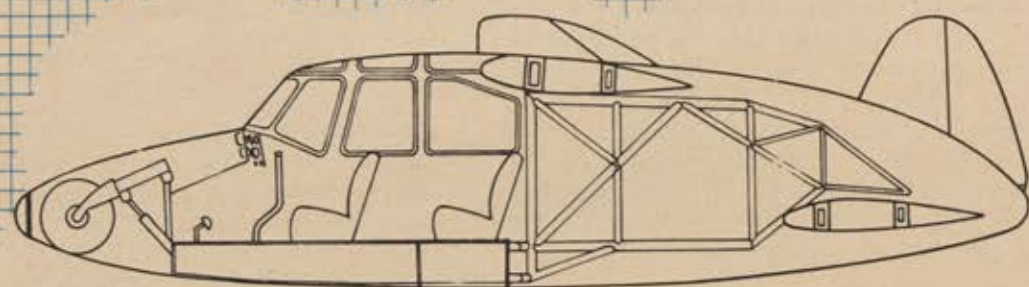
The Germans moved in, and the Vichy Air Ministry ordered Delanne to "coöperate" in their program for building a considerable number of Delanne-type craft. The Nazis had already virtually stripped his plant of tools, but Delanne had been instructed to complete tests on his two-place design, and prepare it for production in Germany.

Heydrich, the notorious Nazi killer, once wrote, "Beware the opposition of mild-mannered men." One morning the Bosche awoke to discover that the "unresisting" French scientist had been stalling for a full year. That the prototype had been sabotaged, that the test-flight figures they had accepted were fictional and of no value, that all the subtle mathematics that had made the double monoplane practical, had vanished. As a final blow, the last remaining prototype managed to be "in the way" when the Allies raided a certain French air field.

Once the SS caught on to Delanne, retribution was swift. He sat in one of their most miserable briggs for three years, to contemplate a mild man's victory—no double monoplane ever opposed the forces of freedom.



Tailwise view of Delanne's prewar sport trainer, showing the unique combination of functions in the rear surface. Below, three-view drawings of a proposed seven-place light transport powered by a small axial-flow jet engine. Like the Gloster Meteor, this design developed power plant and airframe at the same time. Top speed may exceed 500 mph.



Interior and exterior profile views of the proposed 4-place twin-engine double monoplane. The craft would have ample baggage space and still be shorter than the average automobile. Below, front three-quarter view, showing relative position of the main surfaces.

Delanne had ample time as well in those three years to ponder new uses for his tailless design. Two successful types had already been completed. The 20 EXP was an aerobatic trainer which, during its acceptance flight in 1937, had shown unmatched slow-speed characteristics for a craft of its class. In competitive flights against both monoplanes and biplanes of conventional design, the 20 EXP showed that it was able to take off on its 180-hp six-in-line Regnier engine over an obstacle about 65 feet high from a dead start 1,250 feet away. While many of the other ships submitted on this bid failed to qualify, the Delanne design cleared the barrier by some 115 feet. Then, as an additional demonstration, Delanne cut the throttle over the hurdle and, still holding the plane in a maximum climb position, mashed his ship into the ground—a perfect landing from over 175 feet.

The How of the Double Monoplane

Double monoplanes, as such, are not particularly new. Mignet's *Pou de Ciel*, any number of canard ships built in Germany, France, the United States, and Sweden have been flown and have shown their superiority, in some characteristics, to conventional aircraft. Invariably, however, they have sacrificed something for increased inherent stability, in most cases cruising speed, through the addition of a tail to an already cluttered airframe. The double monoplane, on the other hand, incorporates the usual horizontal functions of the empennage into the rear airfoil, so that the stabilizer and elevator, which are part of the rear surface, offer an efficient lifting surface when not in use.

A conspicuous advantage of the Delanne design is the interlocking effect of the two wings. In normal flight they are spaced far enough apart in both length and depth to prevent interference between the two airfoils. However, the compressive effect of the forward wing feeds air already under considerable compression to the rear plane. In the

Rear view of Delanne's support-fighter before the turret was installed, showing the elevators and ailerons in the rear surface. To the right, the aerobatic sport model, powered by a 180-hp six-in-line Regnier engine, that "landed" from an altitude of over 150 feet.



wind-tunnel tests conducted at the Eiffel Laboratory in 1935 the model indicated 22 per cent greater lift than conventional-winged aircraft similar in wing loading and relative cleanness of design. When the prototype was flown at Chalais Meudon during the summer of 1938, it demonstrated 35 per cent better lift performance.

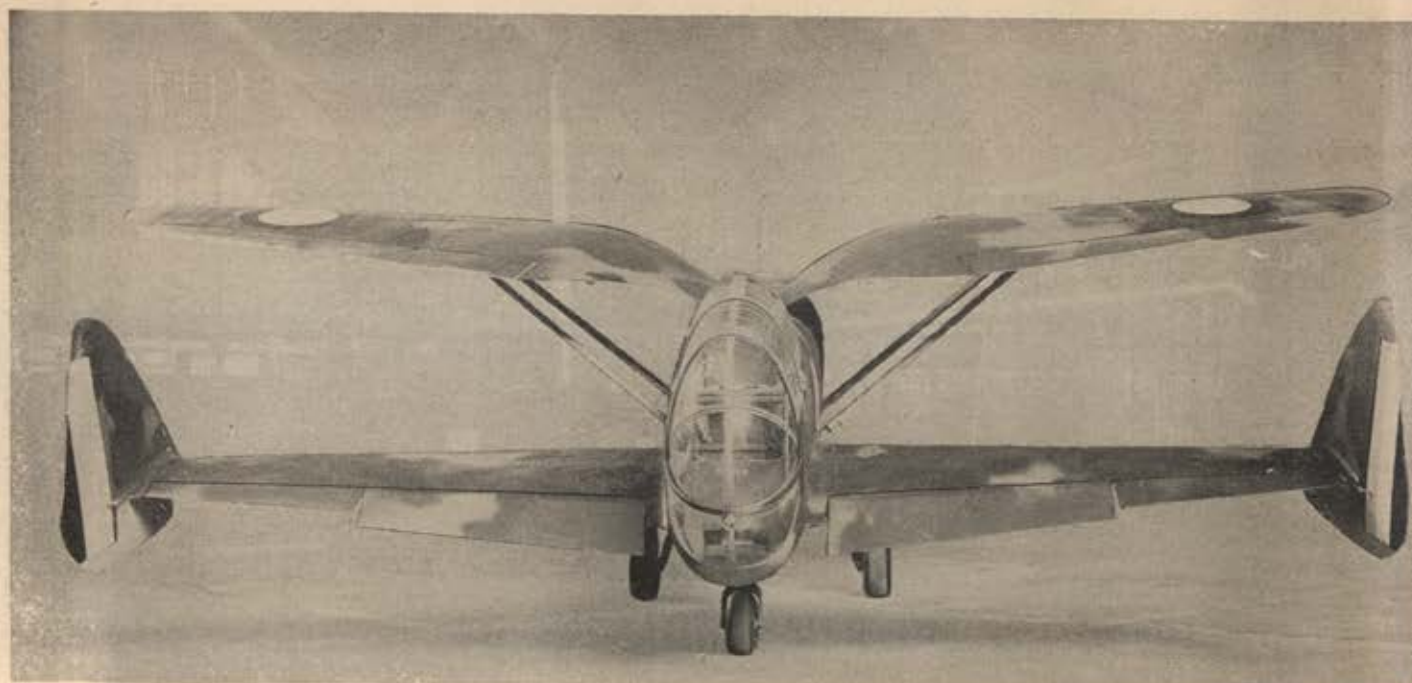
The Delanne craft showed its greatest advantage, however, in slow-speed flight and in landing. In conventional aircraft the mass center must be within around ten per cent of the center of gravity. This usually necessitates a long fuselage, a considerable part of which is unusable. In the Delanne theory designs a 67 per cent tolerance from the center of gravity is possible, which results in 100 per cent utilization of the fuselage space.

Future Possibilities

Before the fall of France, Maurice Delanne had plans for a medium bomber (diagram on page 49). It was to have been powered by 18-cylinder Gnome-Rhone engines in the 1,500-hp class. The craft was to have carried 5420 kilograms of bombs on three-hour missions. Division of the lifting surface into two cantilever units allowed a much shorter wingspan and stronger structures were available for the weight. Further, since ailerons were incorporated into both front and rear airfoils, activated by a single set of controls, the twisting effect of the single control unit was eliminated.

The 100 per cent utilization of the fuselage showed up well in the Delanne medium bomber. While the fixed for-

(Continued on page 65)



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Cleaner lines that cut your flying time and cut Flying COSTS



A 3-TIME RACING WINNER

Taylorcraft is the fastest light plane in the sky for its weight and horsepower—a 3-time winner of the Firestone Speed Trophy at Miami. No other light plane can claim this distinction!



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Please send my free copy of "This Is Taylorcraft."

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Mr. R. A. Miles

City _____

Wheelair Pusher

ENTERING the personal plane competition, Puget Pacific Planes, Inc., of Tacoma, Washington, recently announced plans for a pusher plane designated as the Wheelair 111-A.

Featuring roomy, automobile-type, fully upholstered seats, this new plane can carry three passengers in addition to the pilot along with 160 pounds of baggage. The Wheelair will have a maximum speed of 135 miles an hour, will cruise at 120 using only 75% of its power, and will be able to land at 55 miles an hour.

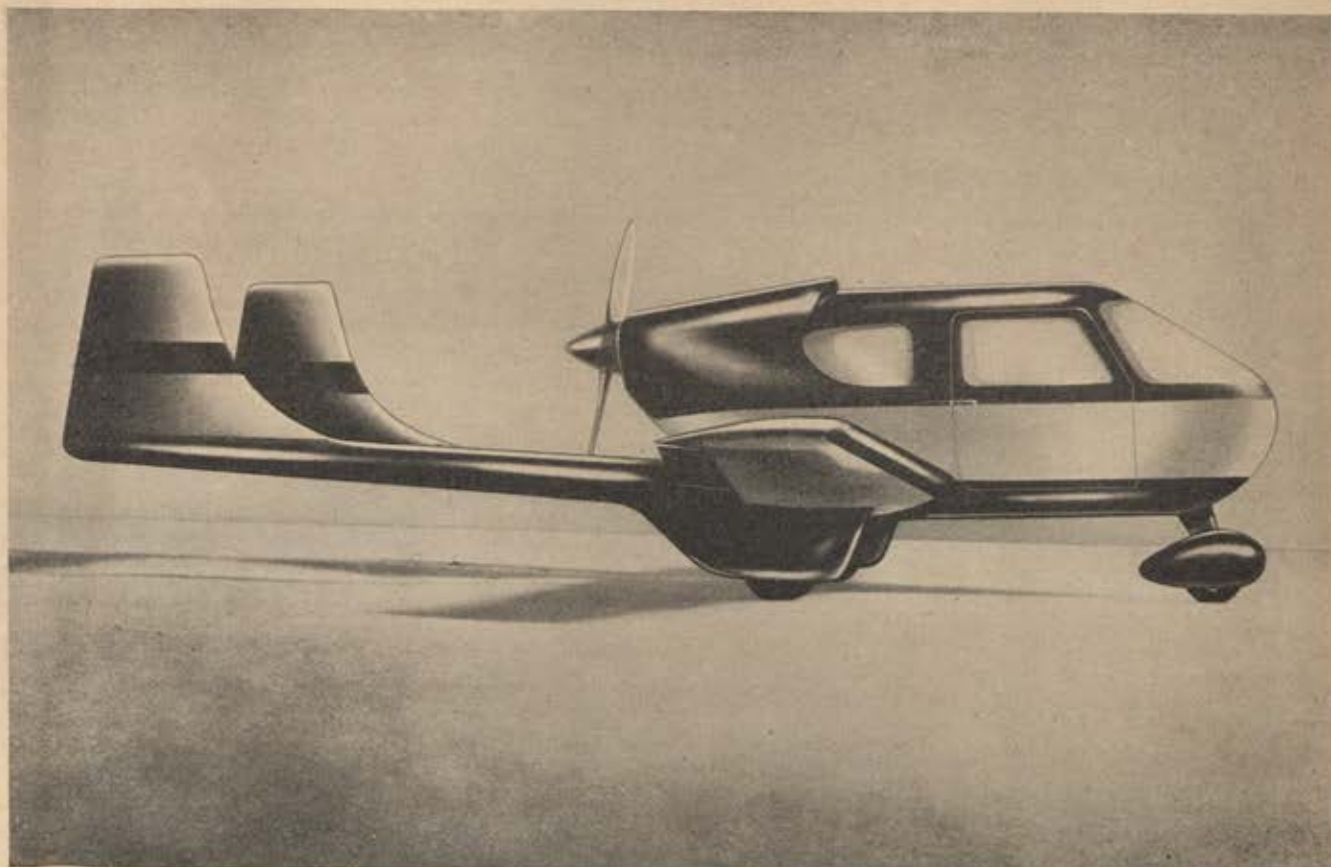
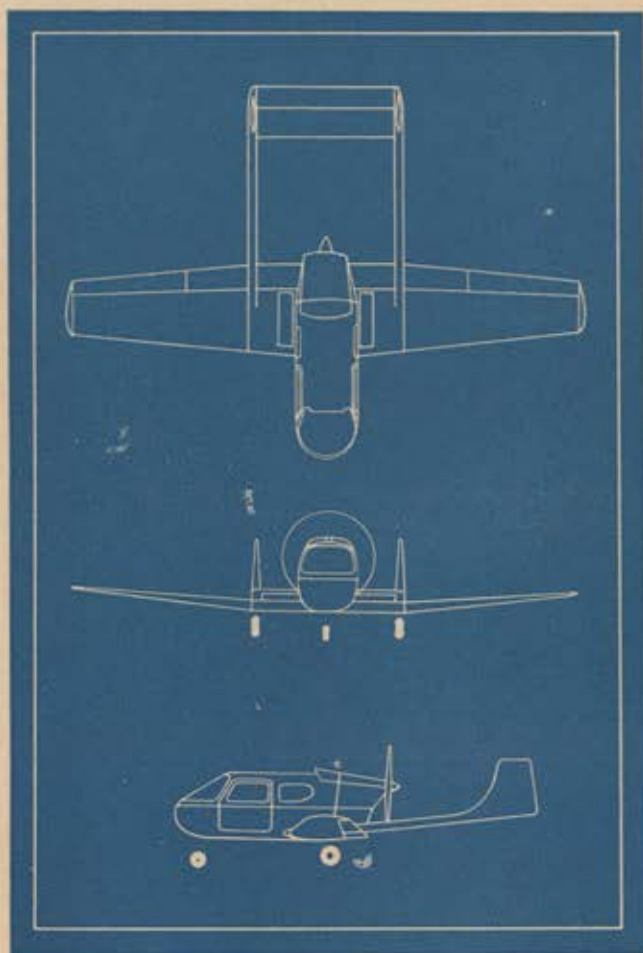
The 52-inch wide cabin offers considerable head and leg room and the adjustable front seats permit a change of position for both pilot and passengers.

A feature which pilots will appreciate is the excellent vision which the pusher design and the forward-placed cabin permit. In addition, passengers in the rear will have better visibility than usual in two-place low-wing planes.

The Wheelair will be powered with a Lycoming GO-290-AP four-cylinder air-cooled engine developing 170 horsepower for take-off with a normal rating of 160 hp.

Rich fabrics will feature the styling of the interior, with an easily read and smartly designed grouping of all flight and engine instruments. A spacious parcel compartment is located in the instrument panel and, if the owner wishes it, a two-way radio may be easily installed.

Fuel tanks with a 50-gallon capacity are located in the wing stubs away from the engine. Over-all length of the Wheelair is 26.62 feet and the wing span is 37 feet.



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THE CONNIES are coming

IN a matter of a few days the Lockheed Constellation will again be in the skies over such distant ports of call as London, Paris, Rio, The Hague, Honolulu, and Bermuda. In a week or so its big brother, the Constitution, will make its maiden flight from the Lockheed Terminal at Burbank. Having tasted the gall of bitter disappointment and the nectar of sweet accomplishment, both within a span of two months, Lockheed officials can well attest that the life of an aviation pioneer is not without its emotional extremes.

The precautionary grounding of the Constellation in July by the Civil Aeronautics Administration was a nuisance to the airlines and an inconvenience to

shorting. The other major changes called for the adoption of additional fire extinguisher protection in the rear section of the power plant, and the installation of improved exhaust collector rings. The bugs were typical. There was not a single change which, even by the wildest stretch of imagination, could be construed as indicating anything basically wrong with the ship. Lockheed and the Wright Aeronautical Corporation cooperated fully with the CAA in making the improvements, and now the Connie is again ready for flight. Both she and all transports of the future will be better craft for the experience.

In the meantime, the giant Lockheed Constitution has been made ready to



Largest plane ever acquired by Navy, Lockheed's 92-ton Constitution has 189-foot wingspan.

its passengers. But to give the incident broader implication than that connotes a lack of understanding of how the aviation industry in the U. S. has arrived at its present enviable position of world-wide preeminence.

Progress in aviation is made through a never-ending series of experiments, tests, and modifications. Without them the industry would stagnate. When the Constellation started airline service, it was one of the most thoroughly pre-tested, proven, and inherently safe airplanes to do so. It had the lowest stalling speed of any modern four-engined transport. It could climb fully loaded on any two engines. Innovations in control reduced pilot fatigue to a new minimum. It was subjected to every known laboratory test for safety and had passed with A-plus. But being a new plane, there were bugs. The industry has yet to produce a new ship without them. After the Reading crash, the CAA ordered Constellation operations temporarily suspended until certain modifications could be accomplished. The replacement of bulkhead electrical connectors with redesigned assembly and of aluminum conductors in generator circuits with copper cables was indicated, as was the insulation of circuit breakers to eliminate

take to the air. A 92-ton airplane with a capacity for 180 people, the Constitution was designed for the Navy, to meet its need for a large, land-based transport with high speed and extreme range to carry personnel and priority cargo across continents, oceans with great economy.

Advanced characteristics of the airplane include a wing design which will permit the introduction of gas turbine power for still greater speed and efficiency when this type of power is available. An innovation in the Constitution's design is the provision for "in-flight" maintenance of all four engines and most mechanical, electric, and hydraulic fittings. Man-size tunnels within the wings permit inspection and adjustment of engines and accessories. Landing gears, wheel and brake mechanisms are also easily accessible in flight.

The cabin is fully pressurized, sound-proofed, and well lighted. The ship's large galley is equipped to serve 300 hot meals on any flight.

Four Pratt & Whitney Wasp Major engines, totaling 12,000 hp, permit a useful load of almost 36 tons of passengers and cargo.

The upper deck seats 92 comfortably; the lower, divided amidships by the wing, holds 72 or 5405 cu. ft. of cargo.



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INTRODUCING THE HOCKADAY COMET

WHEN Noel R. Hockaday began thinking about the design of the recently announced Hockaday "Comet" a couple of years ago, he anticipated that post-war pilots would be interested in a happier combination of low initial cost and performance than most manufacturers were then predicting. Accordingly, he designed a ship along conventional lines to achieve the first interest, and through aerodynamic cleanliness has attained the second.

That the economy desired by personal flyers has been provided to a great degree is evidenced by the fact that the "Comet" will cruise at 125 miles an hour for 500 miles on its 24 gallons of gasoline. This is a fuel consumption rate of 6 gallons an hour, and roughly 20 miles to the gallon. The "Comet," which company spokesmen say will be in production by the time this analysis is read, has a top speed of 140 miles an hour, lands at 50, and climbs to 1,150 feet the first minute after takeoff. All performance figures have been verified after many hours of test flying and are attained with a fully loaded ship grossing 1,800 pounds. Weight empty is 1,236 pounds and the useful load of 564 pounds includes 100 pounds of baggage.

Two place side-by-side, the "Comet" has an outstand-

ing service ceiling—19,000 feet—which, combined with the rate of climb, makes it an ideal ship for operations involving high altitude airports. And because it is an honest, straightforward design, the "Comet" has excellent flight characteristics. Flight delays due to weather are minimized with the "Comet," since, when properly instrumented, the plane can fly over a lot of weather that would keep many light planes grounded. To the businessman who flies to keep an appointment; to the farmer who needs farm machinery parts or seeds urgently; or to the sportsman pilot—such performance means a lot.

Structurally, the "Comet" represents a combination of the best known methods of manufacture utilizing various modern aircraft materials. Wood, steel tubing, sheet metal and fabric—the old reliables—have been brought together judiciously and in some cases made to do new jobs. Except for fittings, tips and trailing edge, the wing is all wood made up of two laminated spars, mahogany plywood webbed full and nose ribs, solid capstrips, solid compression trusses, and spruce spanwise stringers. Steel tie rods brace the wing internally. The spruce leading edge is reinforced by 1/16-inch-thick mahogany-poplar plywood formed around the nose ribs to the spanwise stringer on both surfaces. Leading edge of the balanced aileron is





aluminum alloy sheet. Trailing edge of the wing is Kawneer tubing formed of 17ST alloy. Balance of the wing is C.A.A. Grade A fabric covered. Hinge supports and external strut fittings are made of X-4130 steel sheet. The NACA M-6 airfoil section is used.

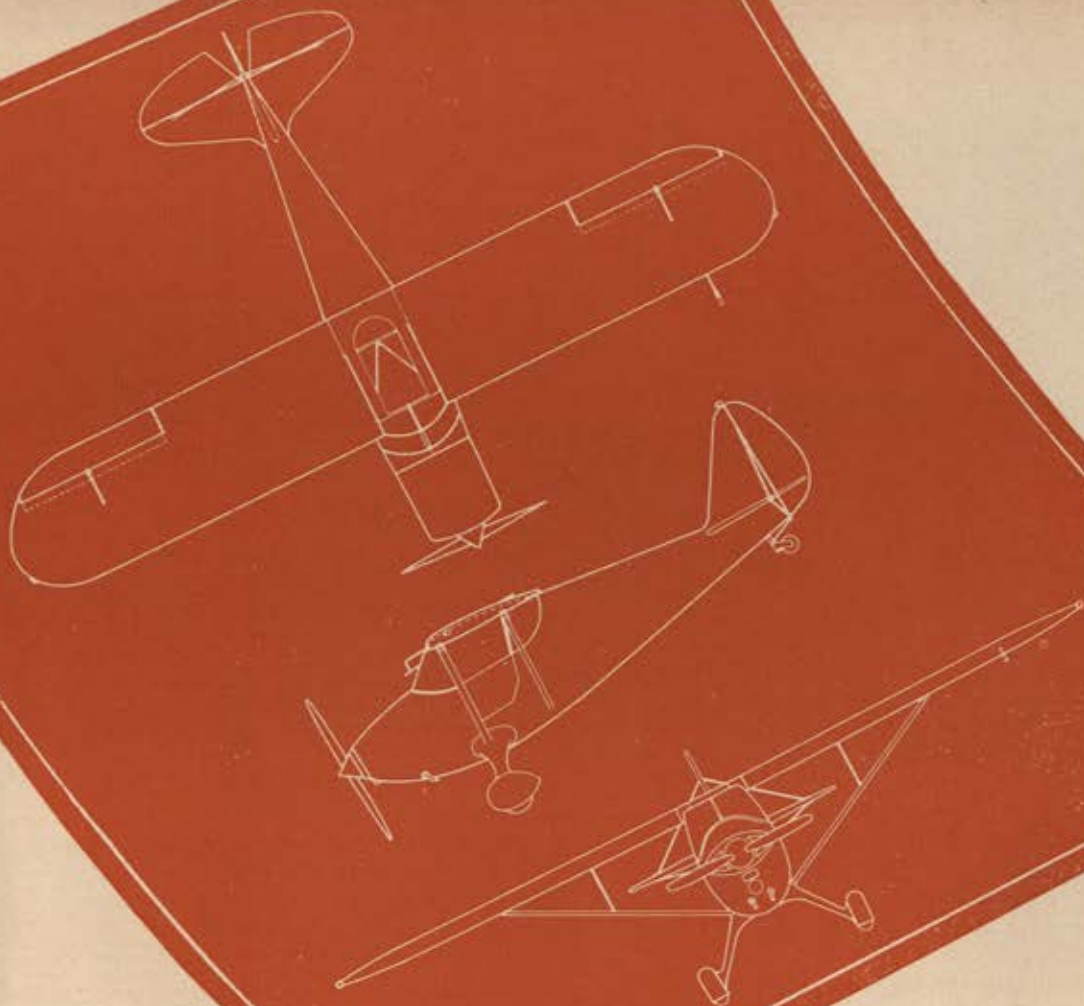
The basic fuselage structure is made of jig welded steel tubes. Longerons and uprights vary in diameter from $\frac{5}{8}$ to $\frac{7}{8}$ inches except for a few heavier compression struts and some lighter sub-frame members. Plywood formers and spruce stringers form a fairing assembly which is bolted to the top of the fuselage aft of the wing. Stringers attached to the fuselage sides further fair the basic structure.

The power-plant section forward of the firewall contains the engine, its accessories and air intake system. The stainless steel firewall is made in two pieces and attached

to the forward longerons. Built of steel tubes and removable at the firewall, the engine mount carries either a Continental or Franklin 125-horsepower engine on four sheer type fittings incorporated in the bearer tubes. The engine section is covered by a 4-piece metal cowl attached by Dzus fasteners permitting easy access for maintenance. Metal covering is continued to the aft mould line of the cabin door on either side and on the bottom. Balance of the fuselage, except for a metal forward tail fairing, is fabric covered.

Horizontal and vertical tail surfaces are non-balanced aerodynamically with frames of X-4130 steel tubing assembled by welding. Trim tabs are not fitted, but the horizontal stabilizer is adjustable in flight through screw mechanism operated from the cockpit by means of a series of cables and pulleys. The vertical fin is adjustable on the





Three-view drawing of the two-place Hockaday Comet CF-130, powered by a 125-hp Franklin engine.

ground. Fabric covered, the tail surfaces are bolted to fuselage fittings welded to the stern structure and wire braced externally.

Landing gear is the streamlined cantilever type, engineered on the "overload" principle to provide a husky structure for rough landings combined with a pillowing action to prevent bouncing. Brakes are simultaneous in operation. A steerable tail wheel is fitted.

Interior accommodations in the "Comet" cabin include full range ventilation, richly upholstered seats with cushions covered with cellular rubber and sufficient instruments set in a stylized rubber-mounted panel to meet basic C.A.A. requirements. They include: altimeter, airspeed indicator, tachometer, oil pressure indicator, magnetic compass, and electric fuel gage, ammeter, and capillary oil temperature indicator. Rudder pedals in the dual control system fitted are connected under the floor by torque tubes. Elevators and ailerons are cable operated by a dual wheel control mounted just below the instrument panel. Unusual feature is the straight-line pull of the wheels for elevator action, eliminating the binding associated with conventional installations. Lateral wheel forces are transmitted through a special chain system which in turn operates cable connected bell cranks. The co-pilot wheel can be quickly and easily removed if desired.

Access to the cabin is gained through two side doors, each of which is equipped with a large sliding window. Additional large transparent panels are located on either side behind the seats and an overhead skylight is included to provide rearward vision. The curved windshield consists of two pieces of formed Lucite attached to tubular bows and affords an extremely wide field of vision from normal sitting position. A baggage compartment 22 inches square and 19 inches deep is accessible from within the cabin.

Hockaday "Comet" electrical system is of the 12-volt D.C. type with a Delco-Remy 15-volt and 25 amperes capacity generator for power supply. A voltage regulator and reverse current relay combination is also provided. The starter and electrical system operates from a 12-volt 34-ampere-hour battery. Wiring and structural provisions are made in the basic airplane for installation of 2-way radio, complete navigation lights, landing lights, and heater.

At this writing a site for the "Comet" factory has not been decided on, although the company is confident first production models of the plane will roll off the line during the month of August. Factory price of the "Comet" with Continental C-125 engine is listed at \$3425.00, and with the Franklin 6A4-125-A3 engine, \$3550.00, less propeller.



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Now being flown by U. S. Navy pilots in an extensive test program, airplanes of the XBT2C-1 type incorporate major improvements on the best features of wartime carrier-based aircraft. Designed and built at the Curtiss-Wright Columbus, Ohio, plant which turned out more than 5,000 Helldiver dive

bombers for the Navy, this new plane combines high performance with extreme flexibility of usage for combat service.

A Wright Cyclone R3350 engine with two-speed supercharger supplies more than 2500 horsepower and the plane carries either a torpedo or a variety of heavy bombs or large aerial rockets. Fully loaded it weighs over 18,000 pounds, has a range of nearly 1500 miles and a speed fifty miles greater than planes of similar type which saw war service.



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(Continued from page 24)

tions now confronting charter operations. All of the operators know that fares can be reduced when planes specifically designed for semi-commercial use become available. Most of them realize that working agreements between charter operators can eliminate the "return-load" imponderables. They all know that military aviation has built a reservoir of trained pilots and mechanics. Unfortunately, none of the nonscheduled air services know exactly what to expect when, and if, the all-seeing CAB takes over. Some regulations are certain to come, however.

At the outset, charter operators will be required to register all of their planes and their personnel. On this count, no one can offer a bona fide complaint, for current CAA aircraft registrations are so completely out of date that they have no value whatsoever. Along with this regulation will almost certainly come a new type of pilot license, with standards somewhere between those affecting present commercial and airline licenses. And new licensing standards will eventually ground many of the planes now assigned to charter work, with full instrumentation a logical requirement for commercial operations of this nature.

Beyond these basic regulations, the outlook is still indefinite. Certain quarters insist that charter operators should meet financial responsibility standards, with minimum liability insurance requirements determined on a passenger-miles formula. Other observers would like to see twin-engine aircraft mandatory on nonscheduled as well as scheduled air services. A growing segment of the aviation industry wants registered charter tariff schedules as protection for certificated airlines along with "grand-

father" rights as protection for the charter companies which have pioneered in certain regions.

It would be difficult, at this time, to determine the future of charter service. Lacking capital, few of the small-plane operations can long compete with more affluent nonscheduled carriers who offer Douglas DC-3 and DC-4 comfort and speed to charter patrons. Without twin-engine safety, none of the present crop can continue to operate if the Civil Aeronautics Board decides upon one set of operation rules for all commercial air carriers. Lacking central organization, charter operators generally cannot make inter-line agreements which would bring two-way revenues at prices below 30¢ per mile. There is, however, one real hope for all of the nonscheduled air carriers directly and for the scheduled air carriers indirectly. That bright spot is the Institute of Air Transportation. Organized originally by a handful of operators using bases in the New York area, the new association now embraces more than fifty anywhere, anytime airlines. Seeking a standard set of safety and economic practices, a pooling or interchange of equipment, a return load agency, and decent ground facilities for nonscheduled airline passengers, this organization—or something like it—can alone take the charter operators out of the "tramp" class. The only alternative is rigid government regulation, assignment of routes, and economic dictation—which would annihilate all of the three hundred charter operations. If these charter operations pass from the picture, 80 per cent of the American people will lose the only commercial air service they have ever known.

OUT OF THE BLUE

(Continued from page 13)

The big point the management is going to sell is the airplane's utility. To this end flight demonstrations of new equipment will be held regularly. An attempt will be made to break the existing round-the-world record, and jet planes will seek to establish a new transcontinental speed record. In addition, forums in which military, governmental, and industrial leaders will participate will be arranged for reports on late developments which cannot actually be exhibited. In an effort to bring aviation close to where the individual lives, daily inbound flights from all corners of the earth will bring cargoes of strange and exotic commodities to be sold at the Show. The world's circumference will be diminished materially right before the spectators' eyes.

At this writing the list of exhibits and exhibitors is incomplete, but floor space in the huge hangar at Cleveland Municipal Airport has been partitioned to accommodate several hundred displays. Every facet of the aviation business including airlines, the Army, the Navy, helicopters, engine and accessory companies, Air Transport Association, the Air Force Association, and personal plane manufacturers will be represented. There will be displays of atomic energy and exhibits of machinery, fabrics, rubber and petroleum products. While classified as static in character, the National Aircraft Shows will not be static in manner of presentation and program. Vandeburg intends to stage the spectacle in a manner which will

combine the utmost in static exhibit and dramatic exposition in order to demonstrate rather than talk about the utility, safety, economy, mobility, security, and essentiality of aircraft.

The Show comes at a time when we have just learned that aircraft production is hitting new lows. At its wartime peak the industry was producing nearly 100,000 planes a year. For the full year of 1946 production will be around 1600 military and 3500 civil aircraft. The world's largest industry in 1944 has suddenly become the nation's sixteenth industry. In June the Army took delivery on 62 airplanes. In July the number was 67. Of these, three were bombers. Our military leaders have warned us of the dangers in dissipating our once-strong air arm—of allowing production to slow to a trickle. They are frank in admitting that our air force is in a far from healthy condition. The Commanding General of the Air Forces in Europe recently confessed of his own volition that it would take a matter of days to put a single fighter squadron in the air. Here in the U. S. General Spaatz, CG of the AAF, admitted on Air Force Day that it was a strain on the resources at his command to put a handful of planes in the air for a few local celebrations.

The situation will only be corrected when the general public fully appreciates the importance of aviation. It is things like the National Aircraft Show at Cleveland which will hasten that appreciation.



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Rendezvous

EDITOR'S NOTE: Beginning with the current issue of *AIR FORCE*, letters to the editors will be divided into two departments. Air Mail will concern itself with letters of general interest. *Rendezvous* henceforth will be a place where old friends can get together. If you're looking for a buddy who shared your foxhole on Kwajalein, address your inquiry here. This also goes if you've lost track of your old outfit, or if you're just throwing a party and want to use this column to invite the old gang. We are enlisting the aid of the War Department in this endeavor and should be able to get most of the answers for you.

Call for the 778th

Gentlemen:

Could you run a couple of lines in *Rendezvous* requesting former members of the 778th Bombardment Sq. (H) of the 464th Bb Gp (H) to contact me. Our squadron earned nine Bronze Battle Stars and two Presidential Citations in the ETO. As former Operations Chief of the Squadron I'd like to keep in contact with the old gang. I had to leave all my records behind when the outfit was broken up after V-E Day.

Harry Kaplan,
143 Liberty Street,
New York, N. Y.

Anybody Else?

Gentlemen:

The article appearing in the July issue of *AIR FORCE* entitled "Sea Squatters" interests me very much. I am eligible for membership in this organization, having twice been forced to ditch my plane at sea during my tenure in the Pacific Theater with the 13th Air Force. On one occasion seven of us were adrift for eleven days before washing ashore on a Jap-held island. If you have any information regarding this club, please send it to me.

1st Lt. H. B. Crothers,
Raleigh, N. C.

Gentlemen:

I recently read with interest the article on Sea Squatters in the July issue of *AIR FORCE*. I think I can qualify for membership, having experienced a ditching in the Adriatic Sea while on combat duty with the 15th Air Force in Italy. Can you give me the name and address of the individual or organization to whom I should address an inquiry?

Bert S. Taylor,
Knoxville, Tenn.

The letters from readers Crothers and Taylor are included in the *Rendezvous* column in the hope that they will encourage more Sea Squatters to get together. The process of making application is singularly uninvolved. A letter to the Sea Squatters Club in care of Walter Kidde & Co., Belleville, N. J., stating where you became a sea squatter and

how you escaped, will accomplish the purpose. No documentation is necessary.

Mr. Kidde reports that he stands ready to relinquish his station at the organization's helm as soon as an election of permanent officers can be held.

Gentlemen:

Prior to transfer to the AAF I served with the RCAF. Now a group of former FCAF members are trying to reach all Americans who served in the RCAF prior to January of 1943. The idea is to reestablish friendships and possibly work up a reunion.

If they reach enough former members, I have agreed to publish a small bulletin containing the names and present addresses of all. Copies of the bulletin will be sent to all who inquire, thus enabling the members to contact former buddies. This is not a commercial matter and no obligations will be entailed for anyone. I would like each one to include a three-cent stamp when sending in his name so I can send the bulletin without postage cost to myself.

John L. Scherer,
Editor, *Aero Review*,
Penn Yan, N. Y.

Tenacity Plus

Gentlemen:

Some of the boys from the 422d Bomb. Sq., 305th Gp., might like to hear that one of their pilots, former 1st Lt. Perry Schreffler, is giving civilians a firsthand example of AAF determination right here in Los Angeles.

Schreffler, who made up his mind when he was 14 that he was going to be an airline and test pilot, soloed at 16. He spent 42 months in the AAF, flying B-17s in the ETO with the 422d, and in the ATC in Memphis, ferrying C-47s to New Guinea. He has the Air Medal with two clusters and the ETO ribbon with four stars.

When he got out, Perry got a job ferrying 14 planes from Los Angeles to the new Oakland plant of Aero Industries Technical Institute where he will start studying airline maintenance and aeronautical engineering when it opens in September. Then he got a truck driver's license and stayed right on with the company, doing everything from driving trucks and ferrying planes to mowing lawns, cleaning grease spots.

He'll have his instructor's license by the time the school opens, so while he's going to school he will earn his way by flight instruction as well.

The guy is only 23 and has a wife and two-year-old boy. If anyone's going to stop him from becoming what he wants to be, they're going to have a pretty good-sized job on their hands.

Incidentally, thanks for the *Rendezvous* section. It's doing a swell job.

Michael J. Linehan, Capt. ORC,
Los Angeles, California.

DOUBLE MONOPLANE

(Continued from page 52)

ward armament followed conventional setup of the period, the rearward installations showed a radical departure.

The main turret, an electrically operated unit, was aft of the main wing atop the fuselage. It consisted of a long-barreled 37mm cannon augmented by two 12.7 heavy machine guns. In the rear cone of the fuselage, protruding aft of the rear plane, was a four-gun 90° azimuth-arc turret mounting 50-caliber guns. This type 150 B-4 indicated it would achieve a top speed over 400 mph.

Designer Delanne is now in the United States and is planning production of either military or civil versions of his design. One of the most interesting is a twin-engined four-place craft suitable for opposed-four or four-in-line installation. On the other side of the scale is a conventional-class continental transport in the DC-3, C-46 class. It has a span of only 65 feet, 4 inches for the main wing and is powered by only two 1,560-hp 18-cylinder radials. Delanne warrants that the design will carry over 24 passengers and adequate cargo, mail and express for profitable operation, at a top speed of 350 mph and a landing speed of no more than 55 mph at sea level.

In the same general class Delanne has a tail-powered transport, much like the Douglas XB-42 or Mixmaster. In this design the Delanne system's great tolerance in distribution of load becomes effective. Because the load can be moved over 60 per cent of the distance away from the center of gravity and still keep an inherently stable airplane, the ship's power plants themselves can be located in the rear of the fuselage, eliminating the need for the long under-floor drive shaft used in the XB-42. In Delanne's design two engines feed power into a unit twin head, thence to the gear box of a six-bladed co-axial contraprop.

Eying the future, Delanne has proposed a seven-place jet-powered light transport, powered with an axial-flow engine of his own design. During his period of operation under Nazi "direction," Delanne had access to data on their axial flow engine development. It was not detailed information, but it was sufficient for the imaginative Frenchman to pick out a few of its obvious flaws. Among the things that he "considered" during his three years of incarceration was a series of logical changes in the theory. While the engine which Delanne proposes outwardly resembles any other axial flow unit, it incorporates alterations in both the compressor and turbine stages. The designer believes that it will result in lower operating temperatures at the jet end, and greater fuel economy than has been possible up to now.

An interesting looking craft, it will incorporate probably the first jet engine designed exclusively for commercial use. The wide range between cruising and landing speeds in previous double monoplanes indicates that handling characteristics of this design would make it an entirely practical operational design, despite the unprecedented speed for charter-private-light transport which it offers. In line with Air Commodore Frank Whittle's idea, the Delanne 220 designs power-plant and airframe as a single project, rather than building airframe for the engine or the other way around. What will the type's cruising speed be? M. Delanne stroked his neatly-trimmed greying beard—"First we fly him—then we see!"



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ROSCOE TURNER

(Continued from page 28)

In 1938 Turner made up for the setbacks with a vengeance. Riding his new Turner-Laird monoplane at the National Air Races in Cleveland, he took the Thompson and Ludlum trophies, and established a new world's closed course record of 293.119 mph.

Payoff year was 1939, for at the National Air Races, Turner took the coveted Thompson Trophy for the third time, averaging 282.53 mph for the course. During the qualifying run, the Turner-Laird was clocked at 299.003. That was enough. Turner topped the year off by receiving the Harmon Trophy for the second time. He was in his middle forties, and the business of taking winged meteors around a close course was a job for kids. Turner doffed the robin's-egg blue uniform that for years had been his trade mark, and took on the serious job of management.

There was talk of Turner's going back to racing. Maybe being tied down to a desk palled a little. The Roscoe Turner Aeronautical Corporation, founded after his retirement from racing, was a full-time job. Added to that were the industrial problems of the "little guy" in the aviation business. Maybe the old racer's cockpit was more comfortable than the swivel chair. A couple of automobiles put an end to that thinking, when an Indianapolis motorist drove through a light at an intersection, crashing into Turner's car. While Turner's trained physique healed the broken pelvis, the last of the racing fever went with the injury.

Turner's part as President of the National Aviation Training Association—holding the corner for independent flying—is history. Through his school, part of his skill has been passed on to men who have forged the current victory. Futures—ask Turner—he'll probably start out—"Well now I've got an idea. . . ."

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