

# AIR FORCE

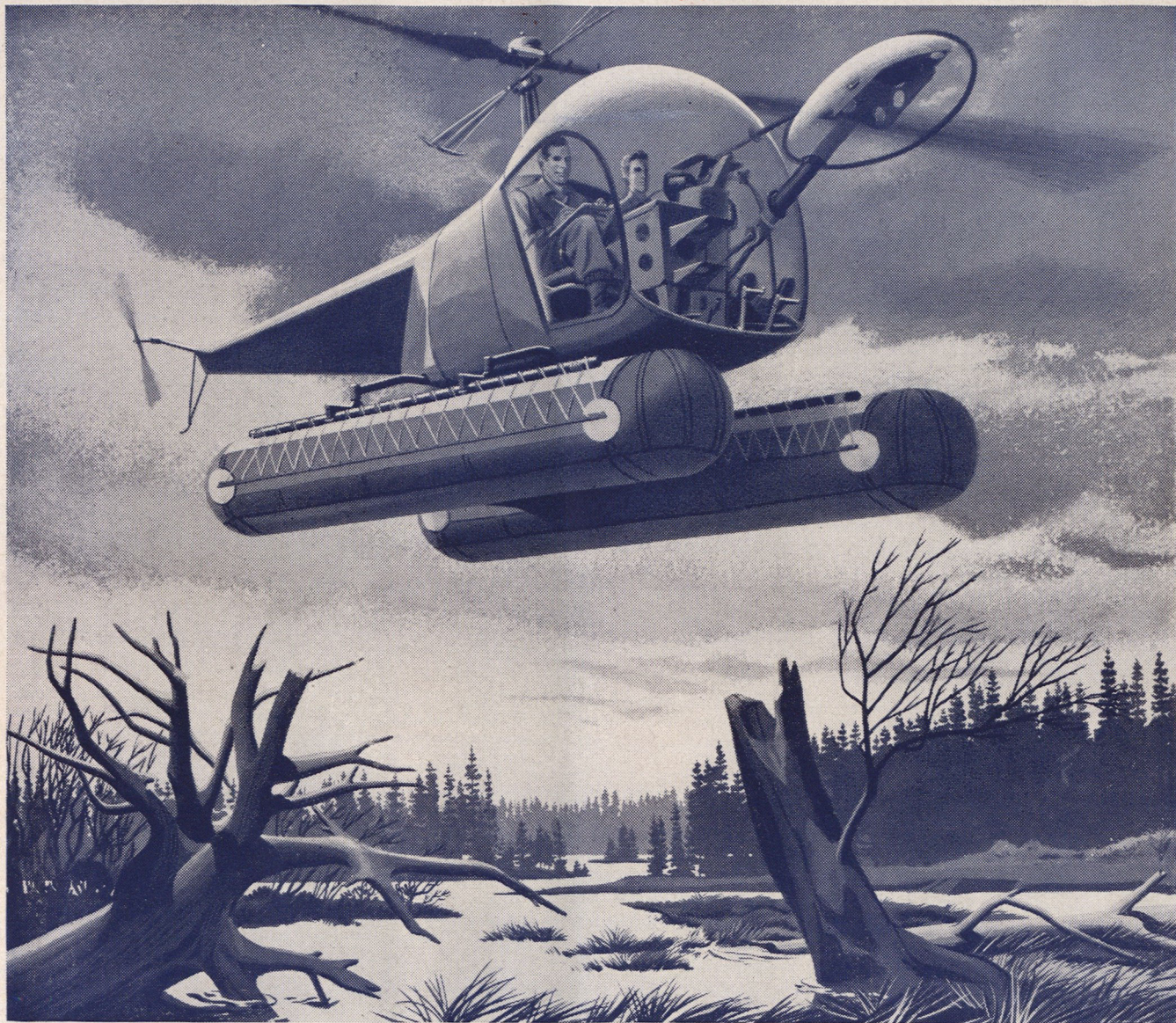
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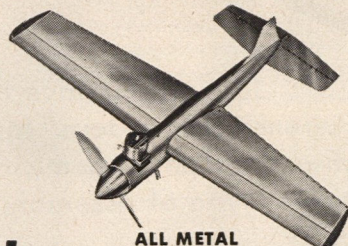
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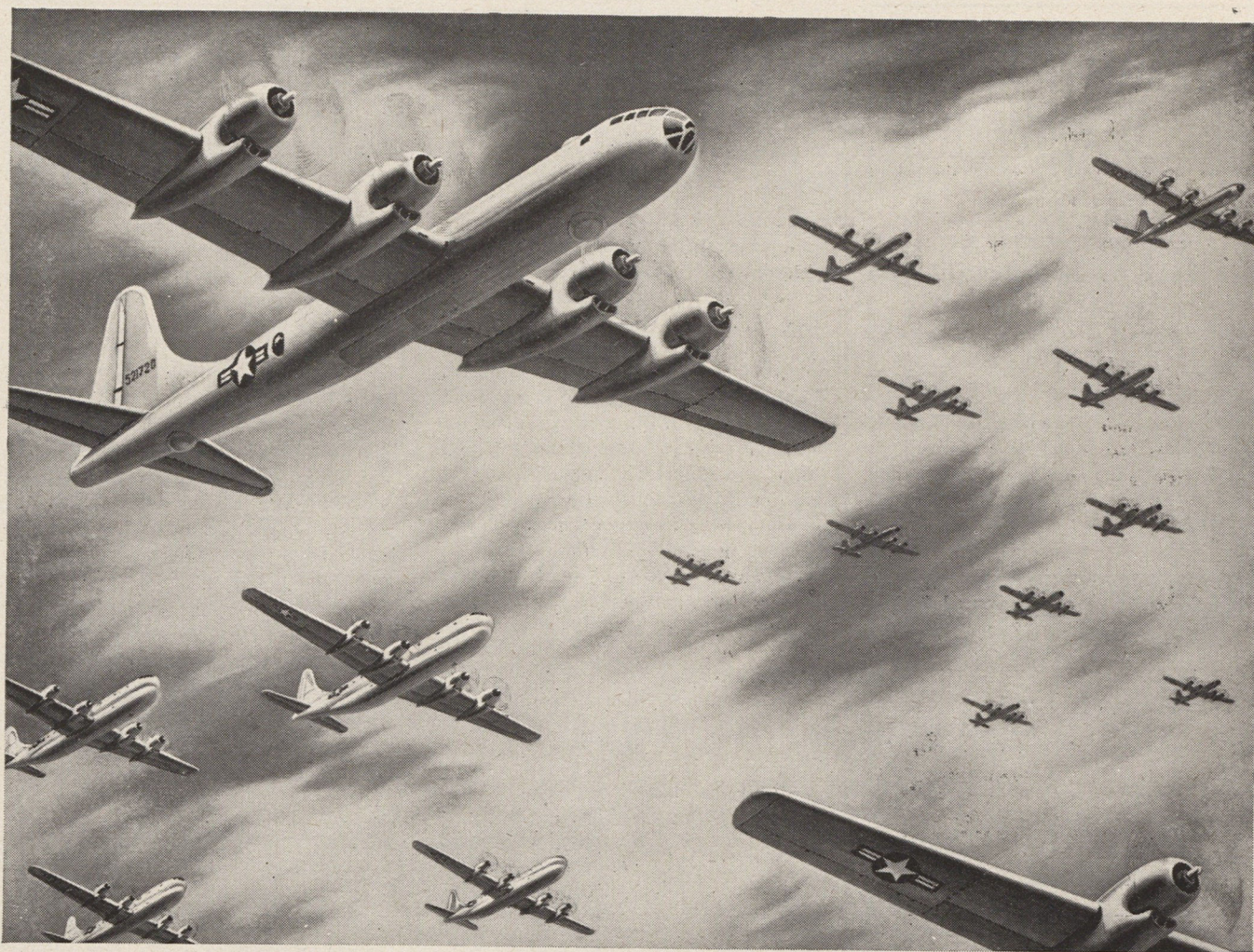
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# Air Mail

## Now We're Hep

Gentlemen:

In the article "The Melody Lingers On," the author stated that "once in Nuremberg Stadium, Miller and his crew played for two frenzied hours before 40,000 GI's."

I would like to know how this is possible. Major Miller was lost in December of 1944. In March '45, as a prisoner of war, I was in Nuremberg which was still very much occupied by the Germans and as far as I know remained in German hands until early April.

Obviously this sort of schedule doesn't jibe, as it would put Maj. Miller, his band and 40,000 GI's in Nuremberg at least four months prior to its capture. A stunt I'm sure the Jerries wouldn't allow even if they were converted to "Hep-catism."

Sam Berger  
317 E. 178 St.  
New York, N. Y.

*Partly the author's fault and our own for "not being there" when this error came through. The sentence should read "Miller's crew played for two hours, etc." The appearance was actually after Miller's death.*

## Technical Stress

Gentlemen:

Your issue of February, 1947 contains a very interesting article by Professor Barton Leach, Colonel, A.C. Reserve, entitled "The Bear Has Wings." I believe it would be very desirable to give serious consideration to the inclusion of more articles of this nature in the magazine.

There appears to be a tendency to overstress technical flying angles in AIR FORCE. Although former members of the Air Force wish to keep abreast of developments in the technological field of flying, there are, however, many who are interested in the much broader field of aviation, as for example, the Professor Leach article.

George S. Robinson  
Lt. Col., AC Res.  
19 Edgewood Terrace  
Alexandria, Virginia

## Bless 'em All

Gentlemen:

I have read and enjoyed every story and article in AIR FORCE which I think is the best informed and finest of all aviation publications, but in the May

issue I read a caption that brought tears of frustration to my eyes. It read: "had Hitler not insisted on using it (the ME262) as a vengeance weapon against England and allowed its use against B-17s, the war's course might have been changed" . . . intimating that 17s were our only offensive weapon. Shame!

What I, and other "Lib" crewmen would like to see in future issues of AIR FORCE are some statistics on: comparative number of 17s and 24s in operation by USSTAF on VE Day: number of missions per average airplane before being WW'd: comparative bombing capacity on long range missions: average operational airspeed: comparative loaded range: percentages of losses to number of missions flown: and any other comparisons between these two airplanes that could decide which, if either was, the "Queen"?

R. E. Robinson  
701 S. High St.  
Neosho, Mo.

*We regret reader Robinson's "tears of frustration" but it is our opinion that the "Libs" war record has, in no ways, been discredited. We intend to do an article on the B-24 in our "Great Planes of the War" series in a forthcoming issue of AIR FORCE.*

## Parachute Predicament

Gentlemen:

I remember in the AAF Review there was a space set aside for lost or misplaced parachutes. I was wondering if AIR FORCE could help me locate a parachute which I misplaced as an officer on flying status. It was a back-type, No. 42-1043530. When I was discharged I had to pay \$158 for it.

I'm almost positive the parachute is still in use somewhere in the Air Forces. but just where, I don't know. I was stationed at Lowry Field, Denver, Colorado when it was lost on June 21, 1945.

M/Sgt. J. R. Thompson  
RA-18216425  
8th AAF BU (Flying Safety)  
Langley Field, Va.

*Because we have not had a sufficient number of inquiries, the "Parachutes Lost" block which appeared in the AAF Review was not reinstated in AIR FORCE. However, this department will be inserted in the future if there are enough inquiries to fill it.*





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# This Month

## The Cover

Within a few weeks now, the AAF's first P-84 jet fighter group at Bangor, Maine will be fully equipped and ready to go to work on an operational basis. Counting the P-80 units already activated, this will bring the total jet groups in continental US to four. Add to this the unannounced outfits overseas, and there is substantial evidence that in spite of budgetary limitations the AAF is doing its level best to prepare for tomorrow's war with something a little better than yesterday's weapons.

The Republic P-84 Thunderjet pictured on the cover is the brain child of Alexander Kartveli, who also created the war-famed P-47 Thunderbolt. The jet was conceived in 1944 when Matériel Command wanted Republic to rebuild a P-47 to do test flights on General Electric's TG-180 jet engine. Kartveli indicated that it would actually be easier to design a new airplane, and so contracts were let for the prototype.

What emerged was a low mid-wing monoplane with a wingspan of thirty-six feet and an over-all length greater than its span, thirty-seven feet three inches. The air intake is through the nose, not unlike the original British Gloster prototype. This allows a straight-through flow of air under the cockpit to the J-35 eleven stage axial flow engine. The fuselage is a comparatively simple structure, fully flush riveted. Even antenna masts and armament are internally installed to minimize excrescences.

Earlier this year, prototype P-84s tried for the world's speed record, held by Britain's Gloster Meteor. While it failed to record an official new mark, it did create a new American speed record, and unofficially topped the existing British record of the 616 mph by clocking 617.8 mph. On another flight, a speed of 621 mph was recorded.

## Testament to Testament

As a literary critic John Dos Passos is a hard man to please. This is probably so because every writer has a natural tendency to judge every other writer by his own standards, and since Dos Passos has few peers it is quite understandable that his literary nose should be in the air a good part of the time. But of *Purple Testament*, which wasn't even written by professional writers (page 27) Dos Passos has this to say: "If a foreigner should ask me what Americans were like in 1946, I would hand him this book. Naturally it's not the whole story. It is only the story of a fairly small

group of young men among those most hurt in body and mind by the accidents of war. But somehow, in putting down the war experiences that affected them most, these young men have uncovered a much larger segment of the reality of our time than they themselves seem to have been aware of.

"Some of the sketches have patches of good writing in them, some of them are not well written at all, but it is hard to read them with dry eyes and without a feeling of bitter remorse that we have accomplished so little in our time toward building a nation fit for these sons and brothers and sisters of ours to give their lives for. These are things we must not forget. As you read sketch after sketch, and I for one couldn't put them down, the individual stories merge into one story. What you are reading is the life of which all our lives are a part, the story of man in our time."

## Air Force Day

The Army Air Forces, observing the Fortieth anniversary of its existence on August 1, 1947, has, in the year since its anniversary, made considerable strides in aeronautical development. The past year has seen the debut of the AAF's first supersonic research plane, of a super-bomber capable of a 10,000-mile flight, and of a fleet of jet-propelled bombers which can fly faster than World War II fighters and farther than World War II heavy bombers.

First development of the past year was the Consolidated-Vultee XB-36, the world's largest land-based bomber, which made its maiden flight on August 8, 1946, at Fort Worth, Texas.

In December, 1946, came the most sensational of the year's aeronautical developments, the Bell XS-1. The XS-1, a supersonic research plane designed to fly at a top speed of 1,700 miles per hour at 80,000 feet, made its first test flight at Muroc, California, Army Air Base, on December 8, remaining aloft for 19 minutes.

On January 14, 1947, the AAF announced the existence of the world's largest land-based plane—the Consolidated-Vultee XC-99, cargo version of the XB-36. The XC-99, a double-decked counterpart of the giant superbomber, has the same wing span, 230 feet, but is slightly longer, with a fuselage length of 182½ feet. The XC-99 is expected to fly in the autumn or early winter of 1947. The Boeing L-15 "Flying Jeep" was announced just five days later.

On February 9, the AAF announced that the Northrop YB-49 was nearing completion. The YB-49 is a jet-propelled version of Northrop's XB-35 "Flying Wing." The Boeing C-97 "Strato-freighter" successfully completed its first test flight at Seattle, Washington, on March 11, remaining aloft for thirty-seven minutes.

The first of two four-jet bombers, the North American XB-45, completed its maiden flight on March 18. The XB-45, powered by four GE-Allison J-35 jet engines, is a high-speed medium bomber capable of over 480 miles per hour.

Just two weeks later, on April 2, the Consolidated-Vultee, XB-46, second of the four-jet bombers, took off from Lindbergh Field, San Diego, California, and landed one hour and thirty-seven minutes later at Muroc Army Air Base. The XB-46, also powered by four J-35 engines, has an exceptionally long fuselage, 106 feet from nose to tail, and a wing span of 113 feet. Like the XB-45, it is capable of speeds in excess of 480 miles per hour.

On April 15, the AAF announced a successor to the XS-1, the Bell XS-2. The XS-2, also a supersonic research plane, will employ a sweptback wing instead of the conventional type on the XS-1, and will have a stainless steel body.







## "We Believe . . ."

**W**E BELIEVE that America's chief hope for defense against attack from the outside, for the maintenance of her sovereignty, and for the retention of the principles on which the nation was founded and has flourished, require in this air age the maintenance of a powerful air force, constantly renewed and modernized by the nation's industrial and scientific strength.

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- A UNIFIED AMERICAN MILITARY FORCE, with separate Land, Sea and Air arms
- A POWERFUL AIR FORCE, as the best defense in this air age
- A STRONG RESERVE ESTABLISHMENT
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- A CONSTANT AND INTENSIVE PROGRAM OF RESEARCH AND DEVELOPMENT

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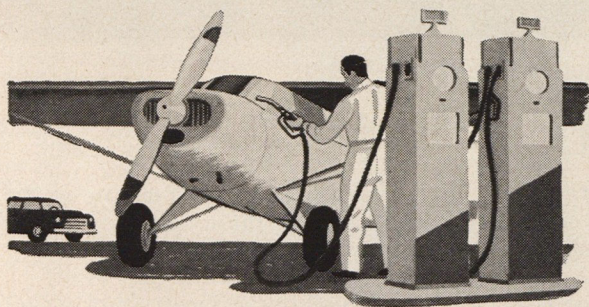
STANDARD OF CALIFORNIA'S

# PLANE FAX



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

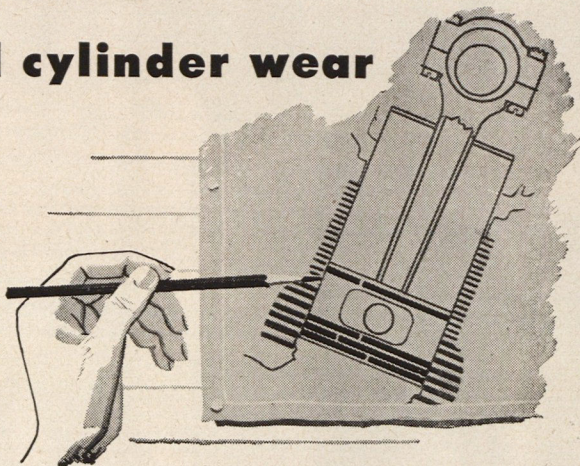
## Use of automotive fuels in aircraft hazardous



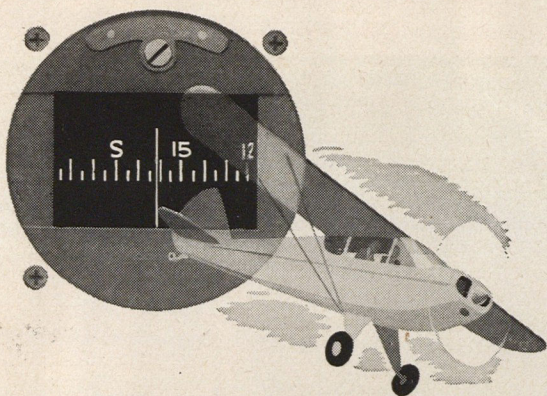
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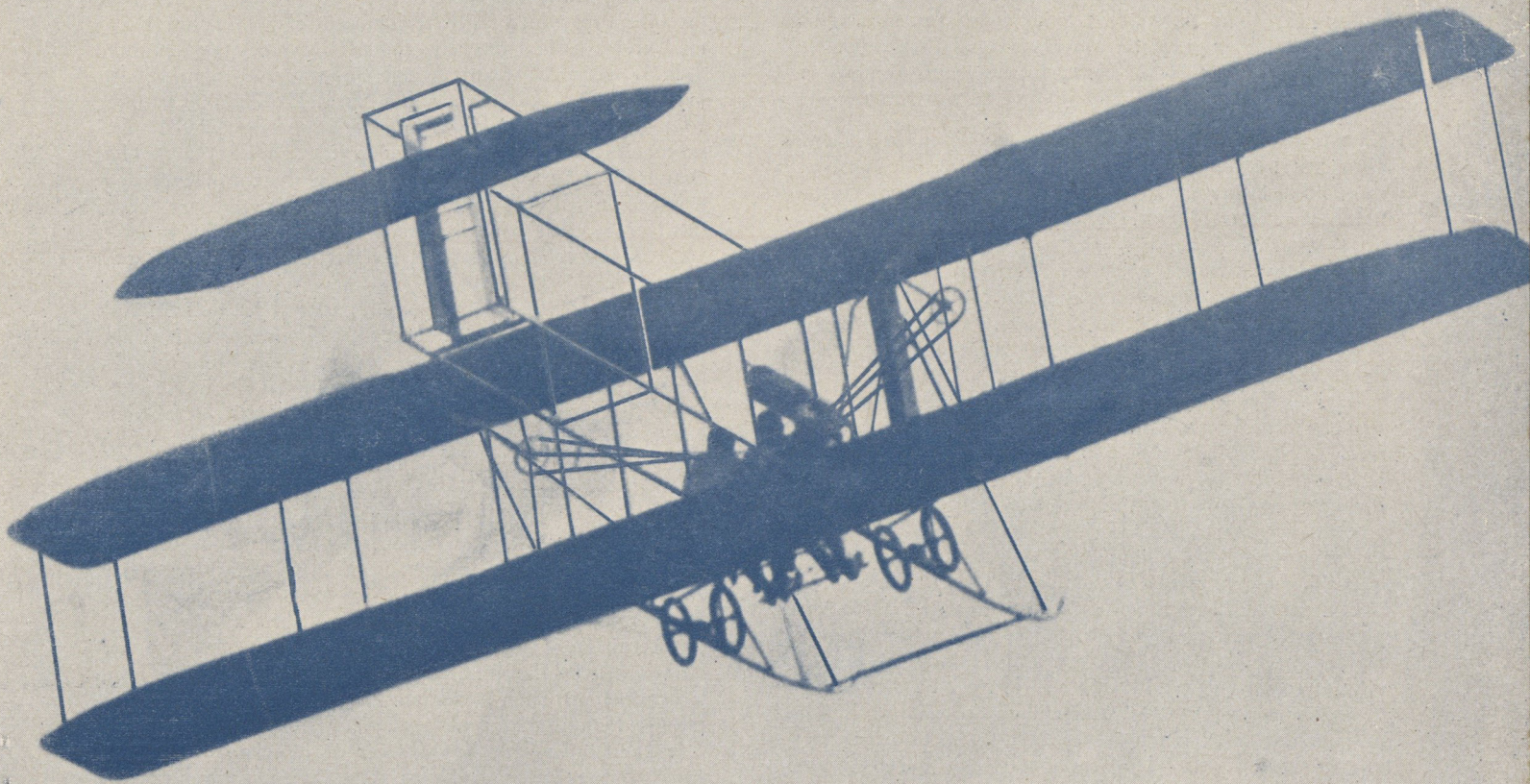
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# AIR FORCE

July, 1947



## Third Rate Airpower

JULY, 1947





# Third Rate Airpower

BY SENATOR OWEN BREWSTER

*Senator Brewster, Republican of Maine, is a staunch advocate of adequate air power. In recent months he has carried a message of the plight of US air power to many groups throughout the nation and has challenged Congress to take action at this session. AIR FORCE here presents excerpts from the Senator's thoughtful presentation of the situation.*

**I** WISH it were possible to speak in terms of limitless horizons, to describe proudly a continuing American leadership in the field of aviation which we so largely pioneered. Unfortunately, I am unable to do that. The facts as they stand would not support it.

The United States is no longer the world's leading air power nation. Many of you may be shocked to know that we are running a poor third. In practically every branch of air power, Britain and Russia surpass us. Important new evidence has come to light recently to substantiate this.

The first new and startling evidence was an article by William Courtney in a recent issue of *Collier's* weekly magazine. Courtney states that Russia, far from demobilizing her air power since V-J Day, has expanded it in all its branches—including her manufacturing industry and airlines. Courtney reports that Soviet aircraft factories will produce 100,000 planes, military and civilian, in 1947. This is approximately four times our probable production in 1947.

Courtney declares that Russia, turning out 200 transport planes a month in 1944, is now producing 360 transport planes a month. The American aircraft industry produced only 467 transport planes in all of 1946. The total will not be much larger—in 1947. Russia had only a few hundred miles of scheduled airways several years ago, Courtney says—but now she operates 50,000 miles and plans 150,000 airways miles during the next few years.

The article is packed with amazing data on Russian Air Power. It tells about expansion of aviation in the Satellite countries. It asserts that the Soviet air force is now twice as strong as in early 1945, and that the ratio of fighters to long-range bombers has been changed to provide a great many more long-range bombers.

Courtney's figures are his own, and he does not reveal his sources. However, Courtney's analysis of expanding Russian civil and military aviation is borne out by evidence from other sources.

We know that Russia has established weather bases in the Arctic. We have heard Radio Moscow announce their policy of becoming the world's strongest air power.

That is a policy firmly established at the top and forced, nationally, from the Politburo down to the peasant.

Britain is the other great air power.

Although England is withdrawing from India and is turning the role of policeman in Greece and Turkey over to us, she is maintaining a powerful air arm. The RAF budget for 1947-8 provides for 370,000 officers and men. This is an air force larger than our own Army Air Forces, under the President's budget submitted in January.

Another bit of testimony can be given you by a quotation from a recent issue of the authoritative British magazine, "Flight," March 13. I quote:

"That the Royal Air Force had become our front line of

defense in the recent war is no longer denied. Consequently the nation must be prepared to pay the premium exacted for the insurance which the RAF represents. In the White Paper on Defense issued recently, the net estimates for the three fighting services were: Army, 388,000,000 pounds; Air Force, 214,000,000 pounds; and Navy, 196,700,000 pounds. *That the RAF should be so far above the Navy in its allocation is an indication of how the defense picture has changed during the last few years. One doubts that the general public fully realizes the fact. The amount by which this year's Air Estimates exceed the Navy Estimates is as great as the total of the Air Estimates some ten or twelve years ago.*"

The *New York Times* reported, on April 22, that Britain's first jet-airliner has had a successful flight test. Britain also has at least two jet fighters in large production—and they are superior to ours—for immediate operational duty.

We have thus seen impressive evidence that Britain and Russia are determined to stay ahead in the air. Let's quickly look over the situation in this country.

First, the airlines. They experienced a substantial increase in traffic last year. But because of a great many problems of conversion and reconversion, the domestic airlines operated at a loss in 1946 of more than \$7,000,000. Of the airlines that have reported so far for 1946 operations, eleven ran at a loss, while nine earned a small profit.

The airlines' most pressing difficulties have been temporarily eased by the seasonal upsurge in traffic. Serious long-term problems, such as adequate traffic control for a greatly increased number of highspeed planes, the research and development of facilities for all-weather flying necessary to insure maintenance of schedules, these and other problems are as challenging as ever.

General Eisenhower, General MacArthur, all authorities, have warned us that armies of the future will move almost entirely by air. Provision should be made for maintaining as large a part of the needed reservoir of civil air transports as is economical and efficient. Our policy with regard to commercial aviation should be established by law.

## Aircraft Manufacturing

The situation with regard to the aircraft manufacturing industry is even more alarming.

Eight of the twelve largest aircraft manufacturing companies operated at a loss in 1946. Their profit of more than \$60,000,000 in 1945 was changed to a loss of more than \$8,000,000 for last year. That aggregate loss for the twelve companies was after taking full advantage of all tax carry-backs available to those companies. Contrast this record with that of industry in general. The National City Bank of New York recently reported that net income of all manufacturing corporations in the country increased by 36% from 1945 to 1946. The same report showed that net income of aircraft companies decreased by 95% from 1945 to 1946.

And what about the future? In 1947 and in early 1948 the industry will deliver a substantial number of new high-speed transports equipped with the latest and most improved devices making for maximum in safety and passenger comfort. These new planes will be more than 50% faster than



planes now in service. When this greater speed is added to the 50% increase in available seats contained in the new planes, it can be seen readily that the airlines by early next year will be completely re-equipped. There will be only limited re-ordering by the airlines until the problem of all-weather flying is solved, and until present planes wear out, processes that will take some years to come about.

In the field of military production, the official Air Coordinating Committee has stated that in the interests of national safety we should maintain a manufacturing industry producing at least 3,000 military planes every year—"after maintenance of world peace was well assured." This production, according to the committee, should be in addition to a reasonable output of commercial and personal aircraft. Actual production last year was 1330 military planes and 467 transport planes, figures which contrast most strikingly with those reported for Russia by William Courtney. Clearly our industry is not being maintained at the levels recommended by official administrative agencies; and just as obviously, our failure to do so is a risky and hazardous business. After the last war we also neglected to maintain an aircraft industry, and the seventeen firms established in the business during World War I dropped down to three by 1926.

It was about that time that General Billy Mitchell charged the armed services with being guilty of treasonable neglect of air power. President Coolidge moved promptly in response to that charge and established the Morrow Board, which was organized in September, 1925, and which completed an exhaustive survey and filed its report by the year end. Its recommendations were embodied in the following year in the Air Corps Act, the Naval Air Corps Act, and the Civil Air Commerce Act, all of which were signed by President Coolidge in 1926. This legislation, which constituted the Magna Carta of air power, kept American aviation alive during the following years, indeed gave us ascendancy in most branches of aviation for almost a decade.

Then, once again we began to neglect aviation and air power, ignoring the warnings of the Morrow Board. That neglect hit a nadir in 1934 and 1935, when appropriations for the Air Corps and the Bureau of Aeronautics reached a ten-year low. That neglect at a time when Hitler and Mussolini were on the march was of course a major reason why those aggressors started on their march.

A spot check of other branches of aviation reveals the existence of serious problems in those fields too. Production of personal aircraft has fallen from last summer's 4,600 a month to the current level of around 1,700 a month. Numerous reasons are given for this abrupt contraction, including lack of landing facilities, cost of the aircraft and the expense of operation, and others. We lack the time here to examine reasons or analyze the situation, but the existence of serious problems is clearly indicated.

Thus, it is that no matter which branch of air power we examine; air transport, air manufacturing, the size of the air forces, research, personal aircraft, and helicopters, challenging problems involving national and local government policy bar the path of progress. Does all this mean that the brilliant promise of aviation and air power is not to be fulfilled? Are we to be denied the thousands of new jobs, the new enterprises springing up around the airports, the convenience and luxuries that aviation seemed likely to bring us?

I do not believe it. We simply must take a careful reading and formulate a policy that will allow aviation to grow and assume its rightful place.

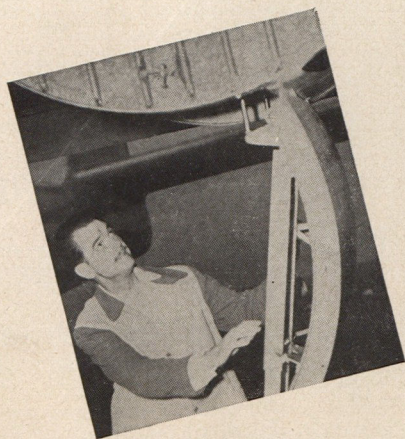
I submit here today that we as a nation cannot afford again to drop behind in air power. We must remain strong to discourage aggressors.

**New Yorkers** who well remember when the AAF sent 1000 planes on a single mission were unimpressed when their city was "attacked" by 125 Superforts. It was all the Air Force could muster at one time.

JULY, 1947







# Howard Hughes

## WORKING AIRMAN

**H**ARD-DRIVING application of a master touch in such diversified fields as aviation, finance, scientific invention, industrial development and motion picture production has won Howard Hughes more renown and fortune than any single young American of his generation.

To his associates and employees and to the public as well, Howard Hughes has exemplified the dramatic reality of youthful leadership in American business and industry by piling one success on top of another, no matter how great the odds.

The tall, dynamic Texan, now forty-one years old, could have led a life of ease since he was eighteen on a comfortable inherited income from the Hughes Tool Company, pioneer oil-drilling equipment firm founded in 1908 in Houston, Texas, by his father, Howard Hughes. Instead he chose to put his money, his energy and his ingenuity to work expanding his heritage and founding new enterprises which have created jobs and advanced worldwide industrial progress in many fields.

Successful development and management of these enterprises has accumulated for Hughes a fortune estimated at \$125,000,000. Contrary to some published reports, which have liberally mixed fact with fancy, these millions did not come to Hughes through inheritance. Actually he inherited only a three-fifths interest in the Hughes Tool Company following the deaths of his parents. This interest was valued then (in 1924) at approximately \$300,000.

Young Howard left school before completing his junior year at Rice Institute in Houston to fight for the right to maintain control of his father's company.

Under Texas law, a boy under twenty-one could be declared legally of age if he had demonstrated his prudence and ability. Howard's record of scholastic and mechanical aptitude weighed heavily in his favor in his battle to preserve his father's company intact. He had been educated at Thatcher school, Ojai, Calif.; Fessenden school, West Newton, Mass.; and California Institute of Technology. At sixteen he had passed his college board examinations with high honors.

Impressed by his record of youthful accomplishment a Texas judge declared Howard of age at eighteen, despite the opposition of people who owned the other two-fifths of the Hughes Tool Company.

Young Howard erased the opposition in one swift move, by floating a bank loan and purchasing the other two-fifths of the company. The firm's business expanded rapidly. The bank loan was paid out of increased earnings. Hughes has since turned down substantial offers to buy the Hughes Tool Company and has arranged that its management shall continue after his death in the hands of the "boys in the company."

His achievements as one of the most colorful and success-

ful independent motion picture producers in the film industry preceded his numerous contributions to aviation. Before he was twenty-one he invaded Hollywood as a producer. He has produced thirteen feature pictures, including the \$4,000,000 triumph, "Hell's Angels," which introduced Jean Harlow in the screen's first major aviation epic.

During the depression Hughes temporarily abandoned movie production to devote his full time to his expanding aviation interests and activities. He had established an aviation research and development organization and acquired several airplanes in the late 1920's.

Hughes preoccupation with the problems of airplane design began in 1933, when he started designing and building the H-1, a high-speed, long-range racing plane, which was completed in 1935.

The H-1 was further ahead of its time than any airplane ever built, and its influence upon the design of military aircraft will perhaps never be adequately appraised. The sleek little low-wing monoplane, first flush-riveted airplane, first airplane with power-driven retractable landing gear and first to have jet thrust exhaust, bell-shaped cowling, air duct intakes on the leading edges of the wings and drooping ailerons, shook the idea, then prevalent in some quarters, that monoplanes were not practical as military pursuit ships.

In 1935 Hughes and his H-1 began chalking up the flight achievements which have studded aviation record books by establishing a new world's land plane speed record. On September 13, 1935, he flew his H-1 352 miles an hour to take the world's record away from France. That was many years before military pursuit planes attained this speed. He flew this same plane non-stop from Los Angeles to Newark in 7 hours, 28 minutes and 10 seconds to establish a new trans-continental speed record on January 17, 1937, maintaining an average speed of 332 miles an hour. This record remained unbroken for eight years.

Because of the outstanding performance of the Hughes racer in these and other flights, including a 1936 hop from Miami to New York in the record time of four hours and 22 minutes, the Japanese and Russian governments in 1937 offered Hughes a large sum for his design, which was considered then the most advanced and most efficient plane in the world. Hughes refused to sell the design to any other government.

Jap espionage agents were reported to have sent numerous newspaper photographs of the Hughes racer to the Japanese aircraft industry. The result of this typical Japanese copying, aviation observers say, showed up later in the form of a striking similarity in the designs of the Jap Zero fighter and the Hughes racer.

At the time Hughes offered his designs for the H-1 to the Army Air Forces, he also discussed with AAF officials ideas



which he had in mind for the design of a twin-engine, twin boom monoplane. AAF was intensely interested and, as a result, instituted a competition for a contract to build such a plane. Meanwhile, without a contract, Hughes went ahead with his own designs for what was called the Hughes D-2. Lockheed, which offered designs very similar to those of the Hughes D-2, was awarded the contract, chiefly because it had facilities for producing such planes in quantity. Thus the Lockheed P-38, one of the most spectacular performers of the early phases of World War II, came into being.

After inspecting Hughes' D-2 design, the AAF awarded him a contract for 101 high-speed photo-reconnaissance planes. As a result of changing war conditions, this contract was later modified to provide only for three such planes as engineering models. Hughes has completed the three models at his Culver City, California, plant.

Always insistent on taking the risk of making the first flight test on every plane he has designed and built, Hughes almost lost his life in July, 1946, while testing the first completed model of the photo-reconnaissance plane—the XF-11. When he had been in the air for about an hour last July, a freak failure of the right propeller occurred, which suddenly threw the four rear blades of the two-bladed contra-rotating propeller into reverse pitch.

The result was, Hughes explained, that this propeller exerted a powerful backward push of about 4000 pounds against the right side of the airplane, causing it to crash. Hughes sustained severe injuries, but has since fully recovered.

Hughes was not content to have proved and dramatized the speed and efficiency of his pace-setting low wing monoplane design and twin-boom construction which pointed the way to higher speeds and longer range for military airplanes. His research activities over the years consistently took in all the factors affecting air transportation: air transport design; navigational, safety and radio communications systems; pilot efficiency, aerial mapping, weather observation and general airline safety and passenger comfort.

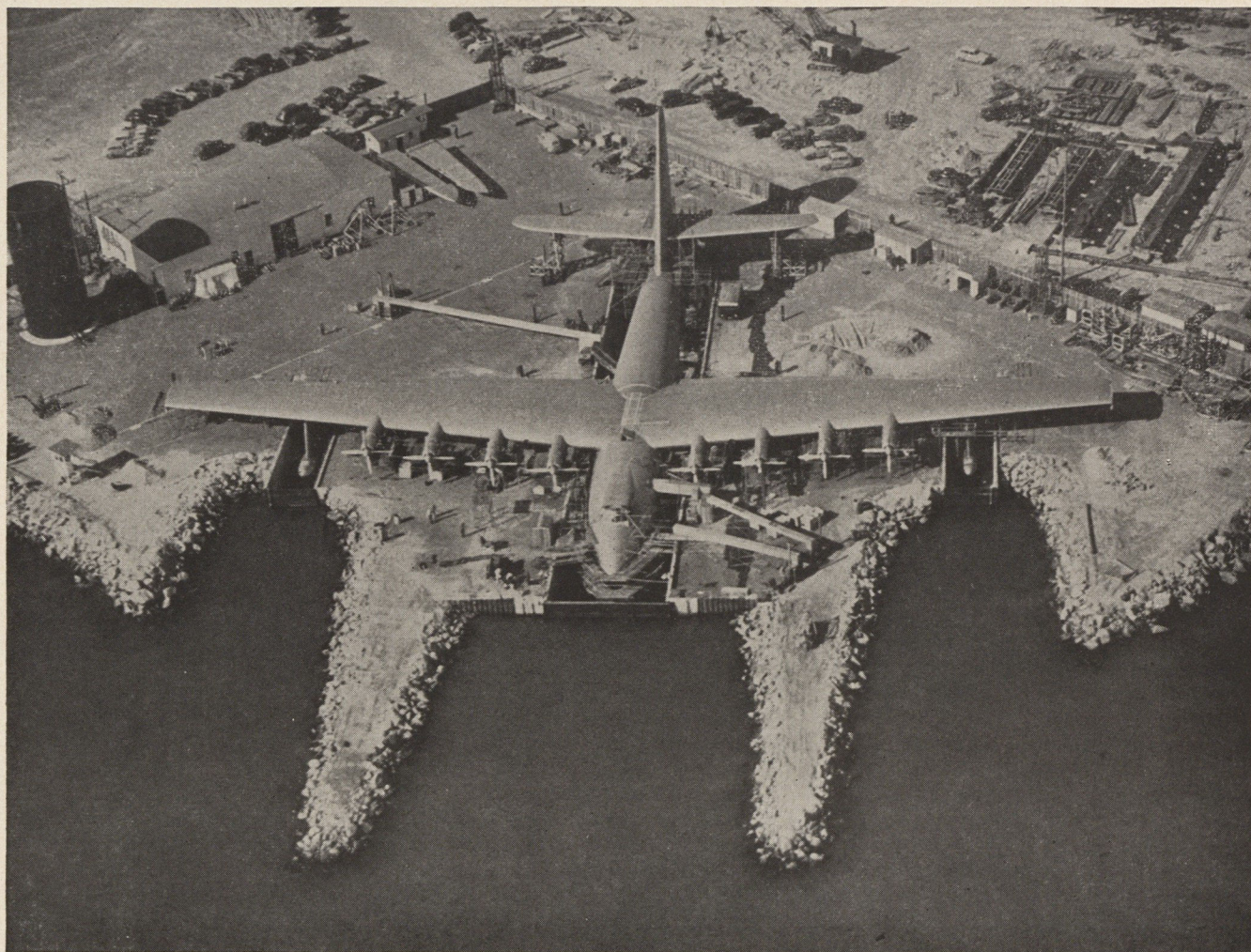
Hughes operated several flying laboratories, including a DC-1, forerunner of the DC-3, and a Lockheed two-engine "14," built to his own specifications. He even worked for a time as a co-pilot for American Airlines, under the assumed name, "Charles Howard," handling passenger baggage and doing other jobs to absorb the practical details of airline operation.

It was in the Lockheed "14" that Hughes made the round-the-world flight which was acclaimed the most dramatically effective boost commercial aviation had received up to that time—1938.

With a crew of four, Hughes took off from Floyd Bennett Field, New York, and flew around the world via Paris, Moscow, Omsk, Yakutsk, Fairbanks and Minneapolis in 91 hours and 14 minutes to establish a new global flight record over a 14,824-mile route. On the first leg of the famous flight, Hughes cut the previous New York to Paris record exactly in half.

Tangible results of the Hughes global flight were soon in practical evidence in the form of a tremendous spurt in air

One of Hughes' most ambitious projects is the building of the giant Hughes Flying Boat now nearing completion in California. The world's largest airplane, it is constructed entirely of wood. Dis-assembled wing-tips can be seen by small shack at top left-center of picture. Hughes himself will pilot first hop.





## HOWARD HUGHES

travel. One airline alone reported a 150 per cent increase in passenger traffic out of New York the day after Hughes landed. This increase was attributed largely to the impact on the public of Mr. Hughes' own analysis of the meaning of his flight, in terms of making long-distance air travel, normal, safe and routine transportation.

During the flight Hughes employed his own specially designed radio communications system to demonstrate the practicality of long-range air-to-ground radio communication. He maintained the longest air-to-base radio link in history—5730 miles from Yakutsk, Siberia to Hermosa, California.

On the 1938 trip, Hughes also tested successfully a new Maxon computer, which enables pilots to compute navigational data in a matter of fifteen seconds instead of requiring from twenty to thirty minutes.

In preparing for the global flight, Hughes foresaw the need for an emergency rubber life raft that could be used in case of a forced landing on water. He ordered such a life raft built to his specifications and carried it in the plane, together with sailing and fishing equipment and other life-raft accessories that were standard equipment in World War II military aircraft.

In addition to the rubber life raft, Hughes conceived and developed an equally important rescue device which helped save the lives of hundreds of US and United Nation's airmen during World War II. This was an emergency portable radio transmitter designed by Hughes in 1937 and carried with him as safety insurance on his world flight. These small radios were known during the war as "Gibson Girls," because of their wasp-waisted shape.

A wealth of valuable and hitherto unknown flight, navigation, meteorological and geographical data discovered in the 1938 flight was turned over to the Army and Navy air arms by Hughes. The flight made some important contributions to aerial mapping. Hughes discovered, for example, that the Russian coastline around the Bering Sea area was different from that shown on existing maps. He kept careful notes and turned correct coastline data over to the Navy.

The flight also demonstrated the essential usefulness of an automatic pilot system, with remote controls to permit the navigator to exercise complete directional control of the airplane, when necessary on long missions, thus freeing the pilot to calculate fuel consumption, power and balance.

The Lockheed "14," solely because of its performance on the 1938 flight, became the Hudson bomber, used effectively by Britain's Royal Air Force during the early stages of World War II.

Since 1937 Hughes had worked closely with the youthful executives of Transcontinental and Western Air, Inc., (TWA), in developing and testing air transport planes and

in finding ways to improve operating efficiency and passenger comfort.

In 1939 he began to buy into TWA—now Trans World Airline—and is today TWA's controlling stockholder.

As early as 1937, Hughes had conceived, designed and built the first mock-up model of the "Constellation," one of the world's fastest transport planes in commercial use. To make sure this plane would be built, Hughes in 1939 contracted with Lockheed to build nine Constellations, and later amended the contract to order forty of the giant planes at a cost of approximately \$20,000,000—giving his personal IOU for the purchase price.

The first nine Constellations delivered to TWA were turned over immediately to the AAF Air Transport Command by Hughes in 1944 and 1945. Hughes' delivery of the first Constellation established the plane's capabilities in spectacular fashion. He flew a Constellation from Los Angeles to Washington in the record-breaking time of 6 hours and 58 minutes, at an average speed of 330 miles an hour, set a new coast-to-coast record for transport aircraft and topped even his own previous 1937 flight in his H-1 racer.

Hughes was one of the Army and Navy's most important single developers and producers of aviation, ordnance and electronic equipment. He completed a total of \$100,191,762 in government contracts during the war. His total profit on these contracts was only \$3,191,354. He made no excess profits and paid no excess profits taxes.

Hughes' development of a flexible ammunition feed chute was one of his most valuable contributions to AAF fire power. These chutes, devised by Hughes when designing his D-2 experimental twin-boom plane for the AAF, made possible a continuous flow of ammunition to 50 caliber machine guns. The development was instantly recognized to be of such vast military value that the AAF took from Hughes every foot of flexible feed chute that could be manufactured by hand at the Hughes Aircraft plant in Culver City.

Hughes delivered half the volume of feed chutes produced in America—a total production of 784,057 feet. These devices, credited with stepping up machine gun rate of fire by as much as five times, flew in nearly every B-17 and B-24 used by the AAF in combat. To implement the flexible ammunition chutes, Hughes also developed and turned out electric ammunition booster drives and delivered 89,512 units to the armed forces.

In 1942, when shortage of metals was in its most critical stage, Hughes Aircraft undertook production of aircraft assemblies from wood for use in training planes.

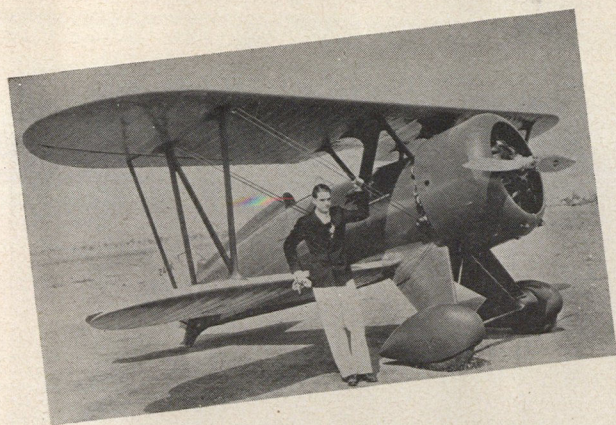
Hughes Aircraft delivered to the armed forces a total of 18,733 pilot seats, 6370 monocoque assemblies, 5576 wing panels and other units constructed by the "Duramold" process.

Hughes' most spectacular use of wood has been in the construction for the government of the giant Hughes-designed flying boat, the largest airplane ever built anywhere. Now completed, the ship is undergoing static tests in a graving dock at Terminal Island, Long Beach, Calif.

Rapidly changing conditions made it unnecessary to complete the flying boat during World War II. Hughes was specifically instructed by the government to take his time in the completion of the airplane as a non-priority research project with regard to both manpower and materials. Faced with the unavailability of either aluminum or steel alloys, Hughes has completed construction of the giant plane using laminated wood as the material.

The aircraft industry's experience has demonstrated that the cost of building a large prototype (first) airplane generally goes up at a rate far greater than the actual increase in size. The cost increases approximately as the square of the prototype plane's size. Therefore the cost of building the

*(Continued on page 48)*



Howard Hughes' career of breaking aviation records began in 1935 when he flew his own H-1 352 mph for new world high. Above he is shown beside Boeing ship with which he later copped more firsts



# Convair: AVIATION COLOSSUS

*The air of urgency is gone, but there is still a resemblance between Convair today and the industrial giant which during World War II produced nearly 350-million pounds of airframes*

BY PHILLIP ANDREWS

San Diego—Despite the assorted ills and aches that have beset the aircraft manufacturing industry since shortly before V-E day, there is one company that seems to be well enough to sit up and take nourishment—even move around a little.

The camouflage is gone, the wartime army of more than 100,000 workers has diminished markedly and those who remain approach their tasks with more deliberation than haste, but there is still a resemblance, however remote, between the Consolidated Vultee Aircraft Corporation of today and the industrial giant which, between Pearl Harbor and Hiroshima, produced some 350-million pounds of airframes—nearly 13 per cent of the nation's total.

With eight commercial, military and personal aircraft types undergoing flight tests, nearing completion or actually in production, the involved corporate structure that stems from the early efforts of Eddie Stinson and Jerry Vultee is doing very nicely, everything considered.

What most rival executives would probably like to know

is how Convair got that way. And there is not the hint of an answer in Convair's family tree. Whereas most of the major aircraft companies can point to the business acumen or inventive genius of a Glenn L. Martin, a Donald Douglas, a Robert Gross or a Larry Bell, Convair appears to represent the accumulated business acumen and inventive genius of many.

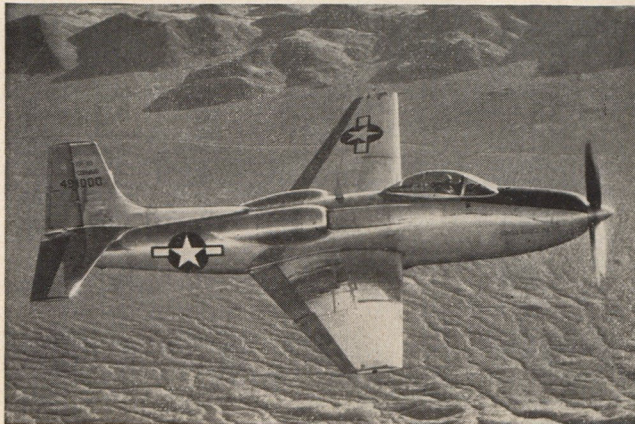
"Convair," short for Consolidated Vultee Aircraft Corporation, was formed in the spring of 1943 by a merger of Vultee and Consolidated, the latter having come into being some twenty years before under the direction of Major Reuben H. Fleet, who with his associates had acquired the assets of the Dayton Wright Company and the Gallaudet Aircraft Corporation, a veteran of 1908.

Prior to the Vultee merger, Consolidated had displayed an acquisitive tendency by taking over the Thomas-Morse, and Hall Aluminum Aircraft Corporations. Then in October 1940 Consolidated purchased the physical assets, designs, and

**New symbol** of America's might in the air is Convair's majestic B-36, the world's largest bomber. Wingspan of the aerial giant is 230 feet. Length is 163 feet. Ship has normal crew of twelve men.







P-81 is first plane with gas turbine engine to drive propeller.

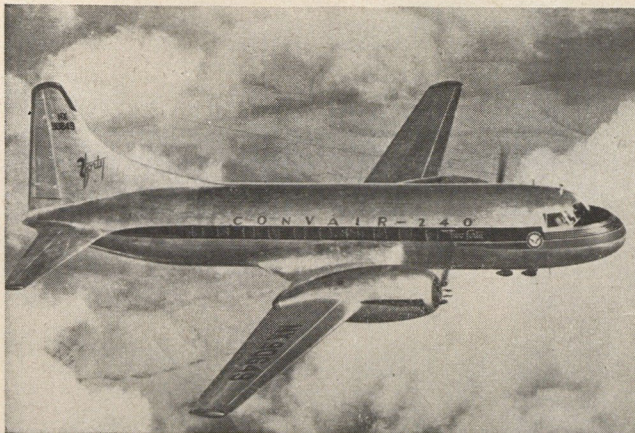
## Convair

good will of Hall Aluminum Aircraft Corporation. Just before Pearl Harbor, controlling interest in Consolidated Aircraft Corporation was sold to Vultee Aircraft, Inc., of Downey, California, a subsidiary of The Aviation Corporation. The name Vultee came from a young engineer and pilot named Jerry Vultee who organized the Airplane Development Corporation in 1932. In 1934, this company was acquired by Aviation Manufacturing Corporation. In 1936, the firm was liquidated and became Vultee Aircraft Division of Aviation Manufacturing Corporation. Vultee Aircraft, Inc., was formed on November 14, 1939, to acquire assets of Aviation Manufacturing Corporation, a subsidiary of The Aviation Corporation.

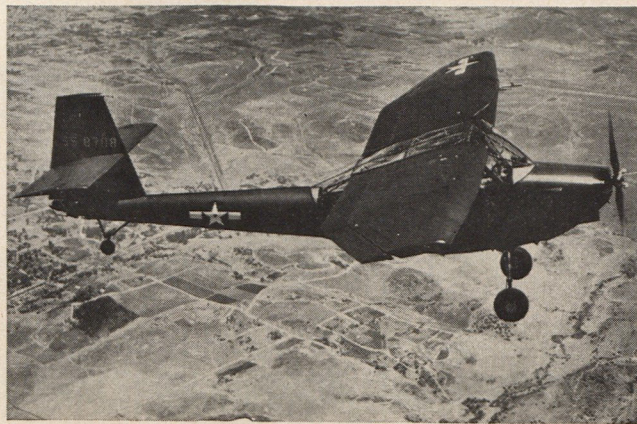
The oldest predecessor company of Vultee Aircraft, Inc., dates back to 1925, when Eddie Stinson, a pioneer aviator, and several Detroit businessmen formed the Stinson airplane Syndicate. Later known as Stinson Aircraft Company, it was purchased by Aviation Manufacturing Corporation in 1934.

In addition to the acquisition of Stinson, Aviation Manufacturing Corporation took over Barkley-Grow Aircraft of Detroit. Both of these divisions were put into Vultee Aircraft, Inc., in August 1940. The final acquisition by Vultee prior to the merger with Consolidated was the purchase in July 1942 of Intercontinent Aircraft Corporation, Miami, which was organized in 1940.

During the war period, Convair operated thirteen divisions throughout the country. Manufacturing plants were located at San Diego and Downey, California; Fort Worth, Texas; Nashville, Tennessee; Louisville, Kentucky; Wayne, Michigan; Allentown, Pennsylvania; New Orleans, Louisiana; and Miami, Florida. Modification plants were located at



World's first pressurized twin-engine airliner is the Convair-240.



First all-metal liaison plane was L-13 built by Convair on coast.

Tucson, Arizona, and Elizabeth City, North Carolina. The Stout Research Division was located in Dearborn, Michigan. Convair operated a transpacific airline known as Consairway for the Air Transport Command. With headquarters in Fairfield, California, Consairway completed 300,000,000 passenger-miles and approximately 100,000,000 ton-miles in flying high priority personnel and vital war cargo across the Pacific.

Between December 7, 1941, and August 15, 1945, Consolidated Vultee Aircraft Corporation delivered more than 350,000,000 pounds of airframes, or nearly 13 per cent of the total output of the nation's industry. This poundage comprised more than 28,000 completed aircraft and approximately 5,000 equivalent planes delivered as spares, or a total of more than 33,000 military aircraft.

More than two-thirds of the company's total output consisted of three outstanding airplanes—the B-24 Liberator heavy bomber, the PBY Catalina patrol bomber, and the BT-13 and 15 Valiant basic trainer. Convair's Liberator output totaled more than 10,000, including spares. Over 2,500 Catalina flying boats and approximately 4,000 Stinson L-5 "Flying Jeep" liaison planes were delivered. Largest production of a single type by Convair was 13,000 Valiants and equivalent spares.

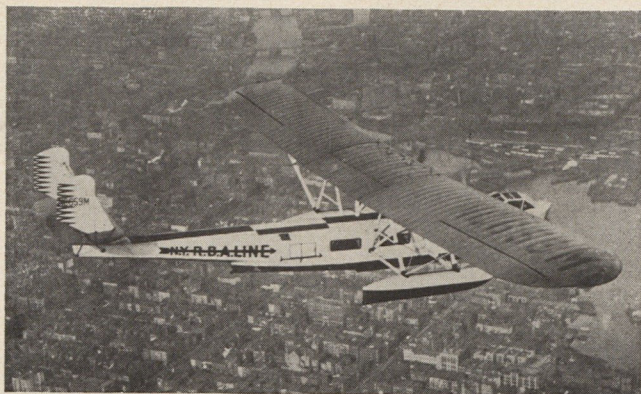
Other Convair-produced wartime airplanes included the PB4Y-2 Privateer Navy patrol bomber; the C-87 Liberator Express transport; the B-32 Dominator, most modern bomber in action as the war ended; the PB2Y Coronado patrol bomber; the RY-3 transport; A-31, A-35, and V-72 Vengeance dive bombers; the P-66 Vanguard pursuit plane; and the AT-19 Reliant navigational trainer.

Currently, Convair has either in production or nearing completion, eight aircraft designs; the Convair 240, the XB-36, the Stinson Voyager and Station Wagon, the XC-99, the XB-46, the L-13, and the XP-81.



More B-24s were used in World War II than any other bomber.





In 1927, Commodore flying boats linked US with South America.

The Two-Forty is Convair's contender in the postwar battle for the twin-engine, medium-range transport market formerly dominated by the DC-3.

World's first pressurized twin-engine airliner, the Convair-240 is a forty-passenger, 300-mile-an-hour, air-conditioned transport with great operating economy, excellent safety characteristics, and increased passenger comfort.

Although there is considerable glamor attached to the long-range operations of current four-engine transports, research has shown that the airlines have a continuing need for a "work horse" airplane to handle the bulk of airline traffic, which is relatively short-haul business. The average airline flight is less than 250 miles.

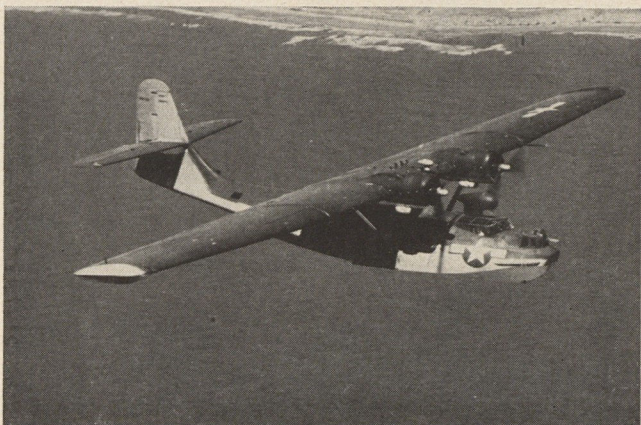
For short-haul overland operation, twin-engine aircraft offer adequate reserve power for safety and provide simplicity in flight and ground maintenance not obtainable with multi-engine aircraft. It is more economical from an operating standpoint for an airplane to use two large proven engines than four smaller ones.

These facts prompted Consolidated Vultee to enter the twin-engine transport field with the Convair-240, scheduled later this year to reach a one-plane-a-day production basis at the company's San Diego, California, plant.

Although equipped with conventional power plants—2,400-hp Pratt & Whitney engines turning reversible-pitch propellers—the Convair-240 is the first airliner to utilize Convair's jet exhaust propulsion principle for added speed. Energy from normally wasted exhaust gases is harnessed by special exhaust stacks and tubes to provide extra speed and to pump air around the engines for a revolutionary method of cooling.

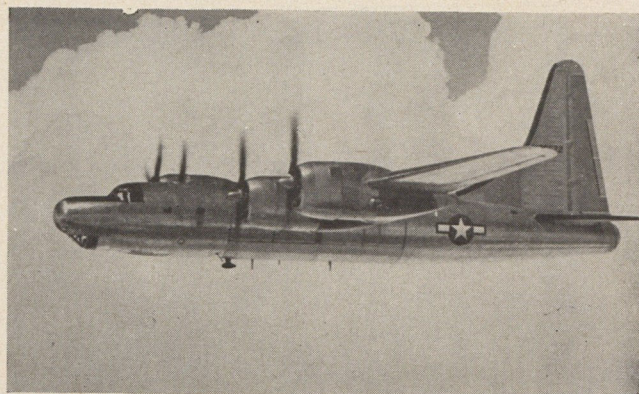
Convair's Stinson division at Wayne, Michigan, builds two single-engine personal airplanes—the four-place Stinson Voyage and the Stinson Flying Station Wagon.

Equipped with a 165-hp Franklin engine, the Voyager



Convair produced 2,783 Catalina PBY-5s and PBY-5As during war.

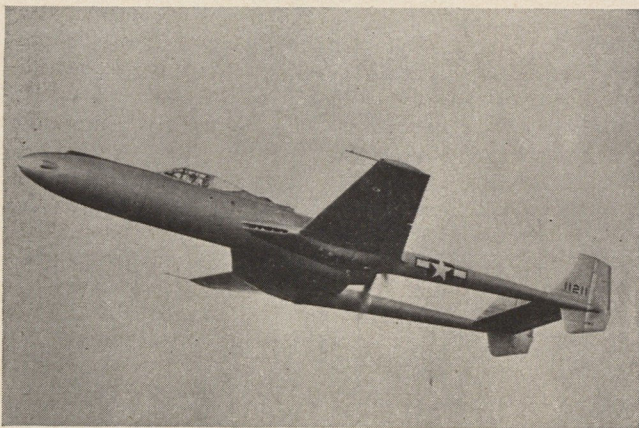
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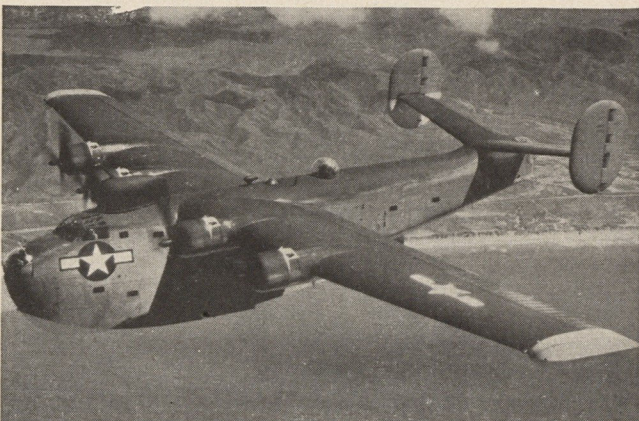
Running mate to the B-29, the Dominator was the faster design.



Consolidated-Vultee's jet XB-46 is the world's speediest bomber.

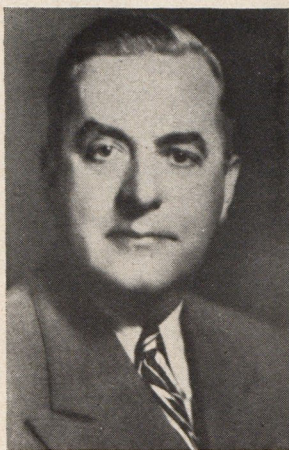
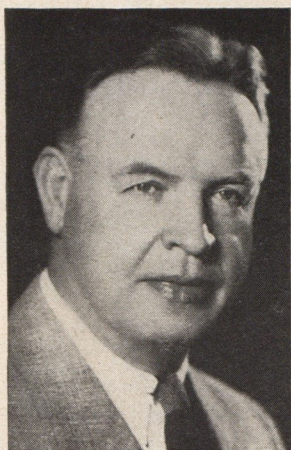


Army gained valuable data from Convair's experimental XP-54.



As patrol bombers Convair's Coronado sank tons of shipping in war.





Harry Woodhead, *Convair's Pres.* I. B. Babcock, *Board Chairman*

W. A. Bles, *V-Pres., Sales* I. M. Laddon, *Exec. V-Pres.*

## Convair

cruises at 125 mph and can take off in 590 feet fully loaded. Its range is more than 500 miles. The plane is easily maneuverable from small fields.

Cabin soundproofing, electric starter, two-way radio with cabin dome loudspeaker, parking brakes, landing lights, mufflers, generator, and dual wheel controls are Stinson Voyager equipment details.

The Stinson Flying Station Wagon, America's first multi-purpose personal aircraft, is a Voyager type which can be converted to a cargo plane in five minutes by removing the two rear seats.

This rugged plane provides twenty-four cubic feet of cargo space for equipment, produce, tools, or supplies. The Flying Station Wagon will carry the pilot, a full load of fuel, and as much as 552 pounds of cargo. Tie-down straps and canvas cargo cover permit loading the cargo compartment to window level. Eleven cubic feet of additional cargo space is provided in the baggage compartment in the fuselage immediately aft the cabin.

Performance of the Flying Station Wagon is comparable to that of the four-place Stinson Voyager.

World's largest bombers, 139-ton B-36s will be the main stays of America's postwar air fleet, greatly intensifying the striking power of the Army Air Forces. They are now in full production at Convair's Fort Worth, Texas, division, world's largest integrated aircraft plant.

The B-36 can carry 10,000 pounds of bombs 10,000 miles without extra fuel tanks, or its maximum bomb load of 72,000 pounds for a shorter range.

Its six pusher-type engines, developing a total of 18,000 horsepower, drive the world's largest propellers—nineteen-foot reversible-pitch props.

Wingspan of the aerial giant is 230 feet, length 163 feet, and height nearly 47 feet. Crew consists of twelve men, plus four relief members.

Translating B-36 facts into commonly known comparisons: its bomb bay can haul as much as four railroad freight cars; its six engines develop as much horsepower as five locomotives pulling streamlined trains; its wing tanks hold 21,116 gallons of fuel, enough to send an automobile around the globe sixteen times; and its volume of 18,000 cubic feet is equivalent to that of three average five-room houses.

### XC-99 Military Transport

World's largest land-based airplane, the experimental XC-99 cargo and troop transport is a 265,000-pound indication that tomorrow's armies and their equipment will travel by air. It is nearing completion at Convair's San Diego, California, division.

Capable of carrying 400 troops, or 335 litter patients, or 100,000 pounds of cargo, the double-decked aerial giant has

a wingspan of 230 feet, a length of 182½ feet, and a height of 57½ feet. It will have a maximum speed of more than 300 mph and a maximum range, with reduced loads, of more than 8,000 miles.

Like the B-36 bomber, of which it is a transport version, the XC-99 is powered by six 3,000-hp pusher-type engines turning 19-foot reversible-pitch propellers.

### XB-46 Bomber

Trim and aerodynamically clean, the XB-46 is one of America's leading and fastest entries in the world-wide race for jet-propelled aircraft. Built in Convair's San Diego, California, division, it is now being flight tested.

It is powered by four J-35 (TG-180) turbojet engines housed in two low-slung nacelles. This two-engine-per-nacelle arrangement, coupled with the extreme aerodynamic smoothness of the plane, makes the four-jet bomber look like a twin-jet fighter.

The experimental XB-46 is the first plane ever flown with a complete pneumatic system for actuation of landing gear, bomb bay doors, and brakes. It has the world's lightest self-sealing fuel tanks, with new-type gauges measuring mass instead of volume.

The XB-46's needle-shaped fuselage is 106 feet long, only seven feet less than its 113-foot wingspan. Height is 28 feet. Gross weight is 91,000 pounds and useful load, 42,982 pounds.

### L-13 Liaison Plane

America's first all-metal liaison plane, the L-13 is an aerial jack-of-all-trades with folding wings and adjustable landing gear. An outgrowth of the monkey-wrench improvisations of World War II, the L-13 does by design what most old-type liaison aircraft did by necessity. It is now in production at Convair's San Diego, California, plant.

The multi-purpose L-13 can be used for observation, communication, photographic work, wire laying, courier service, light cargo transportation, special radio activities, and ambulance purposes. The folding-wing feature makes it easy to tow, haul, or hide.

Powered by a 245-hp Franklin engine, the L-13 takes off in only 230 feet. It lands in 227 feet at 43.5 mph. Cruising speed is 92 mph and range, 368 miles.

Wingspan is 40 feet 6 inches; length, 31 feet 9 inches; and height 8 feet 5 inches. Gross weight is 2,900 pounds.

### XP-81 Fighter

The experimental XP-81 long-range jet fighter, now well along in its flight-test program, is the first plane ever flown with a gas turbine engine designed to drive a propeller. This engine (TG-100), in the nose, and a separate jet engine (I-40) in the tail give the XP-81 a top speed of more than 500 mph. The trim fighter can fly on either engine or both.



# Furth FIREBALL

*Two ingenious GI's turn wreckage into the first workable Army-run railroad system in the entire European Theater*

ON the outskirts of the ancient German town of Furth, famous in railroad history as the starting point for the first successful steam locomotive run to nearby Nurnberg, two enterprising US Army Air Forces military policemen with a yen for railroading and inspired, perhaps, by the "Casey Jones" background of the locale, have salvaged and put back into operation a small but important remnant of Hitler's bomb-blasted rail network. They did the job in three months after hearing German officials estimate three years.

The two MP-engineers are Sergeant Fred Hibben of Cleveland, Ohio, and Private First Class Jack Polito of Pittsburgh, Pennsylvania. They discovered the twisted wreckage of what was once a prominent artery of the Nurnberg-Wurzburg line in December, 1945, while stationed at the Furth Air Base. An inspection of the three-mile stretch of railroad convinced them that it could be repaired. With the transportation situation at the air base anything but ideal, the two prospective railroaders had little trouble in obtaining official approval to "rehabilitate" the wrecked line.

Hibben, a former railway student at the University of Pennsylvania, and Polito, an ex-machinist with the Union Pacific Railroad, turned in their MP armbands and got the project underway at once.

German PWs were put to work rebuilding bridges, grading curves and refilling bomb craters. Couplings and rails

were requisitioned. "Scrounging" parties brought in other equipment not readily available through regular channels. Less than three months after Hibben and Polito had surveyed the shambles of the old railway, the first train rumbled over the rebuilt line. They christened it the "Furth Fireball."

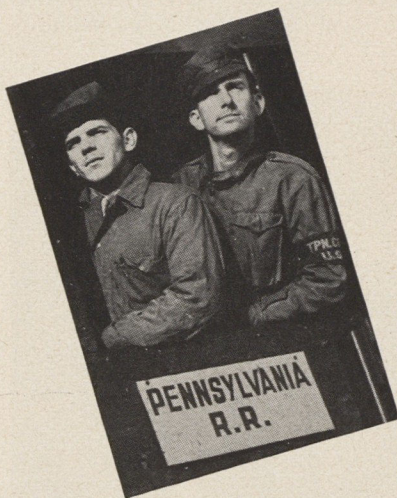
Today it is the only Army-operated railroad in the European Theater of Operations. Equipped with two Diesel-powered engines and fifteen utility cars, the line does a herculean job of transporting scrap metal, coal, gas, aircraft parts and other vital matériel. Thousands of tons of freight were hauled by the line last year, including baby carriages destined for the families of AAF men stationed at Furth.

The new railroad recently proved itself capable of emergency operations when a gas dump in the Marsfield yards near Nurnberg exploded. German authorities sent the GI "short line" a rush call for aid. Working with professional speed and with complete disregard for their personal safety, "Fireball" soldiers hustled 800 gas-filled tank cars out of the danger zone in record time.

"Just give us a switch tower signal system and we'll match our line against any railroad in the States," say Hibben and Polito when discussing their project.

When their term of enlistment expired, both men promptly signed up for another hitch overseas. The reason?

"The 'Fireball' is our baby. We've got to stick with her."



Pfc Jack Polito and Sgt Fred Hibben looking out of the cab of the only GI-operated railroad in the ETO. Right, the Furth Fireball, rebuilt diesel railcar clips off 90 mph.





# AFA Convention

*The conclave at Columbus is going to be more than a hangar-flying session. It will be an opportunity for all AAFers to give direction and purpose to the Association's activities for the next year*

**T**HE Air Force Association convention at Columbus, Ohio, on September 15 and 16 is going to be more than the first postwar AAF hangar-flying session.

It's going to represent a real opportunity for the members of the Association to hear messages of national significance from some of the nation's leading men, and it also will represent the first opportunity for AFA members to decide certain things for themselves—who their national officers will be, for example, and which way the AFA will go in 1948.

Invitations to speak extended by AFA President J. H. Doolittle have been accepted by Assistant Secretary of War for Air W. Stuart Symington, General Dwight Eisenhower, General Carl A. Spaatz and Eddie Rickenbacker, America's leading ace in World War I, and now President of Eastern Air Lines.

In addition, Lt. General George E. Stratemeyer, Commanding General of the Air Defense Command, will speak on the AAF reserve training program, and Major General Curtis E. LeMay, Deputy Chief of Air Staff in charge of Research and Development, is scheduled to bring AFA members up-to-date on jet, rocket and all other aeronautical developments and prospects.

Naturally, there will be plenty of time for reunions and to talk about that time you were hanging by your safety belt at 20,000 feet. Tentative plans now call for special reunions of all the numbered Air Forces, and there are some first-class entertainment and fun features in the works that should make this meeting one that will be remembered for a long time. But we also have to set the pace for the more serious activities of the Association, both nationally, and in its local and state phases.

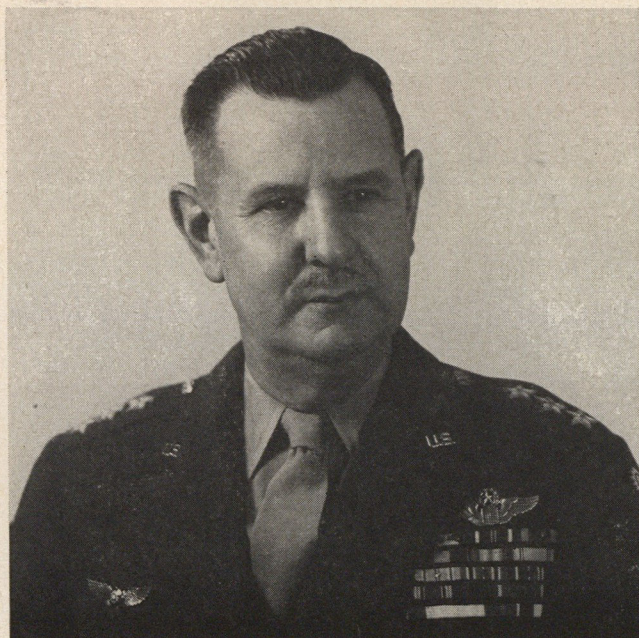
Details of the program in connection with the business session of the meeting are being worked out right now by the National Convention Committee, which is headed by Burt Donaghy, former master sergeant, in coordination with the AFA headquarters in Washington. We don't pretend to know all the answers, but in the year and a half of the Association's existence, we have got around a little and have received very welcome suggestions and criticisms from chartered Squadrons and from individual AFA members.

On the basis of that experience we are drafting up a program. Maybe you have a comment or bright idea of your own that needs consideration. If you do, don't hesitate to write the AFA headquarters a letter and let us know about it.

One of the major things to be done, of course, is to elect the national officers and directors of the Association. As you know, Jimmy Doolittle and the other national officers agreed to serve during the organization period, and to help get the ball rolling. But they're like everyone else—they've got jobs to do, and the business of heading a national organization makes heavy demands on time and energy.

Then, too, the AFA is founded on democratic principles, and our present national leaders are anxious for the members to elect officers of their own choosing, and according to the traditional democratic processes. Members at the convention therefore will be given the opportunity to elect an Association President, three Vice-Presidents, a Secretary and an Assistant Secretary, a Treasurer and eight Directors.

During the first year of operation, the Association has been engaged in an extensive drive for individual members, and in a program for the organization and chartering of Wings in each of the states and of Squadrons in communities

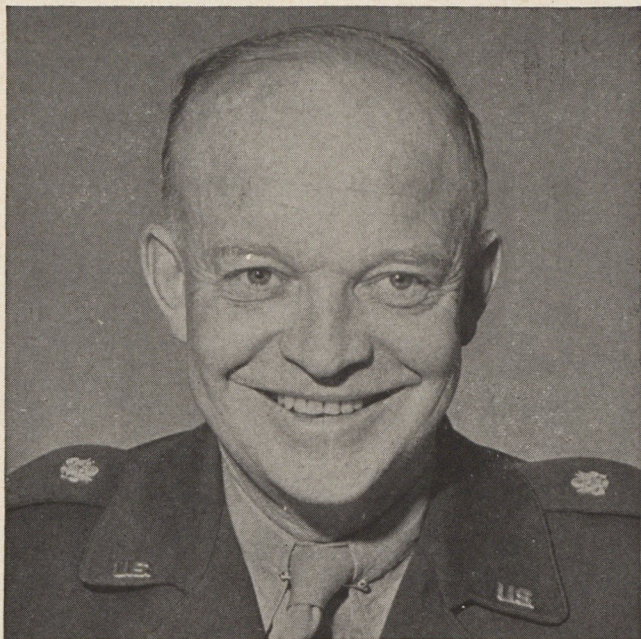


Defense Command's Lt. Gen. George E. Stratemeyer will be there . . .



as well as Eastern Airline's President, Captain Eddie Rickenbacker.





Chief of Staff Dwight D. Eisenhower has accepted the invitation . . .

throughout the country. In addition every effort has been made to take positions upon, and to further those principles which make up the Association's national program.

Convention delegates will have an opportunity to reaffirm those principles, or to recast the national program of the AFA if that seems to be indicated. They also will have a chance to consider the activities of the individual Squadrons . . . to suggest activities which can be sponsored by the Squadrons alone, or with guidance from AFA headquarters.

A number of problems have come up in recent months which require convention action. One of these is whether or not the eligibility requirements for membership in the Association should be relaxed to permit affiliation by the thousands of Americans interested in the Association and its program, but who are not eligible under present regulations.

When the eligibility requirements were established originally to grant AFA membership only to those who had served as military personnel with the Army Air Forces or the old Air Corps, it was realized that the door was being shut on



and so has the Army Air Force's own boss, General Carl A. Spaatz.

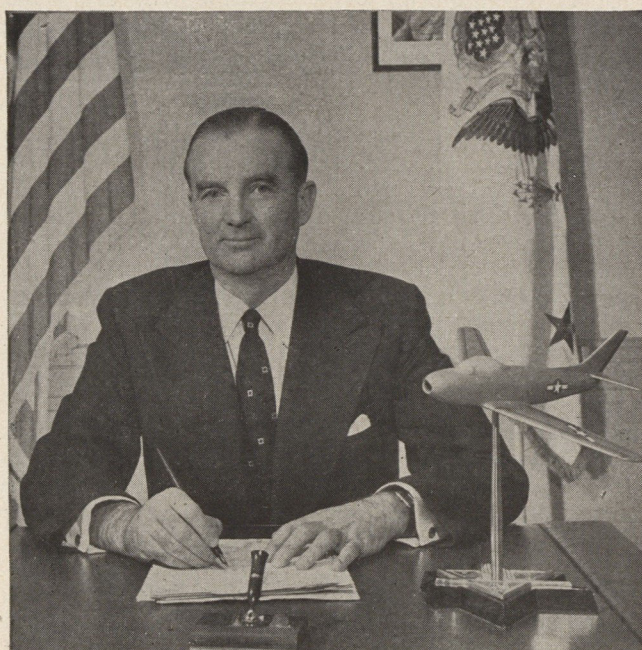
many persons who not only would welcome affiliations with the organization, but who also would be able to contribute much to its progress. The present officers and directors have adhered closely to the requirements established under the AFA constitution until such time as the AFA membership was in a position to decide democratically what the breadth of the Association membership should be.

In addition to the thousands of private pilots in the nation, potential members include the women who flew for the AAF during the war in ferrying and two-target work as the WASP; members of the Civil Air Patrol, and college and university students not otherwise qualified who will be graduated from advanced Air-ROTC courses and given reserve commissions in the Army Air Forces.

In other words, this is your organization. It will accomplish just what you want it to accomplish and will progress and prosper according to the interest and active part you as members take in it. This first convention is going to give you the opportunity to have your say.



Maj. General Curtis LeMay and his ever-present cigar are coming  
JULY, 1947



. . . and so is W. Stuart Symington, Asst. Secretary of War for Air.



# What Price AIR POWER?

*The AAF's original request for appropriations was the minimum required for sky security. Congress axed the figure and now, the nation is approaching its pre-Pearl Harbor state of aerial unpreparedness*

BY KENDALL K. HOYT

**R**EBUILDING the Air Forces into a hard-hitting organization of ready units, painfully slow as it has been, will advance no faster in the next twelve months. There's just one reason—money. A ceiling has been clamped down upon manpower, equipment, and activity in the annual appropriations.

One of the most serious consequences of delay in armed forces unification is that the AAF, lacking autonomy, has been powerless to fight for enough funds to support even a minimum plan of air defense. The Air Generals, a minority interest in budget-making for the War Department as a whole, have seen their most modest requests hacked and slashed and their inadequate allowances cut still further to make up deficits in the ground and service forces.

Whatever changes may be made in organization, by autonomy or otherwise, the money situation is unlikely to improve much till after June 30, 1948, the end of the current fiscal year for which appropriations have been voted. Barring some few deficiency items early next year, as may be hoped but not relied upon, relief is not in sight for twelve long months.

But the making of air power is a long-range process. As aircraft designed today may not go into production for five years or more, it is not premature to look ahead to the 1949 fiscal year for which plans are already being made. If the air force veterans will study the timetable and will show up to voice their views at all points along the route, the outcome of the next budget can be more in keeping with the needs.

As this is written, the War Department supply bill, including AAF items, is about to go through Congress. The AAF surely will not take as deep a cut as the Civil Aeronautics Administration which was slashed by \$70 million from a \$190 million budget. It may lose less in proportion than the Navy's Bureau of Aeronautics, clipped in the House by \$55 million from its \$530 million budget, not counting \$170 million in contract authorization. Some people may smugly conclude that the AAF has won some sort of battle.

But the fact is that the AAF budget was far too low in the beginning. Including a \$280 million contract authorization, the AAF was approved for a total of \$1,130 million for the fiscal year 1948 as compared with \$1,200 million, in round numbers for fiscal 1947. Since 1947 funds were subject to economy cuts, the 1948 budget turned out slightly more than for the past fiscal year. Costs are higher so there is no net gain; rather a loss.

Yes, a billion dollars is a lot of money. But after the needs of the air forces around the world are covered and the minimum needs of the bases across the country supplied, there is not enough to support the establishment deemed necessary as the rock-bottom for defense much less for modernization to keep pace with other nations.

The minimum need, set by AAF planners at the end of the war and since checked by careful staff studies, is for a 70-group air force with 400,000 men. This year's budget provides for no more than 55 groups, skeletonized at that. The manpower, though actual statistics are not published,

is known to be substantially less than 400,000; perhaps in the range of 350,000. Only about 200 bases are open in the United States and many of these are on caretaker status.

In terms of aircraft, the Air Coordinating Committee, representing the federal agencies interested in aviation, set 3,000 planes per year as the minimum military production to support a skeleton industry. This year's budget allows for less than 900 so, with Naval procurement added, less than half of the ACC figure will be met and that figure is subject to considerable upward revision.

When the estimates were made by the Budget Bureau, the AAF was heard not by direct appearances of air officers but mainly by War Department spokesmen. Its budget represented not a fair appraisal of the needs of air defense but rather a percentage of the funds granted to the Department as a whole. Though air power is presumably the first and last line of defense, the AAF was given only 16% of total War Department funds for fiscal 1947 and 17% for fiscal 1948.

Once the big Budget book, a 6-pound volume of 1,424 pages was made public in January, the AAF was gagged by stern edict against any intimation that any item was insufficient. The most routine fund items were classified as Secret. Air Force public relations people were forbidden to give the least interpretation to the press. So the fact that the AAF budget stood at the level of the year before was hailed as good news. A few perfunctory stories in the back pages of newspapers have not been enough to make the public aware that anything was wrong.

It is not that the War Department has discriminated against the Air Forces. The system is to blame rather than any individual or group; the old outmoded system whereby the AAF, subservient rather than free, has had to have its requests pared down to fit over-all plan of a department dominated by ground officers.

The result may be plainly read in a statement by Secretary of War Patterson. When it appeared that his Department was to be cut 15% by the economy fiends in Congress, one would have thought that the AAF, as the spearhead of the whole security plan, would take less of a reduction in percentage than the traditional branches. But Mr. Patterson declared that such a cut would reduce the number of groups from 55 to 35; the number of major AAF stations from 82 to 50; and aircraft procurement from 900 to 500 planes.

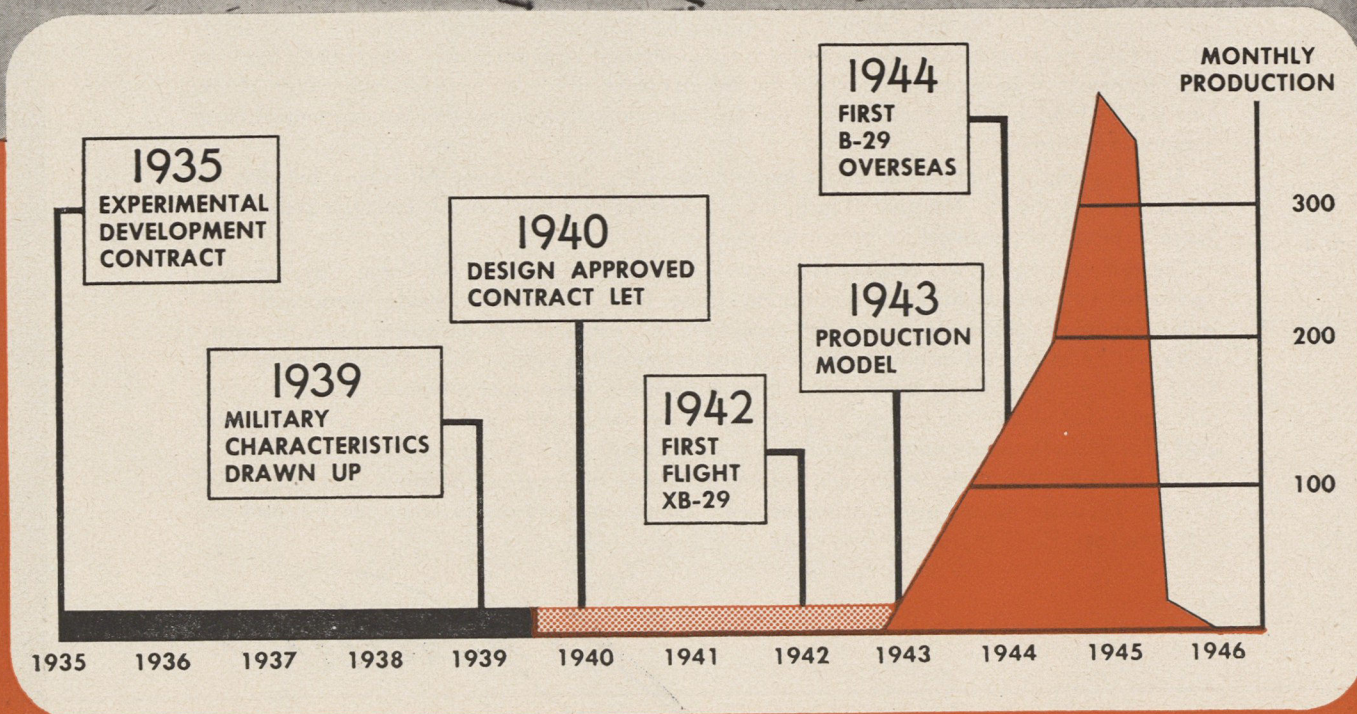
In other words, a 15% cut in the Department as a whole would have been taken out of the air forces to the extent of about 40% in major items. There could be no more glaring example of the kind of thing that can happen to the Air Forces as long as they lack independence to make their own fight for funds.

Not only are budget requests pared down, but once money is granted by Congress, large sums may be taken away to meet the requirements of the War Department. That is what happened to the Air Reserve program, a sore point with most members of the Air Force Association who, as loyal reservists, want to serve in peacetime.

At the war's end, the Air Reserve was planned for \$200

(Continued on page 47)





Wishpower or executive orders do not create military airplanes. Nine years elapsed between signing the B-29 experimental contract and its first battlefront appearance. Full production did not arrive until a year later. Considering the amount of research and development still to be done on jet power and supersonic aircraft, major reduction in development time can only be accomplished by the outlay of tax money.



J. H. DOOLITTLE  
PRESIDENT  
W. S. FITCH  
EXECUTIVE DIRECTOR



PHONE NATIONAL 2525  
NATIONAL 2694

## Air Force Association

1603 K STREET, N. W.  
WASHINGTON 6, D. C.

Dear AFA Members:

Two years ago this Nation had the mightiest military striking force in the world. Its crushing strength lay chiefly in a modern weapon—air power.

For those who did not see our air forces in action, or the results of that action, it may be difficult to evaluate properly the significance of American air superiority in the recent conflict with Germany and Japan—what it meant in terms of victory or defeat. But to those who know the true meaning and effectiveness of air power, it is clear that the future peace and security of the United States depends to a large degree upon the maintenance of American air strength and the continuous exploration of new air frontiers.

This year, all airmen will observe Air Force Day not only as a memorial to past deeds and the heroic dead, but as a sought-for opportunity to remind Americans everywhere that we are in an air age where events move far too fast; that air power is an effective instrument of world peace; that the American people themselves have a grave responsibility in supporting and providing an adequate air force.

Each citizen must be informed of the relationship between a strong air force, national security, and the preservation of the peace. Young men who can qualify must be acquainted with the opportunities which the Army Air Forces afford for a career in aeronautics. They must be informed of the possibilities for personal study in civilian academic and technical institutions, as well as the opportunities to learn a trade in the numerous fields of aeronautical science while serving their country. America must be informed of the benefits that have accrued to the Nation through research and development carried on through the years of peace and war by the Army Air Forces—such as the development of pressurized cabin aircraft; contributions to flying safety through the development of the GCA (Ground Controlled Approach) and other safety systems; the refinement of jet-propelled aircraft; the development of rocket-powered supersonic planes like the XS-1, XS-2, XS-3; discoveries in the field of aviation medicine; and the opening of polar regions to air travel.

Air Force Day will not only stress the importance of the Regular Army Air Forces, but also the significance of the Air National Guard, the Air Reserve and the Civil Air Patrol in providing a trained reserve of personnel for an emergency.

The Army Air Forces will conduct Nation-wide activities to support Air Force Day, which is sponsored by our own Air Force Association. These will include Nation-wide broadcasts, television programs, public statements and addresses and exhibitions of air power. Much of the activity will be conducted locally, in the cities and towns of the Nation. Exhibitions and demonstrations of aircraft and flying equipment will be included in these local programs. Air installations will have "open house" on certain days which will be announced locally. Many civic, patriotic, and fraternal organizations will join the Army Air Forces in observing the day.

It is my hope that Air Force Day will become a symbol of American progress and that it will serve to keep our people aware of the need for air power if we are to retain our freedom and our greatness.

**AIR FORCE DAY: AUGUST 1**



# The Purple Testament

*If the combat veteran is sure of humility and respect, he doesn't mind recounting those searing, indelible moments of battle. In lots of ways it helps him forget them. Purple Testament is a book of such memories*

About a year and a half ago the American University in Washington, D. C. introduced a course to train disabled veterans to become counselors for the Veterans Administration. But the professor, Don M. Wolfe, soon found that his students were too tense to absorb the material being given. They weren't yet over the war. As the psychologists say, they needed "rehabilitating."

To get them to relax, Wolfe asked his pupils to put their experiences on paper, to "drop the heavy stone of memory into the pool of language." Slowly, painfully, the men wrote out their experiences—their childhood memories, the early days they spent in the armed services, their battlefield nightmares. "The Purple Testament," a book of some one hundred short, highly personal pieces, is the result. As a classroom catharsis Wolfe's trick was highly successful. Purged of their pent-up emotions, the men soon became interested and ambitious "students." As a book, Testament is one of the outstanding documents to come out of the war to date. The following excerpts are reprinted by special arrangement with the publisher, Doubleday.

## THE SECOND JUMP

FORT BENNING, GEORGIA, SEPTEMBER 26, 1941. Today we were to take the second jump. The air was damp and heavy. Previous test runs had been made and now they were ready for us. I wondered if all that training for three weeks previously had been in vain. I felt that I was at the height of my physical condition because of the five-mile runs, calisthenics, and dozens of other physical exercises. I had come through my first jump although I didn't remember anything.

The Captain gave the order to board the ship. We took our seats which were previously assigned. The plane raced its motors and we were on our way. I realized then what I was going to do. Little things like "Get up, George; be sure and get to school on time," which used to be Mother's opening phrase every morning, were running through my mind. The sergeant called for us to sing. Those who could open their mouths were trying to sing, and the rest of us were too scared and paralyzed to open our mouths.

We circled the field, and the order to stand up was given. I began to feel nauseous. My hands turned white and I felt weak all over. The devil himself seemed to have released a monster inside me. It seemed like weeks, but was only a matter of minutes before I wanted to heave my guts. I looked around and saw my green-faced buddy, who was vomiting into the bucket. By the time he had made way for me, it was too late. Up it came, over my legs and on the floor.

"Stand up and hook up," was the sergeant's command. "Stand in the door and prepare to jump." It seemed years before the final order. "Jump!" Now the minutes changed to seconds, then to split seconds; then it was my turn. Everything seemed to pass before me, all the paddlings over my

dad's knee, my mother giving me money to buy candy, the fights I'd had, the little incidents throughout my boyhood, as I stood for a fraction of a second in the doorway.

There it was, the tap on my leg which meant I was airborne. My head snapped, and I felt myself being slowed down in the air; then I looked above me and there was Old Man Fate himself holding my pure white silk chute aloft in the air, many feet above the ground. My mind was at rest. Everything was going to be all right.—GEORGE J. VEACH.

## IN A FOXHOLE WITH ERNIE PYLE

OUT OF THE RECENT conflict have come a great many heroes, men who have distinguished themselves on the field of battle. Among these men and certainly near the top is a skinny little pale-faced, white-haired guy named Ernie Pyle.

To all GI's, Ernie Pyle's name will live in their memories forever. I know it can never fade from mine. Yes, Ernie Pyle, one of the most modest men I have ever known or heard of, a man who loved life and life's people, a man who fought the war, not with a gun, but with an abundance of human understanding and a typewriter. He felt it was his duty to inform the people back home what their sons, husbands, and sweethearts were doing to win the war.

As long as I live, I'll never forget the day I met the "Little Man" (That's what all the boys over there called him). It was in France, last July. It had been raining for six straight days. All about me was mud, mud, and more mud. I was returning from an all-night combat patrol at eight in the morning. We had suffered many casualties in my platoon during the night. This caused me to be very high tempered and nervous. I saw in the distance a small figure, standing in the road. I couldn't quite make out just who or what it was. As I approached, I saw it was a smallish man, wearing an army rain coat. The rain coat looked six sizes too large for him. It fell below his knees and over his shoes. He wore a helmet that covered his eyes. He was wearing a pair of overshoes, but you couldn't tell them from the mud. Intermittently a shell would land on the open road upon which he was standing and he would flop down into the slimy Normandy mud.

I shouted to him, "Get the hell off that damn road, you fool! You want to get killed?" He just stood there like a stone statue. I shouted again, twice as loud as the first time. He finally ducked down into the deep, narrow





## The Purple Testament

ravine beside the road. I ordered my men to stay strung out along the road. Then, during the shelling of this road, which wasn't too bad, I made my way to the "Little Man." There he was, crouched in the ravine like a ball, his face lighting up with fear at the sound of each exploding shell. I asked him what outfit he was from. He told me he was a correspondent. I asked him his name. "Ernie Pyle," he murmured, his body trembling. "You're not the guy who writes about us GI's," I asked. "Yep," came the snappy answer in a weak voice. "Well, what do you know!" I kept repeating to myself. I acted just like a schoolgirl meeting Frank Sinatra. I introduced myself to Ernie. We sat there and talked for a whole hour during the shelling of the road. Ernie wasn't quite so jittery after we began talking. In that hour with Ernie in the cold, damp, muddy foxhole, I met and learned to know one of the most interesting persons of my life. We talked about home, about baseball, football, about religion and politics. Yes, and during that time with the finger of death pointing at us, we even told a few jokes.

I learned to love and respect Ernie Pyle like thousands of other men who fought with him everywhere. For everyone who met Ernie loved him.

I often asked Ernie why he didn't quit this life and go home and live like a human being. He'd smile and shake his head. "It's just like a player in a football game. The player doesn't want to sit on the sidelines and watch. That's the way I feel about it," he said shyly. You could tell Ernie meant every word he said.

When the news came last spring that Ernie had been killed, I felt a personal loss. I felt as if I had lost my own brother.—JOSEPH M. O'CONNELL.

### ROOKIE NEELY

THE TIME, SEPTEMBER 16, 1940. The place: National Guard Armory at Altus, Oklahoma. My first day of Army life had just begun. I was told to report to the quartermaster to draw clothes. Now I wear size twelve shoes, and the largest he had was size nine, so the result was I wore my civilian shoes. He threw a pair of pants at me, and when I looked at them I wondered if the army anticipated a flood. They were twenty-nine inches in length and my legs were thirty-five inches. Consequently, six inches of space prevailed between the bottom of my pants and the shoe tops of my white civilian shoes. I told the Sergeant either my legs were too long or the pants were too short. He informed me with an unusual amount of sarcasm that of his nineteen years in the Army he had seen only two sizes—too large or too small, and that I was unfortunate to get mine too small. My shirt turned out to be too large, so I tried to get my shirt and pants both of the too-small size. But luck wasn't with me. I was so mad, I could have shot the sergeant, but as yet I was a soldier without a gun. My conviction was confirmed when he threw at me an old campaign hat that had seen too

many wars. It had been soaked in sugar and water to restore its original stiffness. But it became too stiff and every time it was bent it would break. It, too, was of the too-small size, so I had to use my chin strap to keep the Oklahoma wind from carrying it off toward the south. I left the quartermaster, my spirits ebbing low, only to cross the drill floor to be informed by the sergeant of the guard that I was to go on guard at ten o'clock. When I told him I didn't have a rifle, he informed me in no uncertain terms that I could draw one from the quartermaster. "The goddam quartermaster again!" I thought to myself.

"Instead of going to the quartermaster, I should be going to the doctor to have my brain examined for volunteering for this damn outfit anyway," I thought. But it was too late, so I went on and drew my rifle. Cosmoline covered it, and I had only one hour to get it clean before going on guard. I appeared ready for guard at the correct time, the major part of cosmoline still on the rifle and the rest of it on my high-water trousers. I was placed on the last relief and was told to spend my spare time on my rifle. Two o'clock came too soon. My luck, as it was, still failed me, I was given the post walking up and down the highway in front of the Armory, parading in my too-large shirt with white shoes and dirty rifle. To complicate the situation, my parents came out to see me. I was reluctant to see them in this ill-fitting uniform. But I was relieved from guard for fifteen minutes to visit with them. As they started to leave, my father said, "You look nice in your uniform, son." It was the first and last time I ever had reason to doubt my father's word. I finished my daylight hours in mortal fear that my girl would come to see me also, but she didn't, and that was the only good luck I had that first day in the Army.—LEONARD L. NEELY.

### IN MY HEART, REBELLION

WE HAVE HAD TO RETREAT. Out of a small, dark river-valley on Guadalcanal, they have driven us back to the haven of our fortified area.

The stench of the mold-covered jungle floor is displaced by the acid-stench of gun fire and explosives. This valley is nestled between two peaked hills, and this morning we had gone into it on our bellies to drive the yellow sons of Nippon from the island. We were ambushed. From the tall palms they fired at us, from the river bank before us, and from every conceivable position in the treacherous, tough, and almost impenetrable jungle growth.

We came crawling, limping, stumbling, some of us being carried, out of this hell at night. This is war. I am among this motley mess of humanity as it pitifully drapes itself over the hill to wait the dawn. I find a large rock and throw myself behind it. I try to piece together the events of the past few hours. What is defeat? I don't know—and I don't much give a damn. I'm so glad, so honest-to-God glad, to be out of that inferno in the valley.

I hear that argumentative bark of the machine guns in the depths below. The rain starts. Large drops patter at first on the rock beside me, then increase in number till they form a steady drone on the rock. I see small groups of men huddle under their ponchos for protection from the rain. A man drops silently on the ground beside me, with a "Wasn't it hell down there?" I mumble a grouchy "Yes," and for no damn reason he laughs, a high, maniacal laugh, and cuts it off with a whimper.

Then from out of the night a voice asks, "Why?" I push it back. I crouch lower behind the rock and light a cigarette. Down the line I hear a murmur of voices, and the voice cries out again, "Why?" I don't know why. Pictures of the past come into my mental perspective, and for a few seconds I'm happy. There's Mom making coffee for Pop as he comes in







from the rain. Why the hell can't I be with them? What is this fight all about anyway? And there's Mack Smith at home, sitting on his broad rear while I'm out doing his fighting for him. Some guy over at first aid calls out to God to help him. That's funny. Doesn't he know that he is a forgotten man? Why does he want help? To go on in this blood bath, to go back into that god-forsaken valley?

Then, suddenly, I resolve: I won't go back. I swear to God I will not go back. From the depths of my soul the voice shouts and screams "Why?" and then laughs at me. Yes, I know why. Because I'm sick of it. I've got a bellyful of it, and, most of all, I'm damned scared. I try to pray to God—and end almost cursing him. Why does he just sit up there and watch us die? If he is just and good, why doesn't he help us? If that damned lunatic we have for a C.O. says go back, I will blow his goddamned brains out.

I feel the mud oozing up under my jackets and look down to find that I am lying waist deep in it. It's still raining, and every drop of water that hits my helmet echoes "Why?" For God's sake, what is the answer?

The chaplain comes by: "Anything I can do for you, Mac?" When he sees that I'm not hurt, he moves off into the night. Damned vulture—just waiting for somebody to drop dead so that he can pray his soul out of hell. Now why did I say that? Am I losing my mind? I know that he is a good guy and only wants to help us.

I wish to hell that tormenting rain would cease. Can't a man find any peace? Hell, no. Not in this mess of destruction. The dull gray is breaking over the valley below, saying to me that another day has come, and I see the smoke from the enemy fires in the distance, telling me that they also are aware of the same day.

I see the Commanding Officer coming down the line. He walked up to me. "Reid, be ready to move out in half an hour." My soul screams out, and I shout with it: "No! I won't go!" The words bring me back into the world, and with a mumble of apology I move off to take my place in that thin line of men who are again moving off into the valley.—  
WALLACE I. REID.

## MINUTES IN MY LIFE

FORET DE PARROY, Luneville, France, ten-hundred hours, October 9, 1944 . . . As I look out my periscope I see our objective for the day. This great lumbering Sherman tank has pushed its way through this dense forest for half a mile. We have not seen or contacted the enemy. We are all tense, the other four boys and myself. We cannot see much in this dense forest. We wait. I have my fingers on the trigger

of my machine gun as I strain my eyes looking through the periscope. I am ready for anything. Here, anything can happen. As always in battle, I am scared and shaking. There are all kinds of noises to be heard. Over the interphone comes the sound of "roger" Wilco out, BRR-BZZZ, BZZZ-BRR, BZZZ-BRR. PUT-A-OUT-A-OUT-A—the sound of large shells going through the air; soon, the heavy and loud explosion as they hit ZIR-BOOM, the Nazi 88, the one you never heard go off if it hit you. RAT-TAT-TAT—our machine guns; BUR-RUP, BUR-RUP, the German gunners answer back with their song of death. The rifles of both armies add to the cacophony. These sounds are the music of war. The weapons and instruments used in making the music. The name of the hellish music is "Death and Destruction."

Suddenly, a loud BONG, like the sound of a single stroke on a large bell. I am knocked from my seat to the floor of the turret. My cries of, "My leg! My leg!" mingle with the cries of the crew. Fire! There is a flash like a light bulb being snapped on and off. "O God! Oh God!" I think. "Let's get out of here!" I have seen tanks burn before. I help push the tank commander out. He has a bad stomach wound. I don't know how but I am able to help him out. Lipshitz, the gunner, starts out. I stop him and tell him to help me. I ask him to pick up my leg; he does. It doesn't bend at the knee, but way up in the thigh.

I poke my head from the opening in the turret. Over to the left is a three-man German anti-tank team. One of them fires at me as Lipshitz gives me a push. I land on the left side of the tank. The Germans are about ten yards away on the left. I wait in agony. There have been no sounds from our assistant driver or the driver who are still inside the tank, probably unconscious. "Comrade!" we yell over to the Germans. We are answered by the BUR-RUP of their machine guns. Good for us. What did we expect, we helpless fools? I ask Lipshitz to crawl with me. He tells me he cannot move. I find it very hard going.

I am about three yards away from Lipshitz. It is impossible for me to move any further. I prop myself against a tree. I look over at Lipshitz, and he is not moving at all. He must have got hit in the spine by those last shots. I look down at my left leg and I am bleeding very badly. My leg is torn to shreds from my knee to my hip. A bone juts out through this mess, pointing upward; I try to push it down, but the pain is too great. I notice a colorless fluid flowing out; it reminds me of chicken broth. There is also an odor coming from the wound, like that of a freshly roasted piece of beef. I try to stop the blood, but without success. The tank commander is yelling for medics; I also start to yell. Again the BUR-RUP of the German machine gun.

Up until now I have been fairly relaxed. I think of the Germans and wonder when they will come and finish their job of killing us. I wait. I console myself with the thought that I might be better off. Fleeting thoughts of my wife enter my mind. I look over at the tank commander, and he looks as if he is dead. His face is a ghostly white, and I can see his teeth through his parted purplish lips. Lipshitz lies on his stomach moaning quietly. Where are those Germans? I think of the mass I attended two days ago. I made my peace there with God. I am not afraid to die when I think of this. The Germans still do not come. I am sweating and I am awfully thirsty. I start to rave out loudly, not out of my head, but asking God for mercy. "Oh God, help us!" I begin. "Our Father who art in Heaven. Oh, please, God, help."

Out of the woods, stealing carefully up to us, our medical men, men of mercy. They put me in their litter and start through the woods. I am leaving the woods and this living hell. Nothing else matters, thank God.—JOHN J. REGAN.





# NEWS

## COLORADO

The Denver Squadron has just announced the results of its first annual election of officers. New Commander is Norman A. Ferguson who has been named Secretary of the Colorado AFA Wing. Charles A. Akers was elected Vice-Commander; Donald H. Puffer, secretary; Warren P. Helsley, treasurer. Denver AFA members may obtain additional information about the Squadron from Commander Puffer at 2566 Hudson Street.

## IDAHO

In Idaho, chartering of the Pocatello Squadron was announced in April with the election of William S. Hill, Jr., as Commander. Robert O. Baum is Vice-Commander and Earl D. Morgan is Secretary and Treasurer. Secretary Earl Morgan will be pleased to supply additional information about the Squadron to interested members. His address is: 529 South 7th Street, Pocatello.

## ILLINOIS

In Illinois, the activation of the Moline Squadron, AFA No. 1, was announced in May with the election of Neal Smith as Commander. William T. Leonard is Vice-Commander and James T. McLaughlin is Secretary-Treasurer. For members living in the Moline area who are not now affiliated with the Squadron, please contact Dr. Warren R. Steed, 1130 27th Street, for additional information.

Also new in Illinois is the Aurora Squadron with Arthur Culver as Commander; Arthur Mettel, Vice-Commander; Robert Powell, Secretary; Lawrence Rowe, Treasurer. Secretary Powell invites all present members, as well as other men who have served with the AAF, to contact him at 624 Oak Avenue, for further information about the Aurora Squadron.

## MARYLAND

Two new AFA Squadrons were chartered from the state of Maryland; both are at well-known American Universities.

First was The Johns Hopkins University Squadron at Baltimore where Robert B. Fowler was elected Commander.

Other officers at The Hopkins are: Burton S. Stern, Vice-Commander; Charles R. Higdon, Jr., Secretary; Walter M. Hedges, Treasurer. For further information, AFA members at Johns Hopkins may contact Secretary Higdon at 2419 Christian Street.

Second was the Black and Gold Squadron at the University of Maryland, College Park, where Donald Bolt is the newly-elected Commander. Lewis B. Hatcher is Vice-Commander; Andrew Mounce, Secretary; Theodore P. Ferrato, Treasurer. Maryland students wishing to join the AFA Squadron at the University are asked to call Secretary Mounce at the Military Department.

## MASSACHUSETTS

In Massachusetts, the most recently organized Squadron is at Chicopee where Ted Zolynski was elected Commander. Other officers are: Frederick J. Janik, Vice-Commander; Thaddeus Wegrzyn, Secretary; Thaddeus Derendal, Treasurer. Address is 80 Fairview Avenue in Chicopee.

## NEW YORK

Temporary quarters of the Bronx Squadron No. 1 were packed from wall to wall last month when James H. Doolittle, national president of the AFA, presented the organization its official charter.

Other guests attending the activation ceremonies were Major General Borum, Commanding General, Tinker Field, Oklahoma; C. S. (Casey) Jones, Wing Commander of the N. Y. Wing, AFA.

General Doolittle, in commenting on General Spaatz's statement that continued appropriations cuts will result in the reduction of the AAF to a third rate Air Force, pointed out that original plans calling for 3000 planes per year has already been cut to 800.

## NORTH CAROLINA

First Squadron to be organized under the new North Carolina's Wing plan for establishing Squadrons throughout the state is the one at Cherryville, home of Wing Commander

(Continued on page 32)



Out in California the Santa Monica Bay Squadron of Air Force Association finds plenty of ways to keep its interest in aviation alive. Here the group gives a new Douglas DC-6 a tail-to-nose inspection.

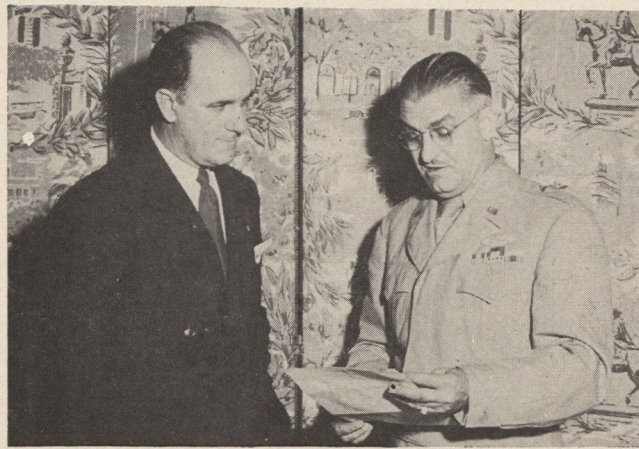


Attending AFA conclave in Ala. were, H. E. Hammer, AFA Hqs., M. E. Fontana, wing head, Brig. Gen. C. E. Thomas, Jr., CG Mobile AMC, Brig. Gen. B. E. Gates, AAFTC, and Col. Hubert Zemke.





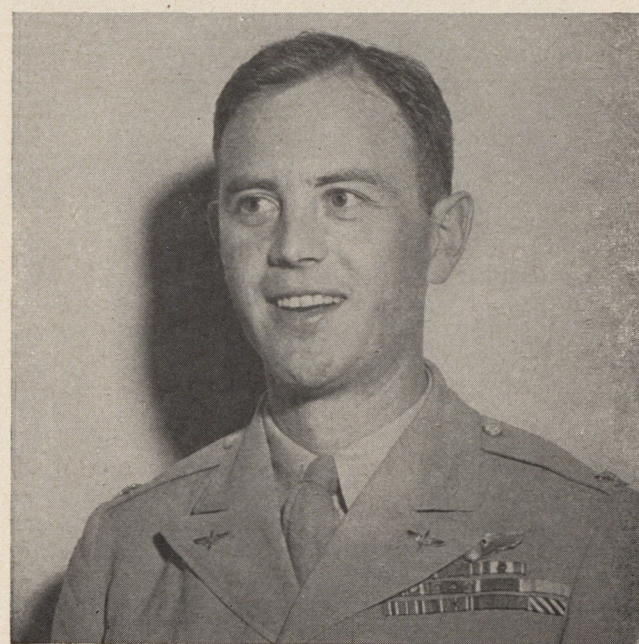
Jimmy Doolittle presents AFA charter to J. V. Falabells (with papers), commander of Bronx Squadron No. One while other officers look on. Tinker Field CG, Maj. Gen. Borum is third from left.



Brig. Gen. Charles E. Thomas, Jr., right, presents official AFA charter to Edward White, commander of Mobile Squadron at a dinner held recently at the end of a two-day convention of the Ala. wing.



Men who trained at Love Field in both wars joined Dallas AFA Sqdn. Memorial Day in decorating monument to dead flyers. From left, Larry Haley, R. V. Lents, Dallas AFA head, and R. E. Dennison.



Colonel Hubert Zemke, liaison between AAF and the Russian Air Force, told AFA members at Alabama State Convention that "we have no problem with Russian people, but with their government."



One of the healthiest TO's in the state of Pennsylvania is boasted by the Greater Wilkes-Barre Air Force Association Sqdn. Above they pose for their first official picture taken after recent meeting.

JULY, 1947



Bob Snyder, coach of Los Angeles Rams, tells Santa Monica Bay Sqdn. troubles of professional football mentor. Bert Lynn, vice-commander, Bob Kelly, and Stuart Purcell, sqdn. head, lend rapt ear.





Halloran's Holiday was the idea of Mary Gill, head of WAC Sqdn.

## HALLORAN HOLIDAY

**N**EVER underestimate the power of a woman" is an old adage. When you combine the efforts of more than one hundred women who are determined to make a project a success, you can lay down any odds that it will be. Last month, the All-Wac Squadron of New York City headed by Miss Mary Gill, decided to show the veterans at the Halloran Hospital on Staten Island that all the fun wasn't on the outside.

There had to be music, so they improvised a bandstand and set it up in the hospital auditorium. It had to be happy music, so they called on the maestro of the Chamber Music Society of Lower Basin Street. That evening, Henry "Hot Lips" Levine led his band in some of the fanciest "gut bucket" the vets had heard in a long time.

Earlier in the afternoon, a group of the Squadron members arrived to decorate the auditorium for the affair. One of the local studios had provided a few hundred dollars worth of scenery, gratis. And enough flowers to fill every vase with fresh cut blooms were donated by a downtown florist. For food, there were cookies and cakes which came from near-by merchants who wanted to help. A soft drink concern sent over enough cokes and sodas to satisfy every vet.

It wasn't the festivity that mattered so much, according to one bedridden GI, it was the fact that someone had thought of them. You're in the hospital a long time in the Army, even if the days which are marked off on a calendar don't add up to very many. Anything that is done to make the days go a little faster is appreciated by these men who haven't been able to forget that there was a war. "It's hard to realize how little it actually takes to make them happy," said Squadron Commander Mary Gill, "and yet, we really do so little."

Next month, good weather permitting, the Squadron plans to hold a similar event on the grounds of the hospital. A combination of Ol' Sol, female camaraderie, and picnic lunches should add up to another happy time for all.

## AFA NEWS

(Continued from page 30)

Rudisill. Chartered in April the Squadron elected the following officers: Lewis B. Doggett, Commander; Junious W. Sellers, Vice-Commander; Lloyd E. Bookout, Secretary; Robert C. Gurley, Treasurer.

Also new in North Carolina is Hickory Squadron No. 1, which was chartered in May. Officers of the squadron include W. Zack Hollar, Commander; William F. Thompson, Jr., Vice-Commander; J. Max Freeman, Jr., Secretary; Robert L. Baker, Jr., Treasurer. Members in the Hickory area are invited to contact Secretary Freeman, Route No. 2, Box 474, in order to affiliate with the AFA squadron.

### OHIO

Newest Squadron to be organized in the AFA-active state of Ohio is the University of Akron Squadron where fifty-two charter members formally applied for a charter in April. Officers of the University Squadron are: Henry C. Holliday, Commander; James C. Kerns, Vice-Commander; William G. Lamb, Secretary; Paul Howard, Treasurer. Secretary Lamb has asked that students at the University interested in becoming a member of the Squadron to write to him at 1706 Preston Avenue, Akron 5.

Also added to the Ohio State Wing is the Squadron at Marion where the following officers were elected: George D. Hildbrandt, Commander; Wayne E. Osborne, Vice-Commander; William C. Brown, Secretary; and James C. Sloan, Treasurer. Secretary Brown will be pleased to give additional information. His address is: 190 Forest Street.

### PENNSYLVANIA

The Blair County Squadron, AFA, at Altoona has been officially chartered with ninety-two members and John Good elected as Commander. Donald Slep is Vice-Commander; Wilbert L. Ketner, Secretary; Donald Nelson, Treasurer. Secretary Ketner's address is: Route 1, Martinsburg, Pa.

Another of the new Squadrons in Pennsylvania is the Duquesne University organization, which was chartered in late April. Officers elected at the first meeting were: Gerald M. Burkhart, Commander; Robert L. Klingensmith, Vice-Commander; Frank A. Mrak, Jr., Secretary; and William R. Mote, treasurer. Other Duquesne students who are now members of the AFA or men who have served with the AAF, are asked to write to Secretary Frank Mrak at 1127 North Avenue, Millvale 9, for information about the Squadron.

At a regular election of officers of the Greater Wilkes-Barre Squadron, the following men were named to serve a term of one year: Stanley K. Walborn, Commander; William Cushner, Vice-Commander; Forrest W. Price, Secretary; and Luther Gible, Jr., Treasurer.

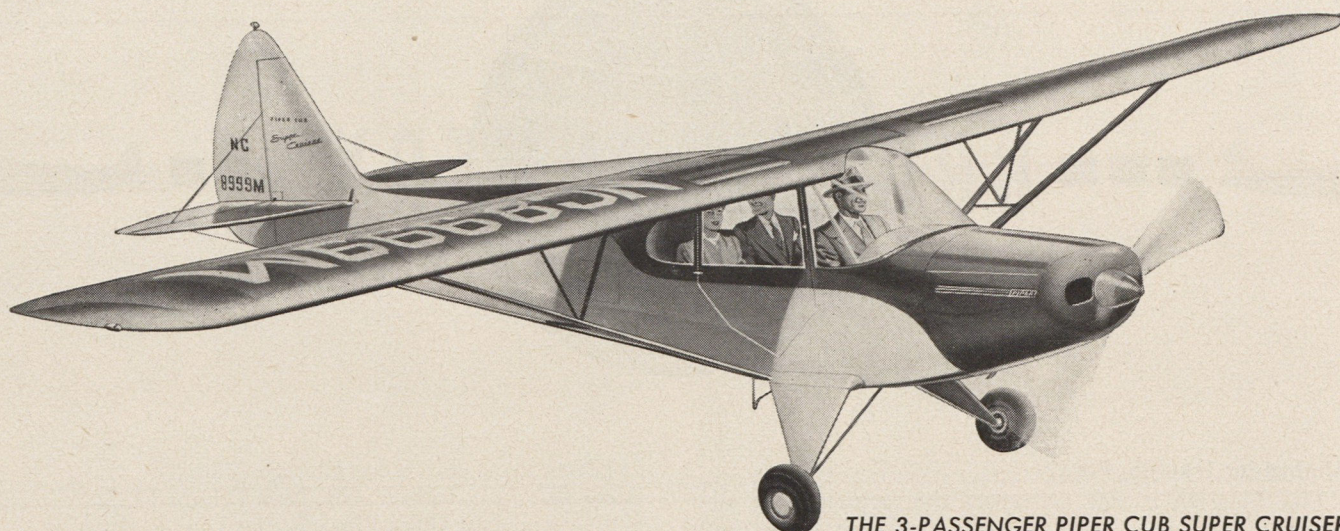
### RHODE ISLAND

The Rhode Island Wing of AFA, which recently has been carrying on a verbal battle-royal with the Governor in order to establish Air National Guard training in the state, has added another organization to its strength with the activation of the Newport County Squadron. Officers elected were: Robert F. Wood, Commander; Arthur S. Gilman, Vice-Commander; Arthur R. Richard, Secretary; and William R. Brazill, Treasurer. The Squadron's address is: Arthur R. Richard, 43 Hobbs Street, Newport.

### WASHINGTON

On the West Coast, another important addition to the AFA organization is the Seattle Squadron, which was chartered in April. Squadron officers include: Howard Hincer, Commander; Oliver E. Kearns, Vice-Commander; Billy M. Mattice, Secretary; and Vivienne Redfield, Treasurer. Address of Secretary Mattice is 1321 E. 70th Street, Seattle 5.





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speed, three people can take a one-hundred-mile trip in this good, safe plane for as little as forty-five cents apiece for gas. No wonder the Super Cruiser is the outstanding plane in the three-thousand-dollar field today!

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spring-filled seats make every flight a comfortable one. An electric starter and a two-way, two-band radio that gives both airways and regular broadcast reception are included as standard equipment on the Super Cruiser. Yet it is lower in price than any similar plane!

Ask your Piper Cub Dealer for a free flight demonstration, for the full-color literature on the new Piper Cubs and the new, revised edition of the book, *How to Fly a Piper Cub*. See your dealer, also, for low-cost flying lessons, plane rentals and his convenient Piper Taxicub Service. Remember—only Piper makes the Cub, that good, safe plane. Piper Aircraft Corporation, Lock Haven, Pennsylvania, U. S. A. In Canada: Cub Aircraft Corporation, Ltd., Hamilton.

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# **PIPER**





### Aiming for Trouble, Pard?

Like filing an income tax report, the registration of all automatic souvenir firearms is a task that must be accomplished by every GI or ex-GI who is at all interested in keeping himself out of the soup. The law is quite specific on the subject. "All veterans," it says, "who brought fully automatic souvenir firearms into the country must register them with the Commissioner of Internal Revenue, Washington, D. C., or face the possibility of conviction and severe penalties." And the penalties include fines up to \$2,000.00 or imprisonment up to five years or both. The current "flap" to get this message to as many vets as possible has been occasioned by the fact that in recent months far too many guns have been used for something other than mantelpiece ornaments. Too many of them have found their way into the coat pockets of criminals. The National Firearms Act was designed specifically to prevent this very thing, and both the Internal Revenue and Treasury Departments are out to see that provisions of the law are complied with. Here are the types of guns that must be registered: 1. Any firearm designed or altered so that it is capable of firing more than one shot with one continuous pull of the trigger, such as a machine gun or machine pistol. 2. A shotgun or rifle having a barrel length of less than 18 inches, except 22 or smaller caliber rifles. A 22 or smaller caliber rifle must have a barrel less than 16 inches to require registration. 3. Any other weapon, except a pistol or revolver, from which a shot is discharged by an explosive, if such weapon is capable of being concealed on the person. 4. A muffler or silencer for any firearm. 5. A revolver or pistol with an accompanying shoulder stock.

To reduce further the crime hazard of souvenir firearms, the Alcohol Tax Unit is offering free services in rendering them permanently unserviceable. This is done by welding the weapon in a manner which does not impair its appearance or value as a trophy, but which makes it useless as a potential killer.

Weapons made unserviceable may be transferred legally without payment of the \$200 transfer tax.

Veterans and their families possessing firearms in any of the five classifications have been asked to communicate with the nearest district office of the Alcohol Tax Unit. Following are their mailing addresses:

No. 1 State St., Boston 9, Mass.

253 Broadway, New York 7, N. Y.

US Customhouse, 2nd and Chestnut Sts., Philadelphia 6, Pa.

Military Park Building, 60 Park Place, Newark 2, N. J.

Appraiser's Stores Bldg., Gay and Lombard Sts., Baltimore 2, Md.

408 Ten Forsyth St. Bldg., Atlanta 3, Ga.

431 New Post Office Bldg., Louisville 2, Ky.

2412 Buhl Bldg., Griswold & Congress Sts., Detroit 26, Mich.

734 New Post Office Bldg., Chicago 7, Ill.

Room 407, 1539 Jackson Ave., New Orleans 12, La.

329 General Post Office Bldg., Kansas City 8, Mo.

708 Minnesota Bldg., St. Paul, Minn.

535 Hynes Bldg., 820 16th St., Denver 2, Colo.

Custom House Bldg., 555 Battery St., San Francisco 11, Calif.

232 US Court House Bldg., Seattle 4, Wash.

### Foxholes for the Atom Age

On the basis of available evidence Air Matériel Command officials at Wright Field now believe that complete underground structures represent the highest development in achieving protection against air attacks.

By the end of the war, Wright technicians point out, the Germans had a total of 143 underground factories in production. Approximately 20 per cent of the entire capacity of the airframe industry, including virtually all of the V-weapons and nearly 60 per cent of aircraft engine and jet capacity were placed underground.

The most desirable sites were either the side of a hill or mountain inasmuch as they usually lent themselves to the installations of sewer systems; were less subject to difficulties arising from ground water; provided more adequate ventilation; and provided more effective exits and entrances for workers, equipment, and supplies.

The Kematen Works was dug into the side of a mountain and consisted of eight tunnels and cross passages. There the manufacture and assembly of ailerons and flaps for the ME 262s were undertaken.

The Mittlewerke and Nordwerke factories near Niedersachawerfen were situated beneath a steep, heavily wooded hill that rose almost 300 feet above the surrounding flat countryside. The main tunnels were approximately 30 feet wide and 24 to 30 feet high with nearly vertical walls and rounded ceilings.

Aircraft engine production was undertaken in a granite quarry near Budapest and at Neckarelz while sub-assemblies for the JU 88 were constructed in an unfinished tunnel 2200 feet long located in the outskirts of Berlin.

At Niedersachawerfen, the largest and most ambitious underground facility in the world, was located in the Harz Mountains. Here the V-1 and V-2 projectiles, aircraft rockets, parts for engine and rocket bombs were manufactured. Electrical tests were made on the V-2 rocket in one of the tunnels that was 75 feet high.

While the German experience clearly indicates that almost every type of small and moderate size plane can be produced underground, AMC officials say that no insight is afforded as to the potential suitability of underground construction of aircraft the size of the B-29 or B-36. The Germans had no planes of this size under construction.



Today, in many of the German mountain tunnels and caves, rust, due to water seepage is destroying the production equipment that was so hastily installed during the war. Similarly, tunnels were flooded completely. During hostilities sheds were required to shield the workers from water dripping from the roof, and from falling dirt and rocks.

The Germans experienced many other difficulties of underground manufacturing such as noise absorption, gasproofing, dust control, and others, with varying degrees of success. But, despite these obstacles, plus the harried and chaotic conditions under which they were working, AMC officials state that the Germans did achieve a surprising degree of success.

It is generally believed now that these underground installations, if adequately planned, could have afforded protection against any type of weapon used against Germany during the war, because of the enormous overhead cover possible and the existence of natural camouflage.

### Cadet Training for Civilians

The first Army Air Forces aviation cadet pilot training class since VE-Day to be open to civilians as well as to enlisted men from all components of the Army began July 1 at Randolph Field (San Antonio), Texas. Five hundred cadets were selected for the 52-week course which leads to a commission and a pilot's rating in the Army Air Forces.

A second class of 500 will begin training October 15, and a third class March 1, 1948.

Applicants, the AAF announces, must be unmarried male citizens between 18 and 26½, and must have completed at least two years of college study or be able to pass a rigid written test measuring the equivalent. Before assignment to classes, applicants will undergo thorough physical examinations and aptitude tests.

Cadets will be trained in the use of recently perfected radar and electronics devices, jet and rocket propulsion, Ground Controlled Approach landing methods and for duty in all types of aircraft including the Lockheed P-80.

The course is divided into three phases of training of which the first two, primary and basic instruction lasting approximately 35 weeks, are given at Randolph Field. The third phase, specialization in fighter aircraft or bombers, will be undertaken at Barksdale Field (Shreveport), Louisiana or Williams Field (Phoenix), Arizona.

Detailed information and necessary application forms can be obtained from any recruiting office, Army Air Forces installation or Civil Air Patrol Unit. The completed application form, accompanied by documentary evidence of the applicant's date and place of birth, three letters of recommendation and a scholastic record transcript, must be forwarded to the Commanding General, Army Air Forces, Washington 25, D. C., or to the nearest Army Air Forces Examining Board.

### So There, Tommy

Declaring that the British are doing a "beautiful worldwide selling job" on their jet engines, E. S. Thompson, manager of General Electric's Aircraft Gas Turbine Division, said recently that the combined developmental effort of all American aircraft engine manufacturers "is fully as good and has as much chance to produce results as the British program."

"Apparently the British national economic situation makes it mandatory that they build up their foreign markets," he said. "For this reason, if for no other, governmental restric-

tions on publication of facts about new British developments in this field are not relatively stringent."

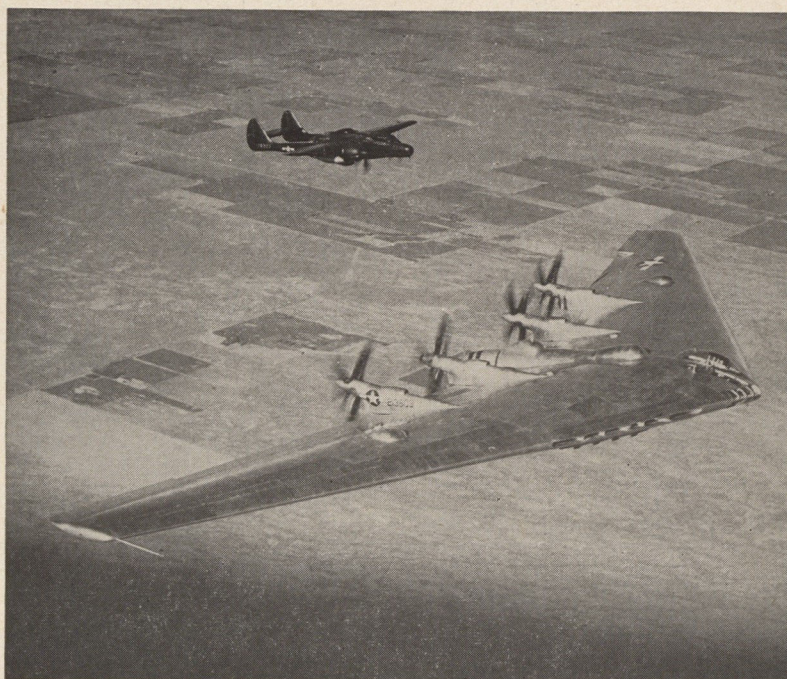
"If America is lagging behind in the jet propulsion field," he said in an interview, "it is solely because urgency forced industry to embark on a large-scale production program during the war without being able to devote the necessary time to fundamental research and development work on this new type of engine. During this period, the British devoted considerable effort to basic research programs. Such research work has now been in progress in this country for the past year, and I am confident that the results of the present program, even though delayed because of our all-out effort on production, will result in the development of jet and propjet engines far superior to those now in existence."

### Big Blow

A new type of supersonic wind tunnel, designed to test the aerodynamic characteristics of burning ram jet motors and other rocket type motors, will be built under the supervision of the Army Corps of Engineers at the California Institute of Technology, Burbank, California. The new tunnel, for which the expenditure of \$2,384,000 has been authorized, will be the first of its kind in the United States.

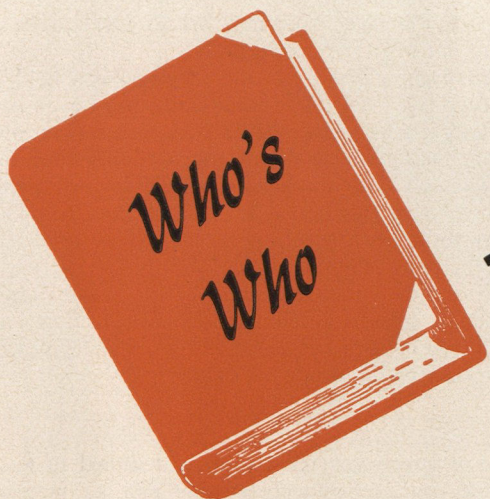
Located in a special building 50 by 150 feet in size, the testing section of the tunnel will consist of a flexible nozzle with a cross section 15 by 20 inches. With this nozzle it will be possible to test models large enough to include actual combustion, that is, up to 2½ to 3 inches in diameter. Powered by three motor driven air compressors each powered with a 4,000 horsepower motor and capable of producing a combined total of 171,000 cubic feet of air per minute, it will be possible to develop an air velocity of 3,600 miles per hour. An after cooler and auxiliary piping and valves will be necessary. It will also be necessary to install an absorber unit of approximately 400 cubic feet per minute and a component balance system will also be installed in the unit.

The California Institute of Technology was purposely selected as the site of the new tunnel as the Institute is a permanent educational center where advanced courses in jet propelled missiles and their component parts are offered by some of the foremost scientists in the country. Located at this school, the tunnel can be utilized by these scientists not only to instruct other scientific personnel, but also to carry on necessary vital research in the guided missile field.



The famed 172-foot Northrop XB-35 Flying Wing dwarfs the P-61 Black Widow night fighter. This type of unconventional bomber, being tested at Muroc Army Air Base in California, has a gross weight of 209,000 lbs, and is expected to have an extreme range of over 10,000 miles. Elimination of fuselage gives craft the performance of the new six-engined very heavy bomber class plane.





## in the AFA

### INTRODUCING

*Julian B. Rosenthal*

**A**BOUT a month after the Japs surrendered in Sugami Bay, a group of AAF officers, chiefly colonels and higher, gathered at New York's University Club to lay the groundwork for the founding of an organization aimed at keeping Air Force veterans in touch with each other. The odd man at that party was a lone PFC from Matériel Command, a one striper named Julian B. Rosenthal. But before the meeting broke up, the lone EM was awarded the job of casting the rough draft of the present constitution of the AFA.

Now that the infant he helped deliver is in its diaper stage, the former PFC does not sit in his comfortable law office and let the other nurses tend to its feeding. Currently the Assistant Secretary of AFA, he is prominent in the Convention Committee which will bring the gang together in Columbus late this Summer.

The law office that Julian occupies is quite unique. All of the active members of the firm are former armed forces personnel, mostly AAF. Rosenthal himself is almost a rarity, a Gothamite who was born in New York, on the Fourth of July, 1908, to be exact. His youth was fairly typical; he attended Speyer Grade School and De Witt Clinton High. His sole claim to fame was managing the soccer team.

From here he went to Columbia, thence to Fordham Law School. In the latter institution, he became a member of the only undefeated tennis team that Fordham ever had, a galaxy that contained the immortal Eugene McAuliffe.

Rosenthal graduated from law school in 1929, still too young to be considered for the bar. He went to work for the famed theatrical lawyer, Nathan Burkan, in whose organization he met Sol. A. Rosenblatt.

During his clerkship, Rosenthal continued his tennis interests, doing the summer circuits and meeting such competition as Frank Shields and Julius Seligman. He was finally admitted to the bar in 1931, and in 1935, he entered general law practice with Sol. A. Rosenblatt.

The association proved an amicable one, and was going fine when the Japanese decided to break it up. The smoke from Pearl Harbor had just about cleared away when the senior partner entered the AAF. (He emerged as Col. Sol. A. Rosenblatt, now AFA secretary.) He was followed by the third partner, Herman S. Rosenblatt, who liked the Navy better, and wound up as a Lieutenant Commander, Flag Secretary of the famed Task Force 58. Julian, being the father of a couple of boys, looked like a safe bet to remain civilian, so he was left behind to "mind the shop." He became a government appeal agent, operating with Selective Service, but like the doctor who couldn't cure himself, his "greetings" became effective the very last day that married men with children could have been called, 7 April, 1944.

After finishing basic training at Keesler Field, Rosenthal proceeded to Wright Field where he became a contract

writer in the procurement branch of Matériel Command. He was one of five EM who worked with fifty officers, all doing the same kind of work. He specialized in writing bailment contracts, special agreements whereby AAF-owned equipment could be loaned back to manufacturers for experimental purposes.

When Rosenthal began his work, it took between thirty and sixty days to get material cleared through bailment. He streamlined the procedure so that parts could leave the field within 24 hours of the time the bailment was OKed. Comment on this change came from topside. "Brilliant" was the observation. "The man who did this shouldn't be a mere private, he should be at least a PFC!" Comment or no, the only promotion Rosenthal ever got was his lone stripe that was awarded as a matter of routine when he completed his first year of service.

Later in his military career, the PFC was shipped to the Eastern Procurement District Office in New York, where he did the same kind of work as he did at Wright Field. While in New York, he was so impressed with the legal skill of his boss that he offered him a postwar job in his law firm.

If you ask Rosenthal why he never tried for a commission he will remind you that, had he gone to the Army's law school at Ann Arbor, he would simply have gone back to the same desk to do the same work. By the time Matériel Command's OCS allotment could have gotten down to him, he was in New York, and no man in his right mind would have disturbed that.



Former AAF Pfc Julian B. Rosenthal, drafter of the Air Force Association's constitution at his desk in New York's Radio City.



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# The Black Box

*None of the navigational devices you read about reduce the pilot's job. Flight Path Control may be the answer*

BY F. CLARK SMITH

**Y**ou read and hear a great deal these days about the development of navigational aids that are designed to bring an airplane safely through ceiling zero weather to the proper runway on an airport. Tragic stories in your daily newspapers, of crashes that occurred because the pilot missed the runway or ran out of gas trying to reach an alternate, define as well as anything can, the need for some such aid.

But of all the devices you hear about, none reduce the job of the human pilot. There are scopes to watch and interpret with Teleran and Navar. There's an extra indicator to look at with ILS, and ground crew instructions to listen for with GCA. Duties are added to those of an already busy pilot, and they're added at a critical time—at a time when the pilot should be most relaxed to do a better job of flying his plane through the vagaries of soupy weather to a safe landing on the ground.

A device known as Flight Path Control (FPC) designed by Eclipse-Pioneer Division of Bendix Aviation Corporation, has been developed, which will reduce the duties of the pilot during this critical period. It will reduce his duties to the extent of automatically putting his airplane on a landing approach radio beam, including proper angle of descent, automatically bracketing the exact center of this beam, and automatically correcting for any drift corrections. It will fly the airplane for the human pilot, from the time he wishes to start an approach, to the point where he releases the automatic system and manually flares out the glide for a landing.

In operation, FPC depends upon the Eclipse-Pioneer PB-10 Electronic Pilot for normal automatic flight, and upon the standard Instrument Landing System (ILS) equipment for a radio beam path to follow. Heart of the FPC system is a Flight Path Computer which translates the ILS radio beam signals into terms of automatic pilot control, including coordinated throttle movement with elevator action to maintain constant airspeed throughout the landing approach. Top figure identifies and locates the Automatic Pilot and Flight Path Control units in an airplane. The dotted lines interconnect FPC components while solid lines identify the Automatic Pilot system.

Before considering how and why FPC operates, let's first briefly review the equipment that provides the reference radio beam. Primarily, the ILS system consists of two transmitters on the ground, each of which sends a set of radio beams up into the air. One set defines azimuth and is referred to as localizer; the other defines angle of approach and is referred to as glide path. The two sets of beams are projected so that they intersect at right angles, with this line of intersection defining a very definite path to the ground. Radio equipment in the airplane picks up these beam signals and relays them to a cross pointer meter mounted on the instrument panel of the airplane. The cross pointer meter consists of a vertical pointer for registering localizer signal, and a horizontal pointer for registering glide path signal. When the two pointers cross in the center of the dial, the airplane is on the exact intersection of the localizer and glide path beams. In flying the ILS system, the human pilot flies the airplane to keep these pointers centered. With Flight Path Control, this is done automatically.

Now that we have an idea of what we've got to work with, let's take an airplane up and see how the system operates in making an approach. As the plane flies toward the airport of our destination, the PB-10 Automatic Pilot is flying the ship. The human pilot obtains the inbound heading and frequency of the radio beam from the tower. He tunes his radio receiver to the proper frequency and turns the airplane by means of the autopilot controller to intercept the beam. As the plane enters the field of the beam, the localizer pointer of the cross pointer meter will deflect. The human pilot then turns the airplane to the inbound beam heading and rotates the sequencing switch of the FPC system to "Localizer" position. The airplane will automatically start a coordinated turn in the direction of the beam as the Flight Path Computer starts ordering the automatic pilot to make the turn.

Design of FPC is such that as the airplane approaches the beam, the angular displacement between the airplane and the beam will gradually diminish so that bracketing will be confined to a series of small automatic turns. An integration device, which is energized as the plane gets within approximately one degree of the beam, will correct for any off course wind conditions and cause the airplane to crab so that it will track the localizer beam.

With the airplane now established on localizer, it is still necessary to locate and track the glide path beam. (The approach was started at an altitude that would permit the airplane to become established on localizer before it intercepts the sloping glide path beam.) As the plane enters the field of the glide path beam, the glide path needle of the cross pointer meter will start to deflect. As it nears the center of the dial, the human pilot will rotate the sequencing switch to "Localizer and Glide Path" position. The Flight Path Computer is now receiving the glide path beam signal as well as localizer signal, and will order the automatic pilot to bracket that beam.

As down elevator is automatically applied for the descent, throttles will be retarded simultaneously to maintain constant airspeed. Bracketing will occur in much the same manner as it did on localizer, but in the vertical plane.

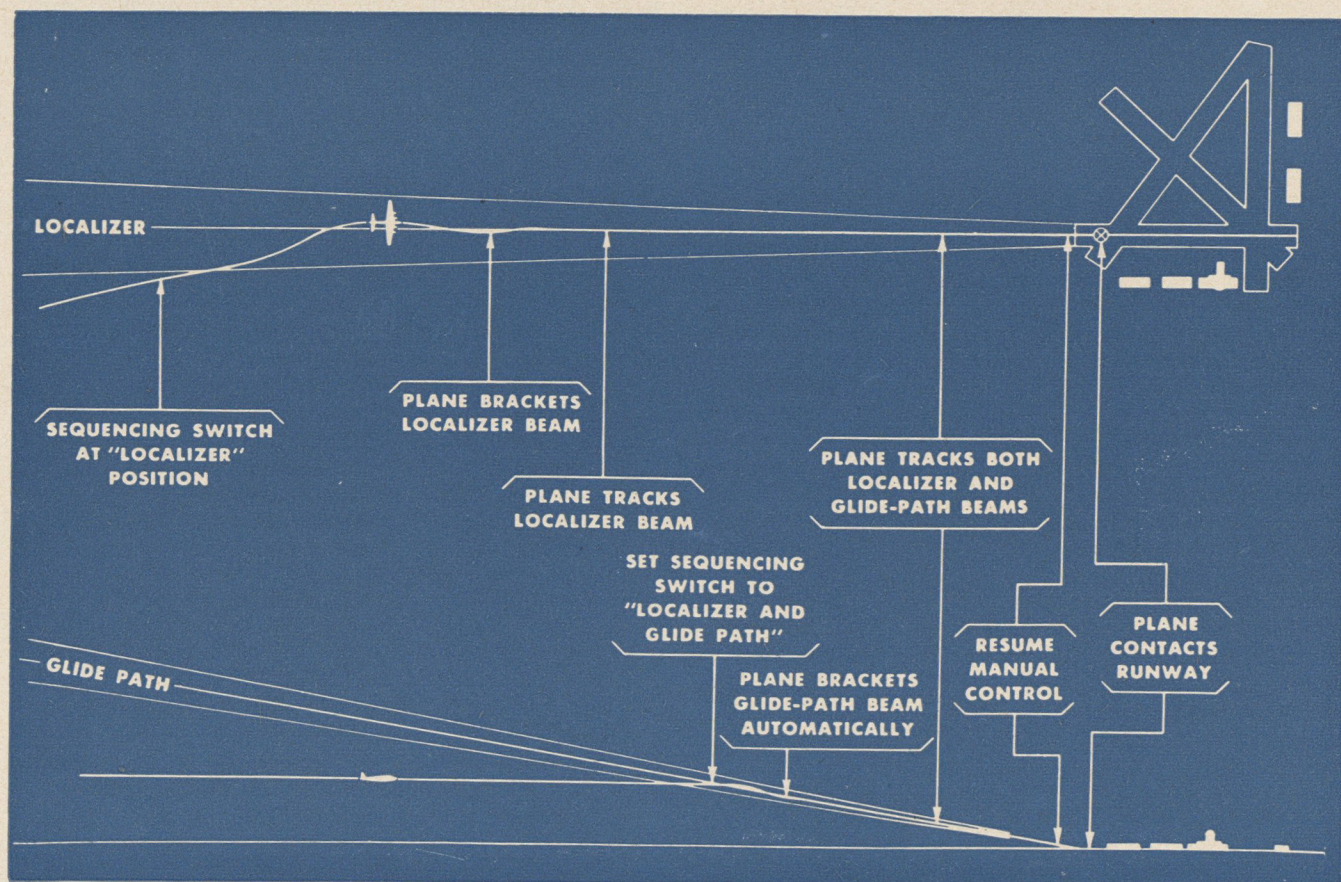
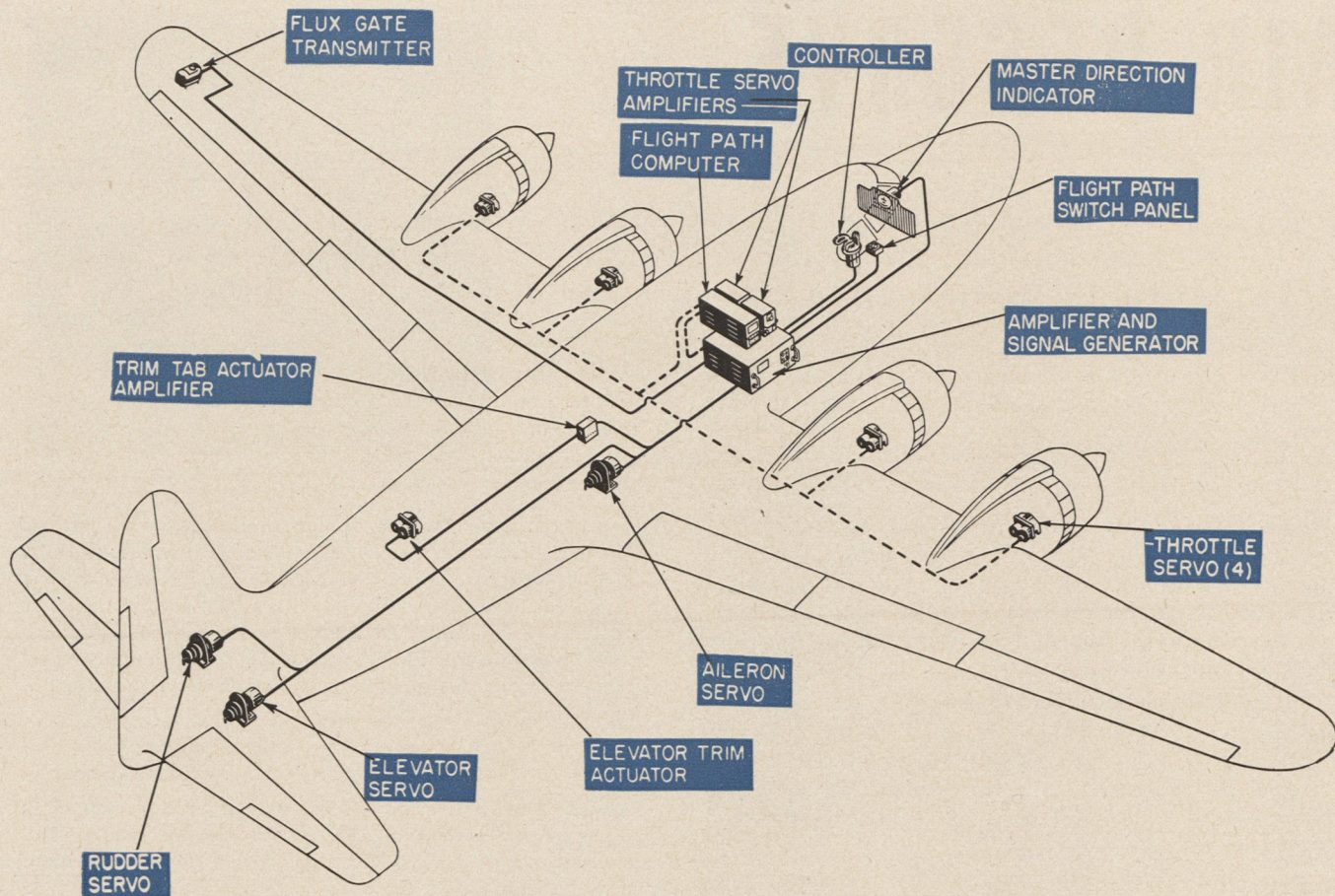
The airplane is now tracking the intersection of the localizer and glide path beams, and will continue to do so as long as FPC remains engaged. However, the human pilot will resume manual control by pressing the pilot's release switch on the tip of his wheel to disengage automatic control, as the plane breaks through the overcast and approaches an altitude over the runway where it is convenient to flare out the glide and land. Bottom figure summarizes the action of an airplane in entering, bracketing, and tracking both localizer and glide path beams, and indicates where manual control is resumed.

In the event that it is necessary to go around, the sequencing switch is turned back to "Localizer" position, and the automatic pilot will return the ship to straight and level flight with FPC keeping the plane on the outbound localizer beam. Though the throttles are tied in with the automatic system, they may be operated manually at any instant.

The importance of FPC is enhanced by the fact that it can also be used for flying VHF ranges. Beam entry and bracket-

*(Continued on page 49)*

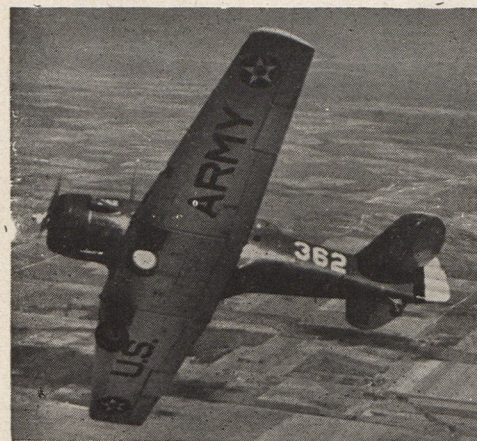






# AIR RESERVE

*Basic information required by former AAFers for participation in the Air Reserve Program is presented here in question-and-answer form*



**Question:** *How do I qualify for membership in the Air Reserve?*

**Answer:** You are qualified to hold the same rank, or grade in the Air Reserve that you held when honorably discharged from the Army of the United States, providing you meet the physical requirements.

**Question:** *What about Flight Officers?*

**Answer:** Former Flight Officers, Warrant Officers, and enlisted personnel of the first three grades, with war service may be appointed as second lieutenants without attending an Officer Candidate School when their wartime experience clearly establishes their fitness.

**Question:** *Does membership in the Air Reserve require participation in the Active Air Reserve?*

**Answer:** No. Reservists, both officer and enlisted, must volunteer in order to serve with the Active Air Reserve.

**Question:** *What are the requirements for flying as an Air Reservist?*

**Answer:** You must meet the following requirements: (a) hold a currently valid aeronautical rating, (b) be physically qualified, (c) be commissioned or enlisted in the Air Corps Reserve, (d) be technically qualified for flight duty in the specific type of equipment involved, and (e) be a member of the Active Air Reserve.

**Question:** *Is there a place for other crew members besides pilots in the Air Reserve Program?*

**Answer:** Positively. All types of Air Reserve personnel will be needed to form the Air Reserve units. Training for crew members other than pilots and ground personnel will start later. This is because of the necessity to start pilot training first since the maintenance of flying proficiency is more easily dissipated.

**Question:** *May I belong to both the Air Reserve and the Air National Guard?*

**Answer:** No.

**Question:** *Am I liable to be called back to duty at any time, possibly against my wishes?*

**Answer:** Only in the event of a national emergency.

**Question:** *If I am enlisted in the Regular AAF, but hold an Air Reserve commission, may I participate in the Air Reserve Training Program?*

**Answer:** Yes, in your off-duty hours you will be on the same status as any Air Reserve Officer pilot, or Air Reserve non-rated officer.

**Question:** *What part does the Regular AAF play in the Air Reserve Program?*

**Answer:** The Regular Army Air Force has as one of its pri-

mary missions the training of the Air Reserve. This job has been delegated to the Air Defense Command which, through six numbered Air Forces covering the entire United States, is maintaining regular AAF Base Units that are the nuclei of Air Reserve Training Detachments. In addition, Air Reservists will be trained at all regular AF establishments by assignment of Air Reservists to positions for inactive status on-the-job training.

**Question:** *Briefly, what are the missions of the Active and Inactive Air Reserve?*

**Answer:** The Active Air Reserve will provide trained units for use in the event of an emergency. The Inactive Air Reserve will act as a reservoir of specialized officers and men.

**Question:** *What type of training is planned for non-pilot personnel?*

**Answer:** Training will be conducted with all modern types of arms and equipment. Some training will be by means of classroom instruction and training devices. Correspondence courses are in the process of preparation. Assignment of selected officer and enlisted personnel to staff and Technical courses at established Air and Ground Service Schools is also being planned.

**Question:** *How can an Air Reserve command pilot, who has been physically disqualified for flying as a result of an accident, participate in active flying now that he is fully recovered?*

**Answer:** A flying officer whose aeronautical rating has terminated can be re-rated only by appearing before a Flying Evaluation Board.

**Question:** *If an individual has lost all his records, including Form 5, Form 64, and Form 66-2, how are his qualifications determined?*

**Answer:** Individuals may obtain copies of their Form 5 from the CG, AAF Winston-Salem, N. C., Attention: Chief, Flying Safety. Copies of Form 66-2 will be secured through the office of the Adjutant General, War Department, Washington, D. C., by the Air Force Commander. To obtain Form 64, the Air Reserve Training Detachment Commander must request copy from station at which original was accomplished.

**Question:** *How does the Army Air Reserve Program compare with the Navy Air Reserve Program?*

**Answer:** The Navy Air Reserve Training Program is composed of a Ready Reserve which draws pay, and a Standby Reserve which is entirely voluntary. The Air National Guard is similar to the Navy's Ready Reserve while the Army Air Reserve can be compared with the Navy's Standby Reserve Training.

*(Continued on page 46)*



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## tech topics

### Asphalt Rockets

The contents of the solid-fuel rocket, developed for jet-assisted take-off by the Aerojet Corporation of California, was finally revealed as containing a material usually used for paving streets, a variety of asphalt. This differs from the dangerous fuming nitric acid and analyne combination developed by the Germans and used in some of their early experiments. JATO shells have been developed as a means of securing additional thrust for brief periods in order to get heavily loaded planes airborne in a shorter space. The bi-fuel rocket, originally used for this purpose was dangerous to handle, and therefore, considerable experiment was launched to find a solid fuel that could be used.

The best formula evolved by the researchers at Cal-Tech who made up the Aerojet personnel was a black plastic mixture of asphalt, a chemical oxidizing agent and a light oil. This compound was packed tightly inside the rocket tube. The problem was to find a particular kind of asphalt which would provide certain qualities which would promote uniform burning. Most of the common asphalts which were tested showed poor physical properties. When the rocket burned, these materials tended to separate from the sides of the JATO casing, crack, or slump with changes in temperature, thus exposing too much of the surface to burning and creating jumps in gas pressure.

To aid in solving the problem, the famed aerodynamicist, Dr. Theodore von Karman, called in the Texas Company, world's largest asphalt producer. This source uncovered for them a special asphalt crude, which possessed the correct steady burning properties.

This form of solid-fuel rocket has been approved by the CAA as an auxiliary power plant for commercial aircraft after extensive test by both the Army and Navy.

### Auto Chute Opener

One of the major problems in air safety in high-speed aircraft stems from the fact that the pilot would have to escape from the plane at a speed in excess of safe opening velocity. Opening shock at modern pursuit speeds is in excess of normal human resistance to impact. It is necessary, in high-speed escape, to fall clear of the airplane and delay opening the parachute until the falling body has had an opportunity to slow down. When flying at high altitudes, it is advisable for the escaping pilot to drop to the regular air levels in order to be able to breathe normal density air. For this reason, it became necessary for the AAF to develop a system for automatically opening the personnel parachute.

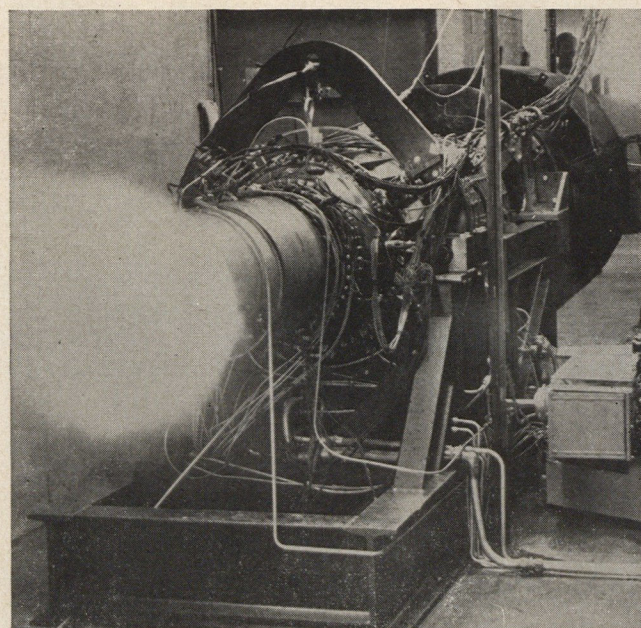
The original auto-opener was devised by the AAF. A commercial version of the machine, built on altitude-timing prin-

ciple, has been produced by the Irving Air Chute Company of Buffalo, N. Y. The device can be pre-adjusted to open at a desired level. Most of the time, it is set for 10,000 feet so that a pilot flying at 40,000 feet will fall clear three-quarters of the way.

The timer is fully automatic and is independent of the manual ripcord, so that the chute can be operated by pulling the ripcord in case the operator wishes to open the parachute before the opener is actuated. The device weighs only two and three-quarter pounds, is 1.75 by 5.125 by 3.5 inches. Its main components consist of an adjustable altimeter, a timing device and the cord opening spring and tunnel.

### No-Drag Antenna

A leading headache in high-speed military aircraft has been the drag and weather problems surrounding the radio aerial system. External wiring not only produced power-consuming drag, but tends to pick up ice under certain conditions. Engineers at Wright Field have developed several ideas which circumvent both of these problems. One is the installation of exciter coils between the inboard engines of a multi-engine design and the fuselage, which energizes the entire wing structure, so that the whole airfoil acts as an antenna. This is



Test running the Menasco XJ-37, most powerful US jet engine, which produces as much power as a locomotive, 5000 lbs thrust.



considered a great improvement over the old trailing aerial, which not only added resistance and picked up ice, but produced the annoying "frying eggs" noise in the receiver as a result of its oscillation.

Another development is a flush-mounted slit antenna, which is mounted in the side of the gunner's position on the B-17, but which is adaptable on almost all types of aircraft. Intended for the homing antenna, it can be slid out when required, then retracted inside the fuselage.

### Most Powerful Jet

The AAF's latest power plant, believed to be the largest in production, was revealed recently at the Menasco Manufacturing Company in Los Angeles, Calif. The new unit, the result of six years of research and development, produces 5000 lbs of thrust which, at 350 mph, is the equivalent of that many horsepower.

The new unit is of axial flow type, using the latest in compressor and afterburner equipment. Its designation is the XJ-37. It was originally planned by Lockheed Aircraft Corp., by Nathan C. Price, who moved over to Menasco when the project was transferred. The XJ-37 basic unit can be used either as a turboprop or turbojet installation.

### Track Landing Gear

A landing gear system roughly resembling the track setup of tanks and self-propelled guns is being installed on a Fairchild C-82 Packet. The new equipment is designed to allow heavy cargo and operational aircraft to work from unprepared flying fields close to the air head.

The C-82 is the first large airplane thus equipped. A track type undercarriage was used experimentally by Breguet in France in the middle twenties. In 1941, a track gear was installed on the main legs of an A-20. The Packet installation is the first to have track gear on the nosewheel as well as the main shoes.

The gear itself, frequently referred to as the "flying runway," consists of a continuous rubber belt stretched over rollers and held in proper tension by boogie wheels, like a tank suspension system. The C-82's legs have belts nineteen inches wide on the main legs and fourteen inches on the nose. The belt itself is made up of a steel cable matrix, covered in synthetic rubber.

Use of the new system reduced the flotation pressure of the total weight of the loaded airplane divided by the tire

surface contacting the ground, from sixty lbs per square foot on the conventional C-82 to twenty lbs. Application of this gear will enable heavy aircraft to land close to the scene of military action without having to wait for the engineers to build finished fields.

### Safer Crash Helmet

Pilots attempting to crash through the sonic barrier in craft like the XS-1 and the Douglas Skystreak have been wearing a new type crash helmet developed by scientists of the medical aviation department of the University of Southern California, Dr. Charles F. Lombard and Mr. Herman P. Roth. The new headgear is designed to protect the pilot's cranium in the ordinary pounding that it takes in buffeting at high speeds, as well as in possible accidents.

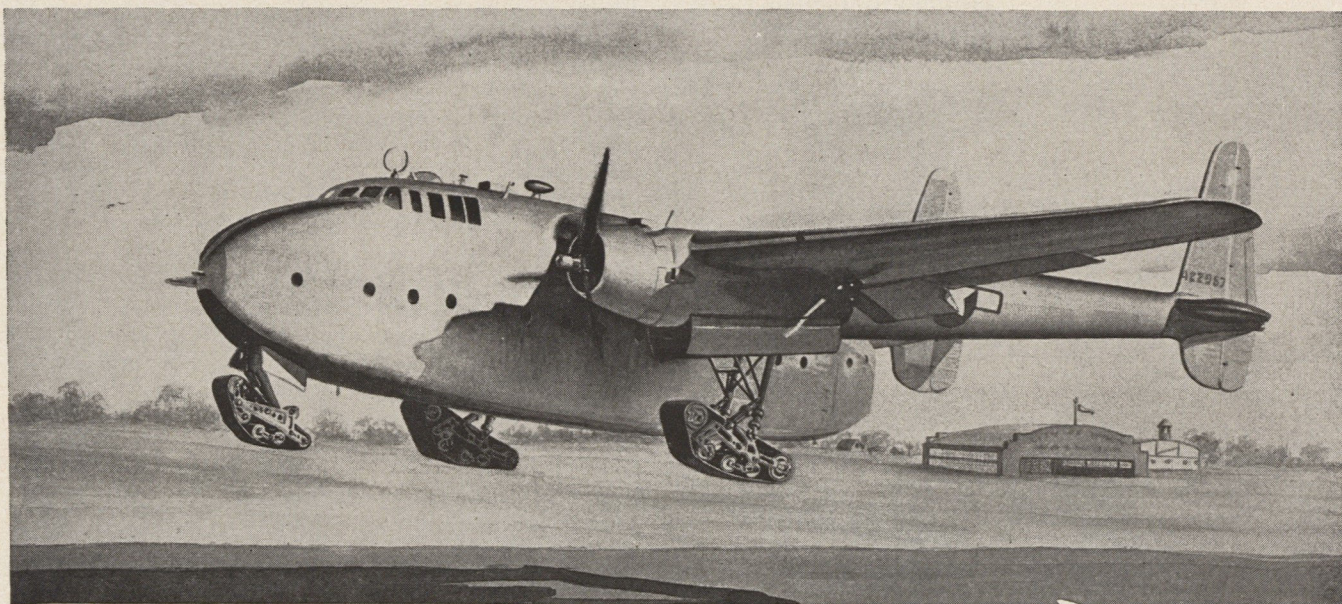
The new headpiece is made up of an outer shell of compressed fibre glass, a material which, during the war was used as body armor by aircrews. A plastic-bandage casting is made to the head of the particular pilot, to make a custom-built liner that fits the head exactly. Between the liner and the shell is an absorbent layer of energy-absorbent cellular cellulose acetate, made up in small cubes. This material crushes on impact, but does not rebound as does foam rubber. In addition to protecting the outer bone surface of the skull, the absorbent material shields the brain itself from the damaging shocks of supersonic flight.

### Supersonic Models "Flown"

The first accurate measurement of a supersonic wing's flight characteristics was attempted recently by Lockheed Aircraft's engineers in Cal-Tech's supersonic wind tunnel. This tool was recently made high-speed by the installation of the Beman-Weaver "bump," a curved obstruction set into the tunnel's floor, which increased the speed of airflow in a normal wind tunnel.

The first wings to be tested were brass models of swept-back supersonic design. In the tunnel, normal operating speeds which were somewhat under 700 mph were jacked up to 850 mph by the use of the "bump." The conventional wings actually broke up under the shock waves, but the swept-back design indicated that it could withstand the acceleration of Mach 1.1. The problems which will be explored in this altered tunnel will involve improving control of the delta type supersonic airfoil.

(Continued on page 49)



Artist's conception of the track-type landing gear being installed on the Fairchild C-82 Packet. This system will enable the giant

cargo craft to land on soft earth and unimproved airstrips, close to the air head during the advanced types of military operation.



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# Book

**You Can Learn To Fly.** By Beverly E. Howard and William D. Strohmeier. Prentice-Hall, Inc., New York.

If there were ever two men qualified to write a book on the business of learning to fly, it's these two. "Bevo" Howard is the National Aerobatic Champion, operator of one of the nation's best-known flying schools, a former airline pilot and a director of the Aeronautical Training Society. Bill Strohmeier is a flying instructor of wide experience, one of aviation's top publicists and an aviation writer of no mean repute. Together they have forged a book meant to provide flying instructors with a manual for private-level flying students.

The major importance of this particular book is the fact that it is aimed at a particular audience and stays on the target. It is obviously not an all-inclusive flying library. It contains a well-rounded collection of information that the average private pilot will require for his first couple of hundred hours. It tells him how to select a flying school, what generally to expect in his pre-solo instructions, and acquaints him with the important fact that his instructions begin rather than end with his first solo flight.

The material is typical—it handles the primary aerodynamics and structures, the actual airmanship, navigation, meteorology, air law and license requirements. It does not neglect basic safety regulations or the problems involved in owning and operating an airplane. The importance of the book is the style and level at which it is handled. Both of these men have wide experience in the field of instruction and operation, and the book is written at the particular level and in the atmosphere in which the private flyer will live. Even to old-timers and instructors, it will make good reading.

**Mechanical Vibrations.** By J. P. Den Hartog. McGraw-Hill Book Company, New York. Third Edition.

Since 1934, this work by the professor of Mechanical Engineering at Massachusetts Institute of Technology has been a standard work on the subject of mechanical vibrations. In the third edition, the work is brought up-to-the-minute with an added chapter on helicopter ground vibrations, and the general discussion of high-speed flutter has been expanded to cover some of the problems emerging from supersonic flight.

**Democracy's Air Arsenal.** By Frank J. Taylor and Lawton Wright. Duell, Sloan and Pearce, New York.

The authors have collected pictorial evidence of the job that the aviation industry performed in forging the victory over Germany and Japan. They start out by proving, from the lips of the defeated enemy, that it was American Air Power that brought them to their knees. They show how this power was used in actual battle. Then, they proceed to outline the manner in which the nation's industrial strength was marshalled behind the unprecedented job of bringing our air arm, from fourth place among the nations to the top of the heap, even if it was just for a little while.

The importance of this book is chiefly historic. It is an over-all work, intended as a permanent industry record of achievement, definitely a library piece. At this date, it is a sad reminder of how far the industry that made victory possible has fallen since the last bomb detonated.



# Reviews

**Air Transport At War.** By Reginald M. Cleveland. Harper and Brothers, New York.

The "elder statesman" among aviation writers, Rex Cleveland, has laid down a scholarly yet exciting record of the job that the air transportation industry performed during the war. He starts it where all good reports should start, at genesis. This was the hour that, on the urgent plea of "Hap" Arnold and the head of the Air Transport Association, Edgar Gorrell, the late President Roosevelt tore up the executive order which would have taken over the American air transport industry, planes, men and all. This left the individual airlines free to cooperate in the traditional fashion.

The results are history. The airlines did a record job, plugging what appeared to be an interminable gap until the Army and Navy set up their own transport system. Then they provided both key personnel and counsel out of their vast experience, plus holding up their part of the air cargo situation as it affected domestic civilian production.

The book covers the planning and construction stages of the job of covering the planet with an airline net. Operated by a joint airline military team, it brought every American on military duty within less than a week's shipping distance of the domestic source of supply.

Blended with the information of who's and how's are numberless colorful and human stories from the men who flew gas to the beleaguered 14th Air Force, shell fuses to the waiting battlefield in North Africa and medical supplies into New Guinea. Besides being a first-rate record of an important phase of the war, it's good reporting and first-rate reading.

**The Air Weapon 1914-1916.** By John R. Cuneo. Military Service Publishing Company, Harrisburg, Pa.

This is the second volume in a most comprehensive study of the use of air power in warfare. This covers the formative period, the first two years of the war, when the airplane was chiefly a reconnaissance platform, and the doctrine of the airplane as an offensive weapon was considered by only a very few radical military minds.

For example, the Marne campaign of 1914 is discussed rather thoroughly, and the entire historic discussion of the success or failure of the airplane as a recon vehicle is thoroughly aired, in the light of opinion by rabidly anti-air authorities like Hoffman Nickerson, or the equally ardent pro-air advocates, like Generals Arnold and Eaker.

The importance of this rather monumental undertaking (a two year period of comparatively small aviation activity gets 377 pages less copious notes appendices, etc.) is the fact that it reviews military history which was written by "old guard" writers in the light of another war and the intervening period of "peace." For instance, the author rechecks the Battle of the Somme, showing how, as early as 1916, the gaining of air supremacy over an area was the eventual straw that tipped the balance.

Probably the most important service the book performs is the connections it establishes between wartime events and postwar planning. For instance, it establishes that the US Navy's dirigible program was influenced to a large extent by the performance of the German lighter-than-air units.

## BOOKS OF ALL PUBLISHERS

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## AIR RESERVE

(Continued from page 38)

**Question:** Can the Air Reservist attend service schools such as the Air University at Maxwell Field?

**Answer:** Yes, Air Reservists will be offered the opportunity to increase or refresh their military education providing they meet certain qualifications which are announced as quotas are allocated to numbered Air Forces.

**Question:** When do I get to fly?

**Answer:** Pilots, if they are physically qualified, can fly as soon as they are checked-off in the type of aircraft assigned to their Air Reserve Training Detachment, if they have been assigned to or are undergoing selection for assignment to an Air Reserve T/O Combat Type Unit.

**Question:** What type of aircraft are these Reserve Detachments using?

**Answer:** Air Reserve Training will be conducted in AT-6, AT-7 and AT-11 type aircraft.

**Question:** Will I have to fly during the week?

**Answer:** No, but you may if you have time. Aircraft will be available seven days a week.

**Question:** Are there any flying requirements to be met?

**Answer:** Yes. Reservists will be expected to fly a minimum of four hours per month as a pilot. A maximum of ten hours per month or eighty hours per year is authorized.

**Question:** Can rated officers, other than pilots, actively participate in flying at Reserve Detachments at the present time? If so, what must their qualifications be and what is the administrative procedure?

**Answer:** Yes. Qualifications and procedures are the same as for pilots.

**Question:** Will any heavy bombardment type aircraft be available for use of Air Reserve pilots?

**Answer:** Not for the present, but it is planned to equip Air Reserve Units with tactical type aircraft in fiscal year 1948, if appropriated funds will permit.

**Question:** Will Reserve personnel be required to wear uniforms while participating in aerial flights?

**Answer:** Yes.

**Question:** Will flying clothing be available for the use of Reserve personnel?

**Answer:** Yes, flying equipment will be furnished.

**Question:** What "check-out" procedure is required to qualify for flying in the various aircraft available?

**Answer:** Minimum training requirements have been set up in ADC Regulation 50-1, including familiarization and maintenance, briefing, transition and orientation.

**Question:** What about Air Reservists who are presently employed as airplane pilots?

**Answer:** A recent change of policy now authorizes them to fly and participate in the Air Reserve program to the same extent as all other Air Reservists.

**Question:** Will I be permitted to fly at other stations than the Air Reserve Detachment with which I am registered as an Active Reservist?

**Answer:** Yes. When you have completed flight check at your "home" Reserve Detachment, you will be furnished an identification card, Form ADC-OT2, which when presented, authorizes the Commanding Officer of any Air Reserve Detachment of the Air Defense Command of United States to permit you to participate in flying training at his detachment.



## WHAT PRICE AIR POWER?

(Continued from page 24)

million per year, none too much to preserve the skills of the pilots and technicians out of the war. But after a series of cuts, the whole Army Reserve got only \$56 million for 1947. The Air Reserve was supposed to have received \$40 million but came out with only \$18 million after an economy cut which happened to light on that item. After a delay in the Air Reserve program for many months, the fiscal juggling in the upper brackets virtually destroyed it.

The result was a string of broken promises, vastly destructive to morale and prestige. First it was promised that there would be 130 bases for reserve flying. Only 70 were activated. Then, without warning, 29 of these were closed and the reservists were left with only 41, or less than one per cent of the airports in the United States. Few live within reach of these fields and planes are provided for only a few of these. While an effort is now being made to permit volunteers to train with regulars at all the AAF fields, numbering some 200, the vast majority of the 400,000 members of the Army Air Reserve are still without a program.

By contrast, the Air National Guard, though it is having its troubles, has a far better deal for its comparatively few members. But the Navy tops them all with a fully organized program, equipped with modern planes and financed by \$70 million for the past fiscal year. Don't blame the Air Force. Its plans were right but were stifled by the budget makers and the policy makers higher up.

Though aircraft procurement funds may be somewhat more than for the past twelve months, the very heavy bomber program is getting under way at high unit cost. What's left over will spread very thin indeed, especially since production costs continue to mount so each of Uncle's dollars buys less and less.

These are simply a few of the known facts that appear on the surface. There is much more that can not be told as long as the AAF is gagged, more than any other branch of the government, on all budget matters.

Plainly, freedom of budget making is the most urgent need of the AAF. The merger bill does not solve the program altogether as AAF requests would be integrated with the program for the armed services as a whole—for air, land, and sea. But the right of the AAF Commanding General to present his own figures directly, rather than through War Department channels, can make a great difference.

Beyond that, in the months to come, it is most urgent that the public be given a better understanding of the situation. The average citizen thoroughly believes in air power from the headlines in the late war. But he thinks he still has enough protection. He doesn't know that we stand in third place to Britain and Russia. He is not aware that the planes on the drawing board today will not be flown in any numbers for years hence so that any lag in development will show up as a weakness perhaps five to ten years from now, while a potential enemy can plan to be ready then.

It is all a matter of money and of the insistence of many people that Congress pay the installments on air power as our national life insurance. If every veteran will act as a committee of one to get that story across, the 1949 budget which will be published next January will be more nearly adequate and there will be strong backing for the correction of any deficiency. If we wait until Congress is ready to vote, the AAF will continue to be underfinanced. The time to start is now.

## ARE YOU COMING TO THE CONVENTION?

National AFA Headquarters is trying to get a "line" on the number of members who will attend the convention in Columbus September 15th and 16th. If you are planning to join the gang fill out this coupon and drop it in the mail today. Your signature doesn't commit you one way or another. Nor will failure to send a coupon mean that you will be any less welcome. We are just trying to get a rough estimate so that housing and other arrangements can be made accordingly. Thanks.

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## HOWARD HUGHES

(Continued from page 16)

Hughes Flying Boat, twice as big as the plane originally planned, should be four times as much.

Yet the Hughes Flying Boat has been completed at less cost per pound than that of any other large airplane prototype built in recent years.

Actually the cost of the Hughes Flying Boat to the government is only the contract figure of \$18,000,000—Hughes has invested \$6,000,000 of his own money to complete the project.

Years of experience gained by the Hughes Tool Company in producing rock-bit drills to make possible recovery of billions of gallons of oil from the earth's depths proved to be of invaluable aid to Army Ordnance in the war effort. Hughes was the army's largest single supplier of cannon. Hughes staffed and operated the Dickson gun plant at Houston, the only plant outside the Army's Watertown Arsenal for the centrifugal casting of cannon. Hughes' Dickson plant turned out 16,958 gun tubes throughout the war, and developed new methods which greatly expedited production and general progress in the science of gun-making.

In other plants and facilities, the Hughes organization turned out 14,766 landing gear struts for military aircraft, 929,320 six-inch shells, radar antennas, aircraft interphone systems and other devices, many of them still covered by Army and Navy secret or confidential classification.

Despite the drain on manpower and equipment caused by his company's expansion into large-scale operations for war, the Hughes Tool Company increased production of rock-bit drills until annual output was nearly double prewar years. With the Hughes rock-bit drill, oil wells have been drilled to a depth of nearly 17,000 feet, opening up new and urgently needed petroleum reserves which could not have been tapped through any other method of drilling.

In addition to producing war-important material, Hughes

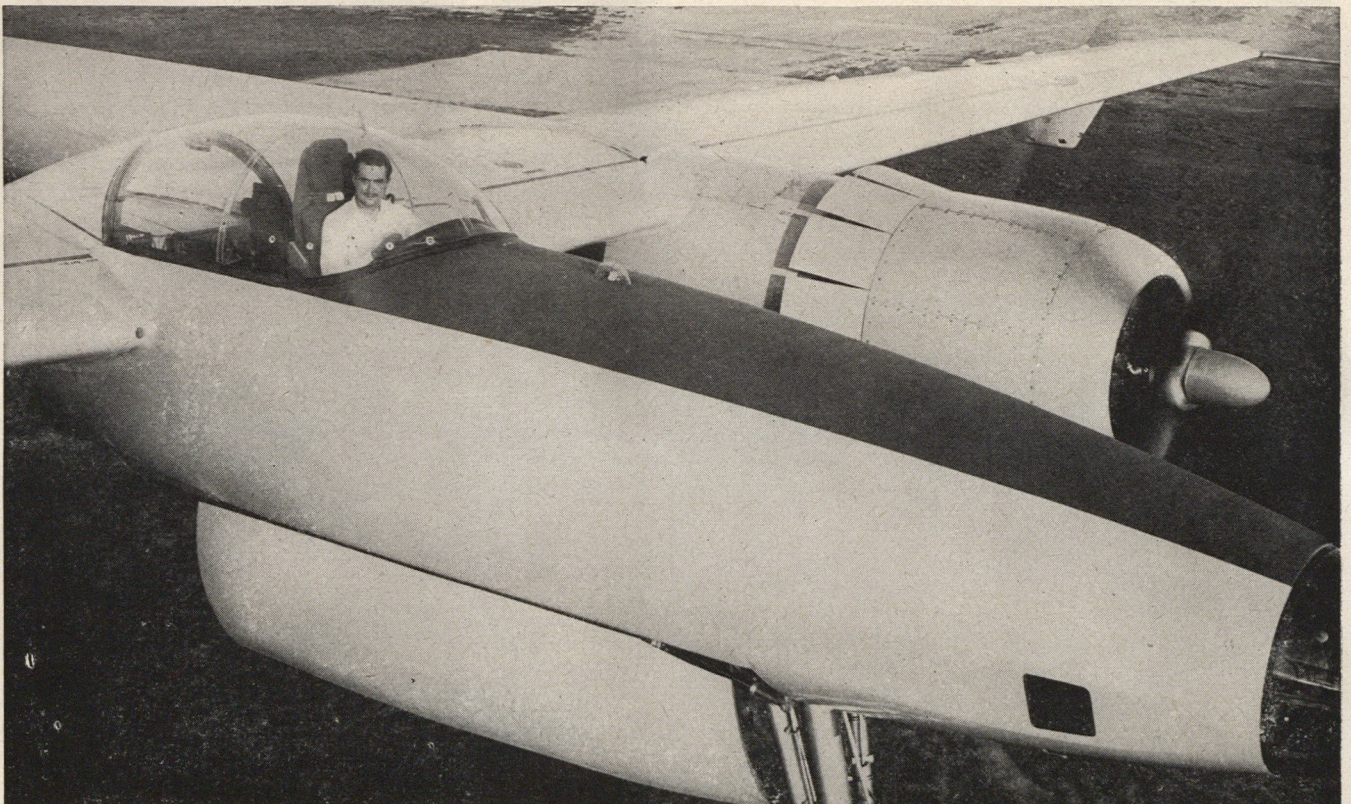
mobilized his TWA airline facilities to the fullest in the war effort. First American airline to operate trans-Atlantic flights under the Air Transport Command, TWA also established foreign routes in military service, months before any other domestic airline. TWA in foreign air transport war contract operation flew a total of 136,669 passengers a total of 529,180,240 passenger miles and operated more than 9000 transoceanic flights.

With Hughes' authorization and guidance, TWA undertook for the armed forces an enormous wartime training program which included training of four-engine bomber crews, flight training for Air Transport Command crews, training of ground crews, mechanics and radio operators. A temporary modification center operated by TWA completed modification work on a total of 440 military aircraft to help prepare them speedily for military operations during the early months of the war. TWA also trained air crews in its newly developed method of "pressure pattern flying."

Early in May, Hughes, piloting a TWA Constellation, demonstrated a simple, lightweight low cost radar warning device developed under his direction and found highly successful in exhaustive tests. The device warns the pilot, by a brilliant red light and a warning horn the instant the airplane comes too close to the ground, or any building, bridge, mountain, aircraft or other obstacle, regardless of darkness or weather conditions.

Hughes announced that his TWA line will be the first air carrier in the world to use radar for its fleet of passenger planes. Hughes will make the radar device available at cost to other airlines in the United States desiring its use, he said. "I believe this device will be of great assistance in our efforts to eliminate the type of accident which received so much publicity last year," Hughes said in launching his newest contribution to aviation.

After nearly losing his life in crack-up of the first XF-11, Hughes came back to make successful test flights in sister ship. XF-11 was designed and built by Hughes in cooperation with Air Force.





## TECH TOPICS

(Continued from page 43)

Something totally new in airline heating equipment will be installed in the new airliner Martin 202, a system known as Rador which will provide passengers with localized control of ventilation and heating, so that the seat in one part of the aircraft will not have to suffer from relative position to the main ventilating control system.

Rador is manufactured by the Vapor Car Heating Company of Chicago. The system consists of a number of strategically located electronic thermostats which make a radar-like search of the cabin and report deviations in temperature to two gasoline heaters and a vapor control system. This unit puts out the heat to assure uniform heat for the entire cabin.

### Attack Indicator

The recognized need for an instrument capable of warning the pilot before stalling phenomena occur in flight appears to be producing several interesting products. Kollsman Instrument Division of the Square D corporation presented to the public recently an angle of attack indicator which is designed to report the direction of airflow. The instrument consists of a free vane exposed to the airstream, set to follow air movement in the up-and-down sense. The report from this vane is transmitted to a geared-up self-synchronous motor indicator, which indicates the angle of flow as compared to some arbitrary line on the airframe, such as the plane's longitudinal axis or its mean chord line.

The stall warning function of the instrument stems from the assumption that an airplane or aircraft of a certain configuration will always stall at a certain angle of attack. This is not a function of airspeed or of its flight path. It is therefore possible to sense the approach of a stall by measuring the angle of attack.

## THE BLACK BOX

(Continued from page 38)

ing is essentially the same as that for entering the localizer approach beam. From entry of the beam field to the end of the radio range, flight is completely automatic, including corrections for drift. Transfer from one range to another at points of intersection, is accomplished by tuning the radio to the new frequency. The human pilot, relieved of physical flight control, has ample time to watch instruments, secure weather reports, check fixes and the progress of flight, and perform the many other varied duties required of him. The accurate radio beam tracking, which FPC affords, precludes the possibility of off course mountain peaks suddenly looming ahead in the direct line of flight. Tracking of the direct route beam will also shorten elapsed time between points of departure and destination.

Full safety precautions of the FPC system, in addition to providing for instantaneous resumption of manual throttle control, include complete automatic disengagement should the beams or any other part of the system fail while in use. Though the system is sensitive to the main course of the beam, it will not recognize erratic or violent reflections that could throw the airplane out of control. This is a point which has particular significance near the end of an approach, when the airplane is flying at near stalling speed with very little altitude in which to recover from a violent maneuver.

The widely publicized GCA, or other similar systems can be used coincidentally with FPC, if desired, to give the human pilot a reassuring visual and/or aural indication that his plane is on the beam.

The FPC system, alone or combined, is certainly a very positive step in the solution to the problem of all weather flight—the problem of flight plan completion and the maintenance of schedule reliability, regardless of the weather.

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# Rendezvous

Gentlemen:

The February issue of AIR FORCE contained an item by Clara Jo Marsh Stember about the "Fifinellas" and their organization.

There are probably a large number of former Air Force personnel who would like to find some of their former WASP friends as I do, but Clara Jo was very cozy with information. She neglected to tell us the location of the headquarters of the "Fifinellas" or how we could get in touch with them.

I had a small part in the training of one WASP at Pecos Army Air Field in Texas and I have considered her the best woman pilot I had ever flown with, and better than many of my brother officers.

I would like to get in touch with this girl now and I think that arrangements of mutual advantage to her and this organization might be made.

Her name is Beverly Olson and unless I am greatly mistaken, she is one of the girls in the picture on Page 20 in that issue of AIR FORCE.

Roger V. Smith, Pres.  
Smith Frostrom Aircraft  
Austin, Texas

*Reader Smith is correct in identifying Miss Beverly Olson (see cut) of 807 S. 8th St., Richmond, Indiana. In answer to his query, Clara Jo Marsh Stember, national head of the Order of Fifinellas, advises us that there is now being compiled a "black book" giving the names, addresses and present occupations of all former WASPs. It will be available soon at \$1 a copy.*

*Inquiries should be addressed to Miss Holly Styers, 3633 Lavell Drive, Los Angeles 41, Calif.*

Gentlemen:

I am interested in contacting any of the 330th Fighter Sqdn. members who remember me. We had an A-Number-One outfit, even if we did have to fight the war in California. So any of you survivors of the Battle of San Diego who care to drop a line will be answered.

Thanks for the "At Home Abroad" story. I still remember the smells T/Sgt. Ota wrote about in and around Tokyo.

T/Sgt. Edw. J. Ganister  
1388th AAF BU, Sqdn. A  
APO 864, C/O P.M.  
New York, N. Y.

Gentlemen:

I have lost track of a few good friends of mine who were stationed with me at Hill Field, Ogden, Utah. The names of these men are as follows:

Capt. Benjamin Jaffe  
Capt. James L. Brock  
M/Sgt. Ernest L. Morrow  
S/Sgt. Samuel C. Kirkpatrick  
Sgt. Rueben H. Leichte  
Sgt. Durwood C. Wright.

If any of these men read this, I wish they would write to me here in Germany.

S/Sgt. A. J. Samuelvich  
ASN RA6148928  
501st Air Service Group  
APO 633, c/o Postmaster  
New York, N. Y.



Former WASPs, who have re-organized since the war as The Order Of Fifinella, are compiling a Fifinella "black book" soon available publicly for one buck.



# "ONE OF THE GREATEST BOOKS TO COME OUT OF THE WAR"

## THE Purple Testament

Edited by DON M. WOLFE  
Preface by JOHN DOS PASSOS

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**ROBERT E. SHERWOOD:** "Present and future generations of Americans owe a debt of gratitude to Don M. Wolfe."

**EDWARD R. MURROW:** "If there is a synthetic or false page in this book, I did not find it."

**THE NEW REPUBLIC:** "When you finish reading this book don't pass on your copy to a friend—make him buy it."

HERE is a book that deals *not* with vast air armadas, with grand strategy on the ground, with sweeping maneuvers at sea. Here, instead, is a flaming fragment, forged by men who fought in the war and fell. Here is a tapestry in words woven by men who were maimed in body and mind by the sharp, raw edge of battle.

THE PURPLE TESTAMENT is a book that you will understand and *feel* for it is a book to which you, yourself, might have contributed. And perhaps more significant than any of the stories it tells is the story of how the book came to be written:

Fifty-three disabled war veterans, eleven of whom had suffered single or double amputations, were attending a small university in Washington. They were learning to be veterans' counsellors so that they might help others more or less fortunate than themselves. Part of the prescribed course was an English class. The instructor was a man named Don Wolfe. To "draw them out" he encouraged his students to set down the things that were innermost in their minds. This book is the result.

Some forgot the war in their reminiscences, reached back to their childhood, remembered an

old willow full of blue jays that stood just outside the farmhouse door . . . the face of a father furrowed by some secret worry as he ploughed . . . the family jalopy and those Sunday drives down to Mexico . . . the look of grandma's cookies on a clean deal table . . . the taste of a hot dog at Coney Island . . . a touchdown run on a crisp fall afternoon . . . and then . . .

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The first day at camp and how the uniform didn't fit and your best girl came to visit . . . the sweat and fatigue of basic training . . . the strange things you thought about as you slopped through the surf toward that distant deadly beach . . . a sudden hot fire in your plane . . . your talk with Ernie Pyle in a fox hole . . . the defiant and shamefaced string of young men in uniform waiting their turn outside a Honolulu brothel . . . the sudden reassuring shock as your parachute opens . . .

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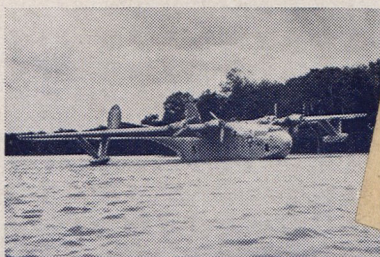
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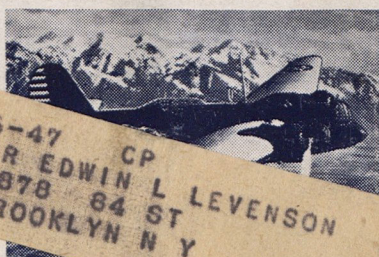
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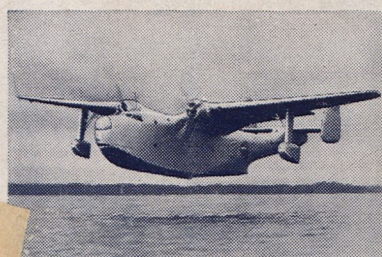
# Can You Name These Famous Planes?



Launched in 1941, this 72½ ton giant was the largest flying boat in the world. It was the prototype for a fleet of even larger flying boats which Martin designed and built for the Navy. It rendered wartime service in the Pacific area. It should be easy to name.



Flying 100 m.p.h. faster than ships, this Martin bomber obsoleted aircraft of its day. For designing and building this twin-engine bomber, Glenn L. Martin received aviation's highest award, the Collier Trophy, in 1932. If you don't know, see below.



Designed originally for patrol and submarine search, this twin-engine flying boat saw service in all theatres of operation and successfully accomplished all types of missions in World War II. It is an early version of a famous Martin family. Can you name it?



Do you know this oldtimer? Martin designed and built this plane in 1918. It was the first American twin-engine bomber. So sound was the design that it was used by the Army . . . Navy . . . for mail . . . passengers . . . and experiments in night flying. Give up? See below.



If you know this oldtimer, you know that Martin has been designing and delivering advanced type aircraft for a long time. This biplane was the first practical dive-bomber ever developed. It was designed by Martin for the Navy in 1930. Don't know? See below.



Carrying 36 to 40 passengers 100 m.p.h. faster than planes they supplant, this transport is already famous because sixteen airlines have ordered more than 350. The passenger and cargo versions of this great Martin transport are readily convertible to military needs.

## Here's Why Martin Aircraft are Famous

### *Developed by Martin Research . . . Proved by Our Military Services*

Martin research engineers have been working with our Military Services since 1913. The effectiveness of this combination is proved by the outstanding aircraft they have produced. The Marauder . . . the Mars . . . the Baltimore . . . the PBM family . . . that oldtimer, the B-10 . . . to mention a few. All . . . the most advanced aircraft of their day. All . . . designed and built by Martin to meet the requirements of our Military Services.

Today, too, outstanding military aircraft are being produced by Martin. The AM-1 Mauler—the Navy's newest dive-torpedo bomber . . . the PBM-5 Mariner—famous twin-engine flying boat . . . its sister ship, the Mariner Amphibian—largest amphibian in the world . . . and the JRM-2—an advanced version of

the giant Mars. Carrying the name Martin will be the Army Air Forces' XB-48—a high-speed, long-range bomber powered by six jet engines . . . and the Navy's XP4M-1—a land-based reconnaissance plane with top speed well over 350 m.p.h., with two jets for extra speed and two reciprocating engines for long range.

In addition, new fields are being explored . . . great new developments are on the way. Look to Martin for advances in electronics . . . guided missiles . . . new forms of propulsion . . . rocketry . . . materials and alloys . . . other products now undergoing tests in Martin research laboratories. Martin research points the way to the future. THE GLENN L. MARTIN COMPANY, BALTIMORE 3, MD.

#### HERE ARE THE FAMOUS PLANES PICTURED ABOVE:

- |                       |                |                           |
|-----------------------|----------------|---------------------------|
| 1. Martin XPB-2M Mars | 2. Martin B-10 | 3. Martin PBM-1 Mariner   |
| 4. Martin MB-2        | 5. Martin BM-1 | 6. Martin 2-0-2 Transport |

# Martin

## AIRCRAFT

Builders of Dependable



Aircraft Since 1909