

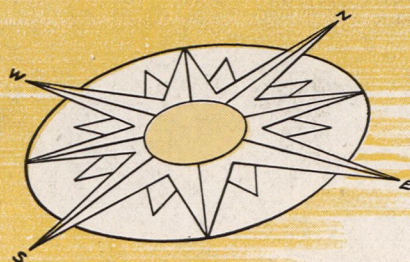
AIR FORCE

THE OFFICIAL JOURNAL OF THE AIR FORCE ASSOCIATION, JANUARY, 1947



Holiday Issue

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JANUARY, 1947

AIR FORCE

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How to Avoid Saving Money

by DANNY KAYE



To avoid saving money, the first thing is to cut off all your pockets. (Or throw away your purse and keep your lipstick in your snood.) Thus you will have to carry your money in your hand. Which will insure that you—1. spend it, 2. lose it, 3. get it taken from you—quicker!



Also to be avoided like crazy are piggy banks and sugar bowls. Keep these out of your home! The kiddies in particular are victimized by such devices, often saving quite a bale of moolah. Be stern even if the little ones cry—remember what money could do for them! And be sure to avoid budgets. It is best to draw your pay and walk down Main Street buying anything you don't particularly hate.

Above all, don't buy any U. S. Savings Bonds—or it's impossible not to save money! These gilt-edged documents pay fat interest—4 dollars for 3 after only 10 years! There is even an insidiously easy scheme called the Payroll Savings Plan by which you buy bonds automatically. Before you catch on, you have closets full of bonds. You may even find yourself embarrassed by a regular income! Get-gat-gittle!



IF YOU MUST
SAVE

Danny Kaye

SAVE THE EASY WAY...

BUY YOUR BONDS THROUGH PAYROLL SAVINGS

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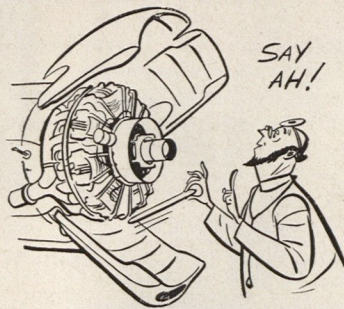
HANGAR FLYING



The Mechanical Mouth

It used to be like pulling teeth to get under an engine cowl. After a quarter-hour of yanking on rows of fasteners, you took down a truckload of Dural shingles. If you didn't lose or mash any under foot while you worked on the engine, you were lucky.

Now it's as simple as lifting the hood on the family bus. Lockheed engineers have worked out a new mechanical mouth for *Constellation* engines that opens up in two minutes flat. Unclasp and lift two small side panels, pull away the one-piece upper and lower hoods, and the engine's as bare as the tonsils of a six-year old saying "Ah!"



The giant metal jaws stay open obligingly, and completely out of the way. Prying engine medics get plenty of elbow room and save precious minutes on routine inspections. And the mechanical mouth shuts just as fast. Out at Lockheed, the story goes, they took turns saying "Jack Robinson" in timing it.

Everybody that sees the mechanical mouth says it's just common sense. And it's this kind of common sense that gets all the green lights at Lockheed and keeps refinements in step with aviation progress.

L to L for L

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Air Mail

Group Loyalty

Gentlemen:

Mr. Martin Caidin wrote a most interesting article about the P-51 Mustang. He mentioned the friendly rivalry between the 56th and 4th Fighter Groups. But is there one word about the 354th Fighter Group, the original "Pioneer Mustang Group?" The group that first flew and fought the long-range version of the P-51, the group that "proved" the Mustang. The only acknowledgment *AIR FORCE* makes that the 354th ever existed is a picture of Col. Jim Howard, one of the group C.O.s. What fighter group shot down more enemy aircraft than any other group in the AAF? It's in the official record. Look it up, Mr. Caidin. What group shot down more Jerries than all the other groups in the 9th A.F. combined? It's in the official records, Mr. Caidin. Of all the squadrons in the AAF in the ETO, which one was most feared by the Jerry Jaeger Fliegers? Check over the captured intelligence records of the Jerry fighter command, Mr. Caidin, and you will find that the squadron was the "Yellow-nosed Mustang," the 353rd Fighter Squadron of the 354th Fighter Group.

And, Mr. Caidin, what of the great group commanders of the 354th: Col. Martin, Col. Jim Howard, and finally the tiny colonel for whom every pilot in the group would have flown anywhere, any time—Col. George Bickell? And the aces, Mr. Caidin—Capt. Bruce Carr, Lt. Col. Glenn Eagleston, Lt. Col. J. T. Bradley, Major Don Beerbower (KIA), Major Wally Emmer (KIA), Major "Okie" O'Connor, Major Jim Dalglish, Lt. Col. Dick Turner, Lt. Overfield, and others.

In fairness to all men who at one time were members of the 354th, I feel that *AIR FORCE* should apologize for having omitted the 354th when it told the story of the Mustang.

An ex-Pioneer Mustang G.I.
Washington, D. C.

Corrected Information

Gentlemen:

In the September issue of your excellent journal in an article entitled "Giants," the author, William Friedman, quotes the following in reference to the British Tarrant triplane: "In England Walter Barling's 131-foot six-engined Tarrant triplane up-ended during her initial taxiing run. Mounting two 500-hp Napier 'Lion' engines on each wing, the Tarrant turned over because the pilot opened the two top on warming up."

The Tarrant triplane, or "Tabor" as it was named, was built in 1919. Designed by Mr. W. G. Tarrant, who was responsible for the Tarrant portable hut of the war period, the Tabor was one of the many "to bomb Berlin" projects envisaged at that time. The six Napier "Lion" motors were arranged as four tractor and two pusher units. The center plane had a span of 131 feet, and the upper and lower planes were each 98 feet, 5 inches span. The machine's height, its probable source of weakness, was 37 feet, 3 inches. The Tabor was one of the first aeroplanes to have a fuselage of monocoque construction, and during the early stages of consultation between Mr. Tarrant and technical officers of the Royal Aircraft Establishment at Farnborough, it was suggested that the Tabor would be tail-heavy. As a precautionary measure against this contingency, between 1000 and 1200 pounds of lead ballast was installed in the nose, before the fatal trial took place.

On the morning of May 26th, 1919, the Tabor started taxiing, and after making a number of uncontrolled turns, with the tail skid well off the ground, the pilot, Capt. F. G. Dunn, A.F.C., opened up the two upper motors. This, together with the influence of the ballast, pulled the Tabor over on to its nose, and caused the shocking deaths of Capt. Dunn and Capt. Rawlings, co-pilot.

Derek Moore-Heppleston
Yorkshire, England.

Single Command

Gentlemen:

This is to support Representative Randolph's article and Lieutenant General Doolittle's statement on the Unified Command in a recent *AIR FORCE*. Absolute and convincing proof will be found in the book I believe should be required reading for every American, "The Case Against the Admirals" by Richard Huie. I guarantee it will make any citizen boiling mad.

Representative Randolph suggests AAF vets tell friends, newspapers, and Congress, but the power of the Navy is organization. I feel, if Randolph or Doolittle or a well-known group could devise a plan whereby the whole AFA organization would petition or support at one time a full-scale campaign to lick this Navy Machine, it would influence thinking men of all branches and, in turn, their contacts.

Warren P. Cundell
Passaic, N. J.

AIR FORCE



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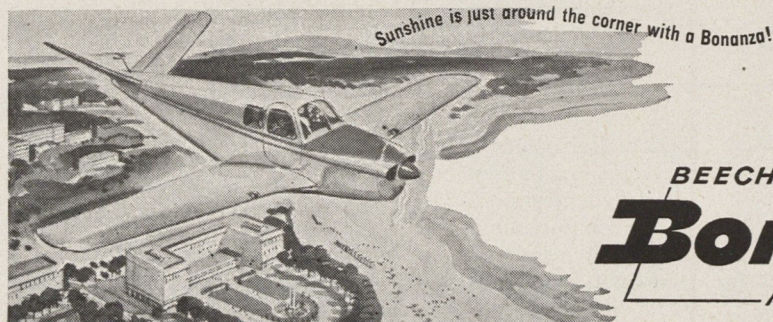
No ordinary airplane is capable of the utility required of a business vehicle. But the Bonanza is an *extraordinary*

airplane. It was *built* for business use, business utility, business economy. It has a speed and a payload with its economical 165 hp which have never before been accomplished short of 330 hp!

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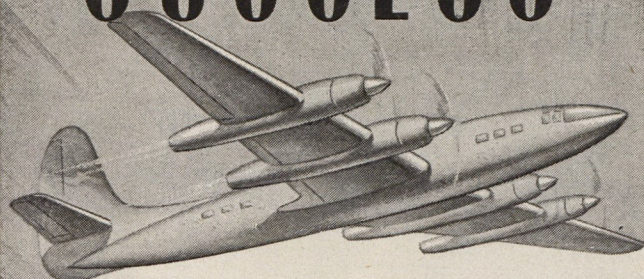
accurate and safe navigation; retractable tricycle landing gear, landing flaps and controllable prop for easy handling and added economy of operation.

The man-hours, money and travel fatigue which the Bonanza saves as a unit of your company transportation "system" repay many times its modest cost. The price complete is \$7,345 F.A.F. Wichita. Production for early 1947 is already sold. Orders for delivery will be filled in the sequence received. There is a nearby Beechcraft distributor with complete facts and figures ready to consult with you. Beech Aircraft Corporation, Wichita, Kansas.



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In This Issue

Unification

Merger of our armed forces is not a new plan. It was originally the subject of Congressional debate and hearings after the first war. But after five years of hearings and debates, the project died and was buried. Today, a year after General George Marshall reopened the subject with a plea to the Senate Military Affairs Committee for immediate action, we are little closer to unification than we were in 1919. When the 80th Congress convenes in January, the battle will be picked up where it was dropped by the 79th. There will be no new testimony or evidence either for or against. Unification proponents have pointed out the logic of the plan—have proved it, in fact—and can go no further. The opposition likewise has introduced all the testimony, logical and otherwise, it can possibly dig up. The only thing they can do now is stall and filibuster—an activity which may prove to be more effective in achieving its selfish ends than any testimony available. On page 11 Secretary of War Patterson restates with new clarity the crying need for immediate action.

Time Flies

The piece entitled "Flying Time" (P. 50), which deals with your aviation watch and its relation to your safety in flight, was written by Jay Kay Lazrus of the Academy of Time, who was a first lieutenant in AACS during the war. The Academy of Time is an organization through which scholarships and fellowships are granted for the study of horology and other timekeeping subjects. The Academy is a public service sponsored by the Benrus Watch Company. Among its trustees are General Carl Spaatz and Rear Admiral H. B. Sallada.

Airways Control

Edward R. Lewis, chairman of the famed British Decca Company, presents the theory of his Decca Navigator System in "The Color of Safety" (P. 57). Lewis and his associates got a little tired of waiting for the international government agencies to reach a decision on what kind of airways control system to apply in order to achieve increased safety for both air and marine vehicles. Decca took the bit in its teeth, proceeded to build a station in England and interest both airlines and marine operators in trying the service. Sites are currently being acquired in the New York area for the purpose of constructing a pioneer station in the U. S. as soon as the F.C.C. grants frequencies.

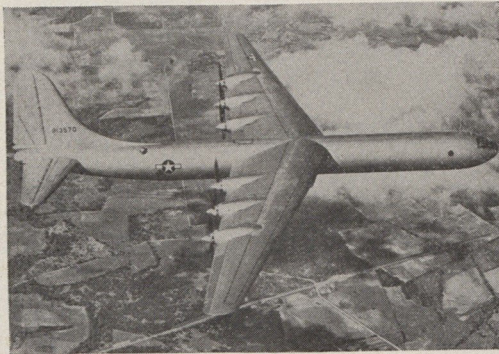
Crashing the Wall

By the time the readers receive this issue, "Slick" Goodlin may have made history by butting the needle-nosed Bell XS-1 through the transonic barrier (P. 34). What will actually happen is open to so many questions as this is written that scarcely any two experts have parallel opinions. Goodlin's job as Bell's test pilot is merely to assure the Army that the airplane will do certain basic things. But whether he will exceed these requirements is open to wide speculation.

Projects like the XS-1 and the proposed jet-powered bombers should be welcomed by all advocates of a sound defense program. It should be recalled that our tiny air arm emerged from World War I in the middle of some excellent developments. The period that succeeded the war saw aircraft pass the 200 mph mark, and the U. S. take the lead in both research and development. Then came the economy wave, and ten years after the last gun was fired the AAF didn't even have enough gasoline for training purposes.

Such projects as the XS-1 yield no one any immediate profit. But if the people, through their elected representatives, do not keep pressure on progress, deterioration will set in rapidly.

Bulletin Board



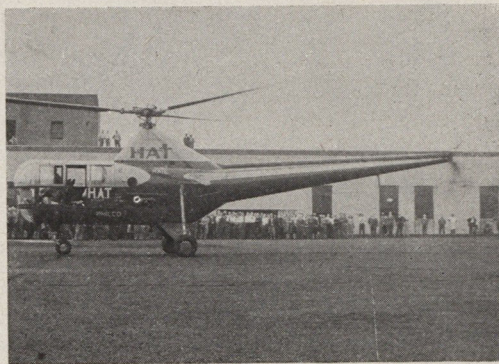
Flight view of Convair's 230-foot B-36 which can drop an atomic bomb on any inhabited place on earth and return to a base in the United States.



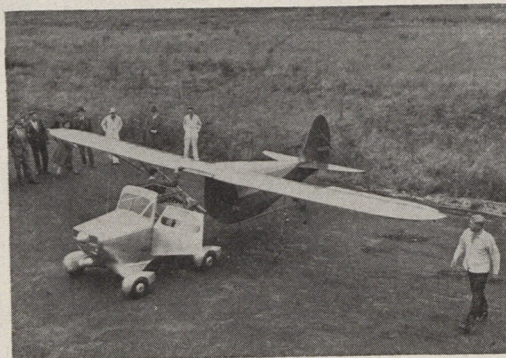
Giant helicopter featured Moscow's first postwar Aviation Day show. The Stalin prizewinner, it was designed by Prof. Yurjev assisted by I. Bratukin.



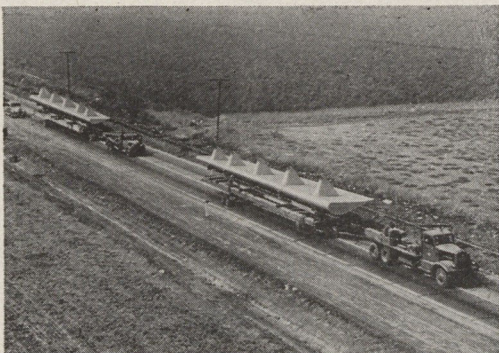
Mr. and Mrs. Frank Berry and their two children moved all their possessions from Portland, Me. to Oakland, Cal. in a DC-4 flown by John Honsinger.



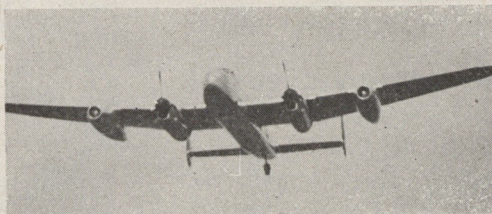
Over a hundred postmasters witnessed inauguration of helicopter airmail service from the roof of Philadelphia's post office to the local airport.



Robert Fulton, Jr., demonstrated his combination car and 125 mph lightplane at Danbury, Conn. Below, flaps for Hughes flying boat, with more span than a B-29, are trucked to the giant's assembly.

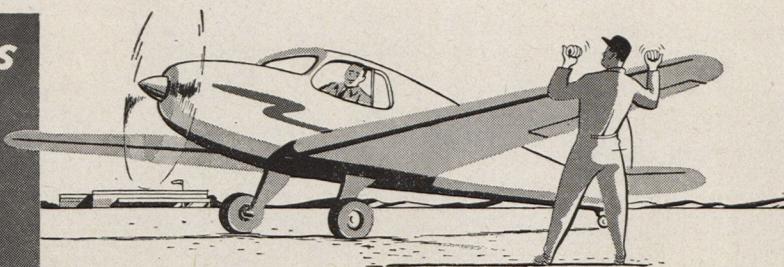


PICA0 delegates representing 25 nations, board the liner for Canada after a two months' tour of U.S. Below, semi-jet Lancastrian, in which Nene engines were substituted for the outboard Merlin unit.



STANDARD OF CALIFORNIA'S

PLANE FAX



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

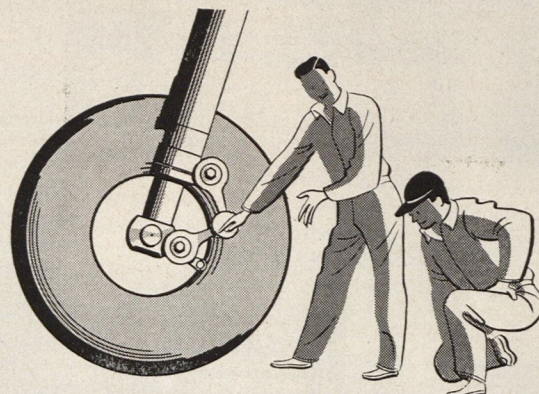
Sticking valves are often traced to lead deposits



Sticking and burnt valves in personal plane engines not designed for leaded fuels, are often traced to lead deposits caused by using gasoline which has been fortified with tetraethyl lead to boost octane rating. To eliminate this danger, Standard of California provides an unleaded 80-octane Chevron Aviation Gasoline. A high proportion of "alkylates" (blending agents used in fighter plane fuel) are used instead of tetraethyl lead to achieve Chevron Aviation Gasoline's high-octane rating.

Grease-streaked wheels warn of weak-kneed lube

When brakes of even a light airplane are applied, friction shoots temperatures to high levels. A grease not built for such heat, melts, runs out on brakes and wheels. To assure complete protection under top temperatures, be sure your plane's wheel bearings get RPM Aviation Grease No. 2. It's built to stand high temperatures, therefore it won't melt and run over brakes, neither will it congeal at low temperatures and lock wheels. RPM Aviation Grease No. 2 was especially designed in Standard of California laboratories to meet aircraft problems.



Flight school finds new oil doubles overhaul interval



John Schwaner of Sacramento Sky Ranch writes: "Last year we experienced considerable ring and valve sticking when using a popular un compounded oil in our 65 hp. training airplanes. We then ran careful flight comparison between the above oil and RPM Aviation Oil. We experienced valve and ring sticking between 300 and 400 hours in the engines operating on the un compounded oil, while the engines on RPM Aviation Oil ran more than 700 hours with excellent results."

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AIR FORCE



AIR FORCE

JANUARY, 1947

BY ROBERT P. PATTERSON

THE Army and Navy are back where they were before Pearl Harbor. They are leading separate lives and today we have two separate military establishments, each operating on its own. There is not even agreement between them as to the part in the national defense each should bear.

In August of last year the President asked the Joint Chiefs of Staff to study the over-all peacetime requirements of the armed services and to develop a comprehensive plan for his consideration. More than a year has passed and he is still waiting for a definition of the respective missions of the Army and Navy. The reason he is still waiting for his answer is that on the highest level there is no agreement on the respective functions of the War Department and the Navy Department. There is difference of opinion by sincere and earnest men. Perhaps the War Department is right; perhaps the Navy Department is right.

It has turned out as General Marshall predicted it would—as soon as the pressure of war eased up and each service would stand fast on its own concept of its responsibilities and there would be no one to break the deadlock. Thus the debate in the Joint Chiefs of Staff goes on and no plan has yet come forth.

The prime lesson of the war—not merely of Pearl Harbor but of every campaign, a lesson that should be “beaten into our heads,” as Admiral Halsey put it—is that there must be single direction of ground forces, sea forces and air forces, and Admiral Halsey was not referring merely to operations

Reprint from New York Times Magazine

DECISION or DISASTER

SECRETARY OF WAR PATTERSON ASKS UNITY NOW

DISASTER



Powerful 1918 German offensive hurried Allies into putting Gen. Foch in command of all troops. Move was not too early.



In the dark days of American Revolution, the Continental Congress gave Gen. Washington direct control over all forces.



The old Roman consuls shuttled command of their armies back and forth on alternate days until Hannibal demanded single rule.

overseas when he said that. He was referring to headquarters, right here in Washington.

This lesson of war has already been taken to heart by Russia, France and China. Those nations have dropped their old systems of separate departments and have put the three branches, ground, sea and air, into a single department. We Americans, who like to believe that we are foremost in profiting from experience, are still dragging our feet.

Prior to Pearl Harbor the War Department and the Navy Department had a few ties, but only a few. There was a joint board, made up of the Chief of Staff of the Army and the Chief of Naval Operations. There was a munitions board, made up of the two Under-Secretaries. There were several other boards. But to all intents and purposes each department led its own life. Each department had the task of defending the United States, but each went about the task in its own way. The weakness of that system was revealed to all our people by what happened at Pearl Harbor.

During the war there was an improvement. We had the Joint Chiefs of Staff—General Marshall, General Arnold, Admiral King and Admiral Leahy. Under pressure of extreme urgency the Joint Chiefs of Staff worked fairly well—despite the fact that action was taken only on unanimous decision, a rule that caused many delays.

Joint Chiefs Disagree

But the Joint Chiefs were unable to agree on a commander for the final assault on Japan, although the need for a single commander against Japan had become a pressing one. So there was divided command in what was one area of military operations. There we were on the verge of invading Japan and we had three independent commands intermingled on the island of Okinawa—General MacArthur's forces, Admiral Nimitz's forces and General Arnold's forces.

No one can give a sensible reason for that confusion of command. The confusion was due to the fact that there was divided command in Washington. This predicament—and it would have been a bad predicament if we had had to invade Japan—shows how divided command at headquarters is likely to give us divided command at the fighting front.

During the war we also had hundreds of Army-Navy committees. The best that can be said of the committees is that they were better than nothing. They did not prevent the evils of waste and competition in procurement of equipment. They did not save us from the ruinous waste of duplicating facilities—two airfields where one would serve, two hospitals

where one would fill the need, two depots where one would suffice, and many similar installations. The useless expense involved can only be guessed at; but I am certain that it ran into billions of dollars.

Another result of the two-department structure, fully as damaging, is the piecemeal treatment by one department—and by Congress, too—of problems common to both departments, problems that cannot be soundly solved except by unified action. I want to make it plain that in this discussion I am blaming no one; the blame is on the system. It is out of date and out of joint. I will mention a few instances.

Take the retirement of enlisted men. Retirement rights form a strong inducement to citizens to make a career of Army or Navy service. At present the service required before retirement is twenty years in both departments.

Navy Steals Beat

Last winter a bill was introduced and passed in the Senate dropping the service for retirement in the Navy to sixteen years. That meant that a Navy man at the age of 33 could retire at half pay. The bill had been passed by the House with amendments. The War Department was not consulted in the preparation of this bill. Yet elementary principles of fairness, and also equal opportunity to attract promising recruits, demand that equal treatment in the way of retirement be given to Army enlisted men.

Again, legislation has been adopted fixing the authorized strength of the Navy at 667,000 officers and men. This authorized strength was set without any discussion or consideration of what the Army strength should be or what part of the total armed strength of the nation the Navy should furnish. This action was typical piecemeal treatment of the national defense problem.

I say again, I am not criticizing any person or any organization in relating these incidents. I am sure that there are cases where the War Department has indulged in one-sided planning. The incidents are the natural product of a disjointed system, a system where each of two departments plans and operates on its own, without knowledge of what the other is doing.

We might consider for a moment Navy appropriations and Army appropriations. This is a shining example of piecemeal action, and it recurs every year. The House Appropriations Committee, subcommittee on Naval Appropriations, carefully studied the matter of Navy appropriations for the fiscal year beginning July 1, 1946, and ending June 30, 1947.

The study was carried on without the slightest reference to Army appropriations for the same period. The Army estimates were later submitted and they went to a different group, the subcommittee on Military Appropriations. How much in the way of duplications and useless expense is present, no one can say. No over-all plan of national defense is possible under such procedure.

Suppose Smith and Jones are partners in a business and Smith goes to a bank to borrow money for the business. The banker says, "I hear that your partner, Jones, has gone to the bank in the next block to get a loan. How much is he trying to get, and what purposes does he want to use the money for?" Smith says that Jones has gone to the other bank to get some money but that he does not know how much he is asking for or what the money is to be used for.

This may sound fantastic as a business transaction, but it is very close to what goes on every year with Army appropriations and Navy appropriations, each service going to a separate group in Congress for its funds, not knowing what the other service is asking for and not knowing what items are included in the other's budget.

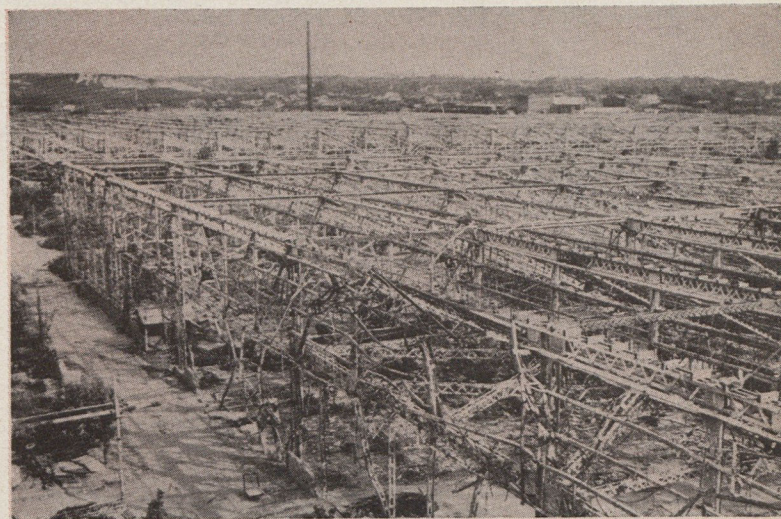
Unification In Congress Insufficient

This situation will not be corrected by the unification of committees in Congress, because different subcommittees on appropriations will still have to consider requests for funds by the Army and Navy separately. Still neither service will know what the other has requested. Unification of Congressional committees may help, but only unification of the armed services can meet the problem.

This condition—paralysis where action is needed, disjointed policy where comprehensive policy is called for, waste where economy is urgent—is nothing short of deplorable. No sound planning, no sensible policy-making, no consistent action is possible under the prevailing structure. I heard people defending it last year, but I doubt if any informed person would defend it today. A remedy is sorely needed. What remedy?

The issue of national defense must be seen for what it is—a single issue. That means, if we are to deal with a single issue in a sensible way, that we should have a single, united organization of national defense, headed by a single Secretary. Under the Secretary there should be three branches of equal standing—Army, Navy and Air. That is a simple structure, and it will work.

Why not a single department to deal with a single problem? We have the problem of foreign relations, and there is a



After viewing scenes like the wreckage of the Mitsubishi Aircraft plant at Nagoya, the U. S. Strategic Bombing Survey came home to recommend immediate adoption of a unified Department of Defense.

single executive department, the State Department, to administer foreign relations. No one claims that it would be better to have separate departments to handle different portions of the problem of foreign relations, with two secretaries giving the President different advice. We have the problem of finance, and there is a single executive department, the Treasury Department, to direct finance. No one has suggested that we ought to divide the Treasury Department into two or three pieces, to be administered separately.

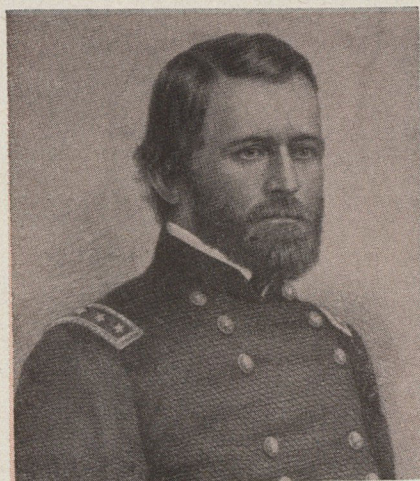
Benefits of Unification

A single department of national defense will give us discussion followed by decision, in place of endless debate. It will enable Congress to appropriate funds after seeing the whole picture. It will put an end to ceaseless jockeying for position. It will substitute economy for unnecessary duplication of installations and services. It will bring unity in place of purposeless rivalry.

It will be enlightening, I believe, to trace the recent growth of the conviction that we should have a single department of the armed forces.

In 1944 a special committee of the House on postwar mili-

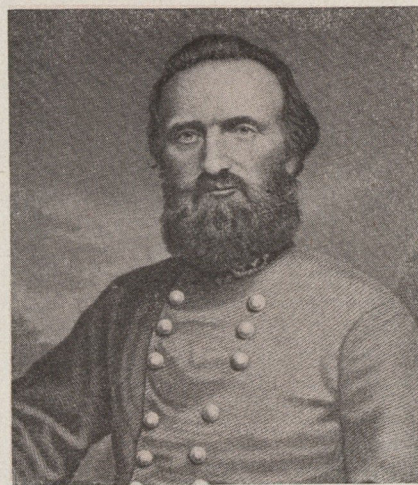
Gen. Ulysses Grant's reputation was made in defeating divided commands when he outdid two Confederate armies in Mississippi.



Gen. Robert E. Lee was successful in early stages of Civil War because the North had five separate armies in a single theater.



Stonewall Jackson defeated three Northern armies in 1862, mostly because each Union army fought independently of the other.



DISASTER

tary problems asked the War Department and Navy Department to present their views. The War Department witnesses supported the proposal for a single department without reservations. The Navy witnesses were noncommittal, suggesting only that the views of the commanders overseas be obtained.

The Joint Chiefs of Staff then appointed a special group, two generals and two admirals, to find out the views of the overseas commanders, as the Navy Department suggested. They found that a large majority of those in positions of authority overseas (practically all of the Army and one-half of the Navy) were convinced of the need of a single department. The Navy supporters included Admiral Nimitz and Admiral Halsey. The group—three to one—reported to the joint chiefs that the sound plan was to unite the military forces into one department.

Then the Senate Military Affairs Committee held hearings in the late months of 1945. For the first time the Navy Department came out in opposition, squarely in opposition. The War Department witnesses again supported the proposal.

Next the President sent a message to Congress urging that a single department of the armed forces be created. The Navy Department continued its opposition to the plan, however.

Dr. Vannevar Bush, who directed the Office of Scientific Research and Development throughout the war and contributed so much to winning the war—one of America's foremost scientists—came out for a unified establishment. He pointed out that scientific research and development for defense would be promoted to the best advantage under such a system.

Survey Recommends Unification

Recently the United States Strategic Bombing Survey, a group of twelve civilians appointed in 1944 by the President, made a report on the bombing of Japan. The survey recommended that a single, unified department of national defense be set up, with three branches, Army, Navy and Air.

As for the general public, the polls show a majority of 70 per cent believing in this plan.

The reactionaries who are opposed have to say something. So they say that a single department will give dangerous power to the military. That is supposed to make our flesh creep. But the fact is that the department will be under control of a civilian secretary, and the civilian secretary will be the subordinate of a civilian President. And Congress will always be in the driver's seat.

The plain fact is that civilian control will be as complete as it is under the existing system. The effective safeguard against any tendency toward militarism, under any organization of the armed forces, is in the lively vigilance of a democratic people. Freedom from militarism does not require us to keep an organizational anachronism that prevents the armed forces from doing their duty efficiently.

This charge of undue power to the military has been leveled at every proposal to strengthen our defense organization since it was first proposed to include in the Constitution the provision that Congress should have the power to raise and support armies. Consider this:

"The proposed plan is but an effort to adopt and foster, in a republican form of government such as ours, a system peculiarly adapted to monarchies having immense standing armies. * * * You are throwing the door wide open for a future autocrat or military despot. It is not, in my judgment, in accordance with the principle and theory of democratic government * * * to adopt such a scheme."

These words have a familiar ring. Yet they were spoken in 1902 by Gen. Nelson A. Miles in resisting legislation to create the post of Chief of Staff of the Army. The "future autocrat," "the military despot" has not put in his appearance in the ensuing forty-four years.

It is said also that no man can administer so "tremendous"



Joint Chiefs of Staff, General Marshall and Arnold (top) and Admirals King and Leahy (bottom), acted as substitute for unification in pressure of war. But the body could take action only when it was in 100 per cent agreement, sometimes a slow and tedious process.

an organization. This is another "flesh-creeping" argument. It is true that in war the organization is tremendous. It is not tremendous in time of peace. Yet the fact is that at all times the President, one man, administers a far more tremendous organization.

It is also the fact that authority would be extensively delegated to subordinates for actual administration. That is the case in both the War Department and the Navy Department today. They could not operate under any other principle. The authority and also the responsibility remain in one place, and that is the essence of sound organization.

The distinction to be grasped is between responsibility for administration and performance of the operating details involved in administration. The head of any department is held responsible, and properly so, for the efficiency with which the department is operated. But quite obviously he does not himself perform the administrative details. The Secretary of State is responsible for the actions of the Third Secretary in Paris, but he does not perform those duties himself. The post of Secretary of National Defense is not too great a responsibility for one man to carry.

Diversified Jobs No Impediment

The diversity in the activities of sea forces, ground forces and air forces is no impediment to unified direction. The proof of this is the Navy Department itself, which gave unified control to all three branches—sea, ground and air—in a wartime organization of nearly 4,000,000 men.

It has also been said that the proposal for a single department is based on a false premise, because it fails to differentiate between unified command in combat areas, which is conceded to be necessary, and the planning activities carried on at the seat of government. I submit that there is no difference between what is required of the armed forces in areas over-

seas and what is required in Washington. Both involve planning. Both involve prompt decision. Both involve operations to carry out the decision. The difference between the two is one of size, not of principle.

I have already pointed out that without unified direction at headquarters, we are likely not to get unified command in the field—witness the lack of unified command in the Pacific in the last war. But there is a more serious flaw in this talk about the value of having unified command in overseas areas and separate commands here at home.

Those who put up this argument make the old error that the next war is going to be exactly like the last one, with a world map divided up into various overseas theaters and everything peaceful here at home. The fact is, however, that the next war may be of a different character. Atomic bombs, long-range planes, long-range guided missiles—weapons of that character may bring the warfare right here in our own country.

Those weapons are no respecters of service prestige or traditions. The entire world could become one battleground. In that event the most violent reactionaries, who concede that there must be unity in the field, would have to admit, too late, that unity should have begun at the top.

It is a singular fact that nations that have been vanquished in war have often shown an ability to replenish their military strength quickly and to challenge the victorious powers again on favorable terms. The case of Germany between the two World Wars is an illustration. The reason is that the defeated start anew, with organizations and weapons that are up to date. Their adversaries, on the other hand, generally cling to outdated types of organization, weapons, and strategy. "We won the last war, didn't we?"

The charge is made that a single department will mean Army domination. There is no sense in such a statement. There is nothing in the proposed unity that would put the Army in the seat of power. What the proposal will do

is to split the present Army into two pieces—the ground forces and the air forces. The Army (meaning the ground forces) will be far smaller than it is under present organization.

Marines Secure

The Marines will be in jeopardy, it is claimed, if a single department is established. I yield to no one in admiration of the Marines and their fighting record. Their place in the armed forces of the United States is secure. It is absurd to suppose that in a single department the value of the Marine Corps will not be recognized. But if specific assurance is thought necessary, a specific provision for integrity of the Marine Corps may be placed in the legislation.

I have heard it said that we should not look for the logical solution, a single department of the armed forces. Why not go halfway? How about some more boards? How about a "coordinator" between the War Department and the Navy Department? He could decide disputes between the two departments; he could keep down competition; he could "coordinate" training, research, intelligence. He could act, it is said, as deputy to the President, and the two departments could preserve their precious independence.

I am certain that the "coordinator" plan would not work. It would give us the strange spectacle of two Cabinet officers subject to control of an official who would not be in the Cabinet. But the trouble would be worse than that, because it would put authority and responsibility in different places. No plan will work unless authority and responsibility are lodged in the same place. Under the "coordinator" plan authority over important activities of the War Department and Navy Department would be given to the "coordinator," but the responsibility of seeing to it that the departments carried on their activities efficiently would still remain the responsibility of the two Secretaries.

I am reminded of what William S. Knudsen said about co-

(Continued on page 64)

Distinction between army and navy equipment was erased in last war by introducing machines such as duck which was neither army nor navy but both. Organization advances must not lag behind technical.





New AFA Director

From editorship of *Barbed Wire News* at Stalag Luft VI in East Prussia to the advertising manager's position on a Chamber of Commerce magazine was the seven-league stride that brought Thomas C. McHale of Dallas, Texas, to the directorate of the Air Force Association. His recent election brings the national board to completion.

In a state where unusual war records are usual, McHale's combat background holds distinction. The one-time technical sergeant entered the Army Air Forces in 1942 and went overseas in 1943. After twenty missions as a B-17 gunner, he was shot down in the first Berlin raid on March 4, 1944. The Germans held him captive from this date until his liberation in April 1945.

It was at Stalag Luft VI that the Nazis gave him permission to publish *Barbed Wire News*. He was allowed to print only one copy for the three thousand prisoners in the camp, and BWN undoubtedly has the distinction of having had the greatest circulation per copy of any paper ever published.

McHale succeeded in smuggling a few copies of the paper out of the camp, and they are surely destined to become almost as much a collector's item as the famous wallpaper editions of the siege of Vicksburg era in the War Between the States.

Prior to the war, McHale was active in public relations and advertising circles in Texas.

With the Wings

Colorado, Iowa, Connecticut, Vermont, Rhode Island, Louisiana, Illinois and Oklahoma have been in the Wing organization forefront. Meeting at the call of C. C. West, the Colorado Wing organized with Stanford W. Gregory a commander, Mr. West as vice commander, Max H. Houtchens as secretary, and John B. Welborn as treasurer. In Iowa, the state meeting led to election of Ellis E. Eno as commander, Claude E. Geissler as vice commander, Charles A. Goeken as secretary, and William R. Haines as treasurer. Vermont's Wing program is under the direction of John F. O'Connell, chief of special services, Veterans Hospital, White River Junction. John C. A. Watkins of Providence took the lead in the activation of the Rhode Island Wing. T. B. Herndon of Baton Rouge has associated with himself a large number of former AAF members in getting the Louisiana Wing off to a sound start. Robert F. Raymond was aided by George R. Stanley in activating the Connecticut Wing, with Carl D. Jenson selected as Deputy Wing Commander. Ray W. Ireland of Chicago was making progress with the activity in Illinois, and in Oklahoma B. S. Graham of the Lazy 8 Ranch, Sulphur, gave a hand with the preliminary organization program.

Squadrons Increase

Flint and Grand Rapids in Michigan; Buffalo, Albany, Rochester and Syracuse in New York; Yuma, Arizona; and Cincinnati, Ohio have joined the new Squadron ranks of the Association. Intensive activity is under way in the New England states. From West Falmouth, Massachusetts, Robert S. Browning as Group Commander is pushing for units at Falmouth, Hyannis, Orleans and Martha's Vineyard. In Connecticut, Deputy Wing Commander Carl Jenson has sparked a Squadron program with a meeting at Hartford. Busy indeed is Commander Clarence C. Case of the Grand Rapids, Michi-

gan, Squadron. He's director of the Council of Veterans' Affairs for Kent County, operating a center that advises with thousands of veterans.

Briefing Room at Show

The thousands of visitors to the National Air Show in Cleveland, Ohio, were "briefed" by the Air Force Association. Arman L. Merriam, Group Commander, Ohio Wing, Air Force Association, and his associates installed and manned the "Briefing Room" which became one of the highlights of the exposition. One day was set aside as AFA Day. President Doolittle, Executive Director Willis S. Fitch and Harry Hammer of the headquarters staff joined with Ohio Wing leaders in the day's observance.



England's Under Secretary of State for Air, the Honorable Geoffrey de Freitas, accepts a king size greeting from Air Force Association.

WAC Squadron No. 1

Baltimore's Air Wac Squadron No. 1 has been activated with Miss L. M. "Bunny" Gardner as Commander. Maryland Wing Commander Marshall Boone gave the AAF Girls an assist at the initial meeting. Others officers of this new Squadron are Miss Muriel J. Miller, vice commander; Mrs. Mildred Amhrein, secretary; Miss Hazel M. McKinnay, treasurer; and Mrs. Hilda E. McCann and Misses Emma Shaw, Shirlee Fox, Ada Fern Cole, Dorothy E. Shaefer, Rosalie Spisler and Mary Jane Satterwhite, council members.

Other Air Wac Squadrons are forming and in many areas the former WACs are aligning with men comrades-in-arms in Squadrons. Whether the WACs form their own Squadrons or associate with the "mixed" units is a matter for local determination, and either way they are not "auxiliaries."

Dreamboat Crew Feted

The crew of the "Pacusan Dreamboat" wound up their hectic personal appearance tour at an AFA dinner following ceremonies at the National Aircraft Show in Cleveland. Jack Warner, AFA West Coast enthusiast, also played host to the Arctic trailblazers at Warner Brothers Studios in one of the crew's more interesting interludes. Incidentally, a first hand account of the "Dreamboat's" odyssey will appear in an early issue of *AIR FORCE*.



Air Force Association

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

Dear Former Member of the AAF:

The war against Germany and Japan is over, but the kind of peace we fought for has not been won. Every day's headlines tell of trouble, tension and unrest throughout the world. We who were a part of that great team, the Army Air Forces, are well aware that this is no time to relax our vigilance.

And yet, today we are as vulnerable to surprise attack as we were in the years preceding Pearl Harbor. General Spaatz has said "we are an Air Force in memory only." General Stratemeyer, who is charged with responsibility for our national air defense, has stated that "the present AAF couldn't punch itself out of a paper bag." Relegated to a secondary rôle, the AAF this year received less than \$1¼ billion out of the \$12 billion appropriated by the Congress for national defense. As a consequence, air research and the air reserve training program have been seriously hampered.

I'm sure that you will want to help remedy this situation, and you can help by joining the Air Force Association today. In addition to the personal satisfaction of participating in the program to achieve for the Air Forces equal status with the ground and sea forces, you will receive:

1. A year's subscription to *Air Force*, the magazine you read during the war, now the official journal of the Air Force Association.
2. An embossed membership card that identifies you as an Air veteran and entitles you to visit on occasions specified by the base commander any AAF installation in the continental U. S.
3. A distinctive lapel insignia that marks you as a former member of the Army Air Forces and as a member of the Air Force Association.
4. The opportunity to continue service friendships, perpetuate AAF traditions, and commemorate those who did not return through the formation of state Wings and local Squadrons. (If you would like to help organize a Squadron in your own community, just drop us a line and we'll send you full details.)

We'll be proud to have you with us in the one big organization restricted to present and former members of the AAF. Annual dues are just \$3.00, so won't you please fill in and return the form today—or, if you are already a member, pass it along to a friend. *Let's keep the gang together.*

As ever,

J. H. DOOLITTLE.

MEMBERSHIP APPLICATION

I represent that I have been honorably separated from, or am now on active duty with, the U. S. Army Air Forces and hereby apply for membership in the AIR FORCE ASSOCIATION. Please send me membership card and lapel emblem. I enclose \$3.00 (\$2.00 of which is to cover a year's subscription to *AIR FORCE Magazine*).

Name..... Rank..... State.....
Please Print

Present Address..... City..... Zone.....
Street

AAF Unit..... ASN.....

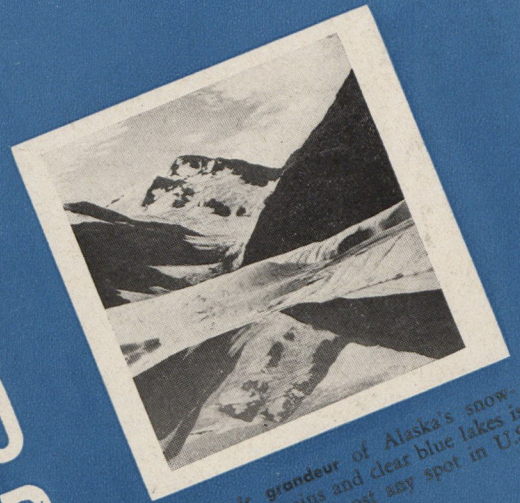
Please Mail to

AIR FORCE ASSOCIATION
1603 K Street, N.W.
Washington 6, D. C.

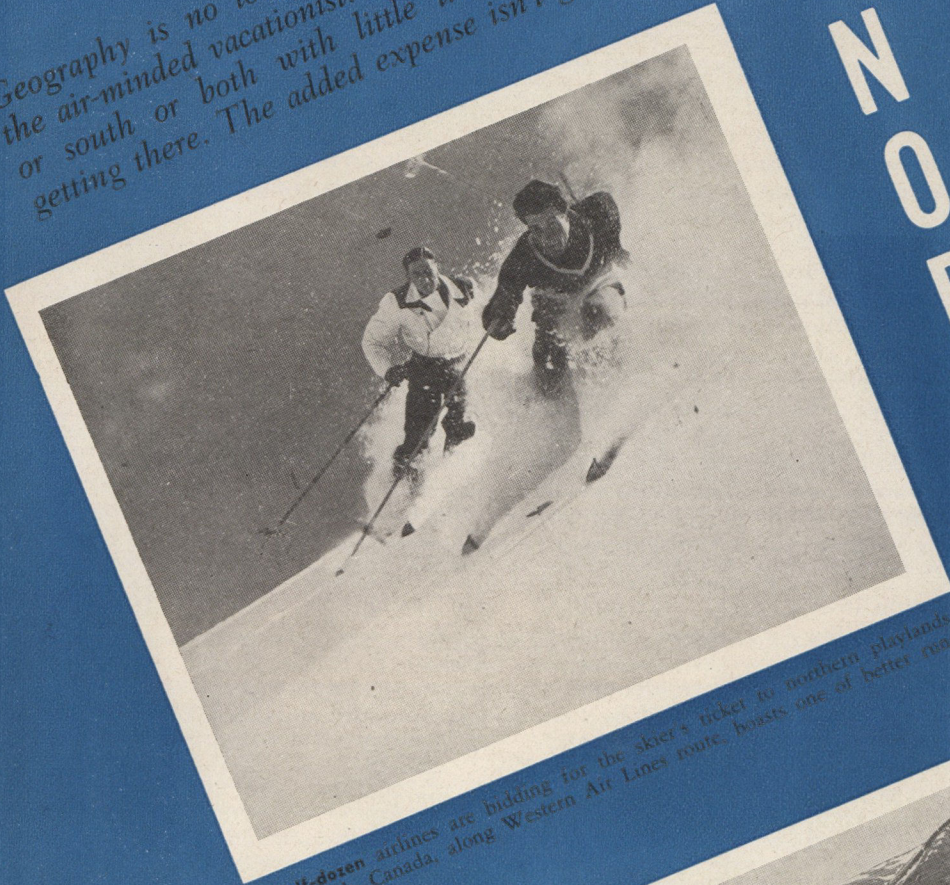
JANUARY, 1947

Geography is no longer a consideration to the air-minded vacationist. He can go north or south or both with little time lost in getting there. The added expense isn't great

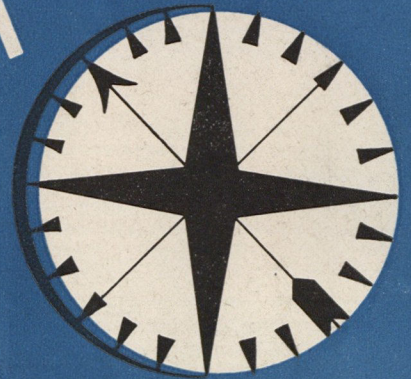
G O N O R T H



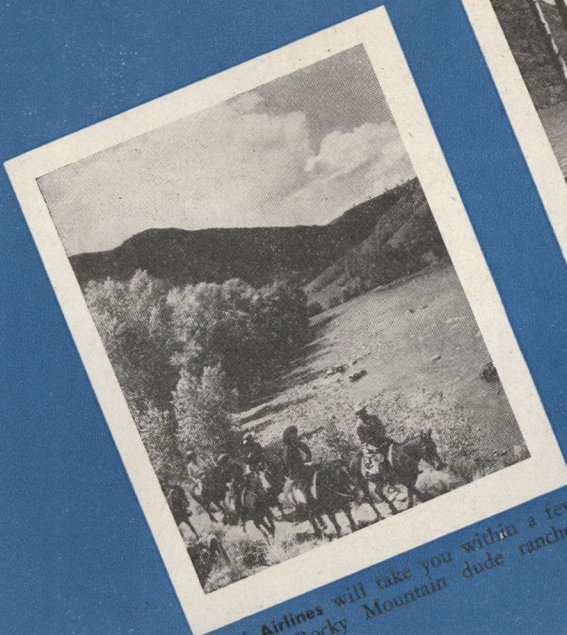
The scenic grandeur of Alaska's snow-capped mountains and clear blue lakes is accessible from almost any spot in U.S.



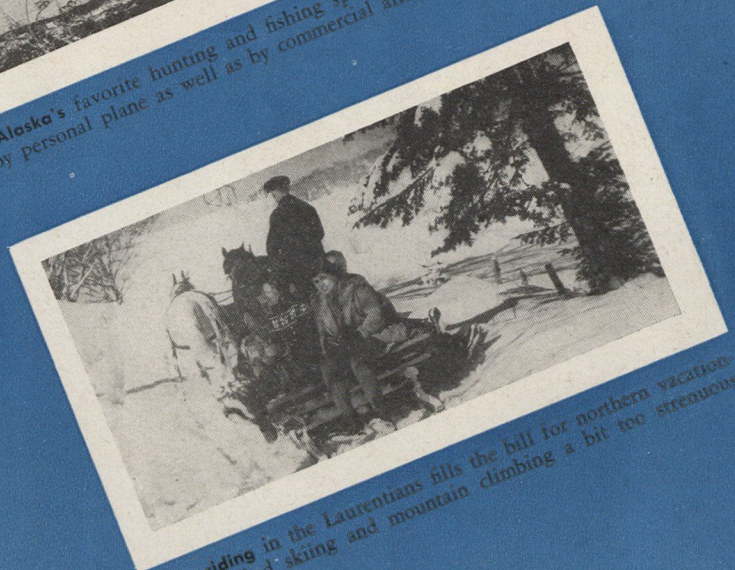
A half-dozen airlines are bidding for the skier's ticket to northern playlands. Banff Park, Canada, along Western Air Lines route, boasts one of better runs



Many of Alaska's favorite hunting and fishing spots can be reached by personal plane as well as by commercial airlines



United Airlines will take you within a few miles of Rocky Mountain dude ranches.



Sleigh riding in the Laurentians fills the bill for northern vacationists who find skiing and mountain climbing a bit too strenuous.

A LONG about Christmas time, a lot of ex-GIs who have been working as civilians for about a year now will become eligible for their first postwar "two weeks with pay." For the first time in five or six years they can enjoy a vacation instead of a furlough. They won't have to carry passes in their pockets to prove they're off the post legitimately, and they won't have to worry about their hats being two inches above the right eye. They can take it as they like it.

But in addition to the luxury of being a free moral agent, there are other more germane considerations which promise to make the 1946 holidays much more enjoyable than they were in winters gone by.

It used to be that a holiday excursionist had one of two choices. He could stay within the perimeter of his own county and be able to spend most of his time where he was going, or he could travel farther abroad and devote most of his time getting there and returning. But now direct airline service to the country's leading playgrounds is changing all that. A cattle rancher in the Texas Panhandle can knock off for two or three days and spend all but a few hours of his time skiing in Alberta, Canada if he chooses. Or an Ohio miner can travel to Florida's sunny beaches in almost less time than you can spell anthracite. One company—Resort Airlines—even advertises a 16-day "package" vacation which covers 22 states from New York to California, a round trip of 7,000 miles, with actual travel time of only forty hours.

The business of scheduling air routes for the special benefit of vacationists is a relatively new enterprise. To be sure, Pan American has been dabbling in this field since 1927, when the company introduced regular service between Key West, Florida and Havana. But for the most part the service is a postwar baby—and it's proving to be a darn healthy one.

Some of the special inducements which are being offered to excursionists by many of the lines include reduced rates and extra baggage allowances. For example, Colonial Airlines excursion fare from New York or Washington to Ottawa



Resort Airlines operates exclusively in the aerial vacation field, features 16-day all-expense trips from N. Y. to Calif.



New Orleans' Sugar Bowl classic is one of the main attractions for those planning a southern holiday.



Miami contends that its beaches offer a more stirring challenge to the he-man vacationist than the best ski slopes in the country. And they've got pix to prove it.

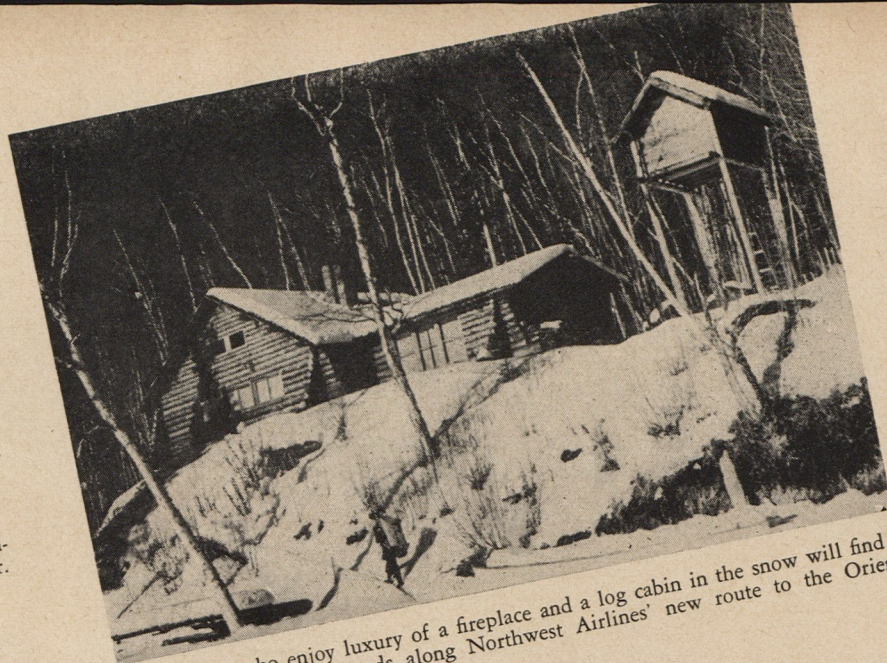


This you'll find in Mexico City, American Airlines says.

GO SOUTH



Airlines have brought game birds of the north within shooting range of the most distant hunter.



Vacationists who enjoy luxury of a fireplace and a log cabin in the snow will find it in the Alaskan playgrounds along Northwest Airlines' new route to the Orient.

GO NORTH

is as much as 37.5 per cent under regular rates. Extra baggage allowance usually authorized the vacationist is ten pounds, to be used for such needs as skis, ski equipment.

Nearly two million Americans will travel north this year to participate in winter snow sports. Most popular of these, of course, will be skiing. But for those who like their relaxation a little more relaxed, there will also be skating, tobogganing, hunting, snowshoeing, winter photography, and just plain loafing.

Most dependable of the northeast's ski runs is Vermont's Green Mountains, where in the higher elevations there is an average of 110 inches of snowfall yearly. The variety of terrain and altitude, the open slopes, cross-country trails, and down-mountain runs make it possible for skiers of all skills to enjoy the sport somewhere in Vermont all season long. Among the favored spots are Pico Peak, Stowe, Big Bromley, and Snow Valley—all only a few minutes by auto from Rutland, which is serviced regularly by Colonial Airlines.

In Canada, Montreal offers good skiing on Mount Royal within the city limits, while the Laurentian Mountain chain, extending northward for 90 miles, is a skier's paradise. The entire area is dotted with French-Canadian villages, each with well-developed trails and open slopes.

The Gatineau Hills, skirting Ottawa, provide excellent cross-country, trail, and open-slope skiing near enough to allow skiers to make use of the hotel facilities and see the many points of interest in Canada's capital.

New York State, too, has its winter playgrounds. Lake Placid attracts thousands each year with its Olympic hockey arena and ski jumps. Hundreds of miles of trails crisscross Mt. Whitney, Mt. Marcy, and Whiteface Mountain.

Saranac Lake is the birthplace of the Eastern Amateur Ski Association. Mt. Dewey and Mt. Baker provide a variety of trail skiing while the Mt. Pisgah ski tow, near the outskirts of town, serves a 35-acre open slope area. Saranac and Lake Placid are 105 minutes from La Guardia Field.

Northwest Airlines, which services many of the northern states as well as Canada, Alaska, and the Orient, is making a special bid for the hunter's vacation travel ticket. In anticipation of their annual trek north, Northwest recently published a hunters' "where to go" guide covering nine northern states, Manitoba and Alberta, Canada, and Alaska—all of which are on the Northwest air trail. The hunters' haunts in North and South Dakota and northern Nebraska are also serviced by Mid-Continent Airlines.

(Continued on page 63)

GO SOUTH

Acapulco, Mexico, along American Airlines' southern route, is becoming popular with vacationists who like sunshine, a gentle surf, nothing to worry about until mañana.



Mardi Gras, like corn pone and candied yams, is a bonus the Dixie-bound vacationist will be offered.





PROP-erly speaking

BY WILLIAM S. FRIEDMAN, *Sgt., A.C. Res.*

THERE are people in the aviation business who are so enamored of the sound of P-84s going 600 and plenty miles an hour that they are ready to sell propellers down the river and put pure reactive engines into everything that flies, from Cubs to Connies. While there is little doubt that the piston engine has passed its zenith, there is likewise no reason for burying the Archimedean airscrew along with the lateen sail and the horse collar—that is, not just yet. A careful examination of the future of airborne power plants will reveal certain limitations for the pure jet. This limitation does not affect the argument between reciprocating and turbine power sources.

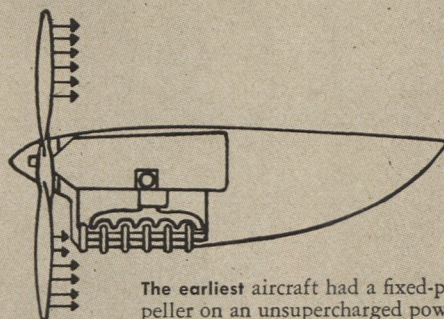
In tracing the changes between primitive flight power and the latest prop-jet combination, five engine types are up for consideration. The simplest and probably the least efficient is the fixed propeller driven by a piston engine. In this setup the air comes into the induction system haphazardly through a simple intake manifold system. All the motive power is fed to the fixed-pitch propeller and the exhaust gases are ducted out of the exhaust stacks in the most convenient manner possible, with no thought given to putting it to any use.

The second choice is the same piston engine, equipped with a variable pitch propeller. A mechanical supercharger is appended by means of a gear train to the rear of the crankshaft. Thus the amount of air inducted into the engine can be boosted. The volume of gas handled by the engine is increased to the extent that a considerable portion of the total available thrust is blown out of the exhaust under considerable pressure. By facing the exhaust rearward, considerable augmented thrust can be recovered from the waste gas.

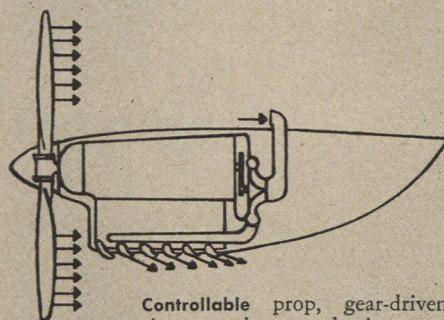
The third system shoots the waste gas through an impeller wheel which, in turn, drives a compressor. The compressor drives air under pressure into the carburetion system. Through a careful system of engine cowling, much of the heat expended by the engine is picked up. The air which is drawn in to cool the engine expands and is jetted out the rear through a specially shaped jet orifice, where it is joined by the burned gases shooting out of the supercharger's waste gate. Typical of this system is the fan-cooled power plant of the Republic Rainbow.

The fourth step is the straight jet or gas turbine. In operating principle, it is the turbo-supercharger sans engine. The combustive gas, usually a fine spray of filtered kerosene, is burned in a special series of chambers located on the outer surface of the system. These jet their gases onto the impeller wheel, which is rotated at high speed. Attached to the impeller by means of a shaft is the compressor, much

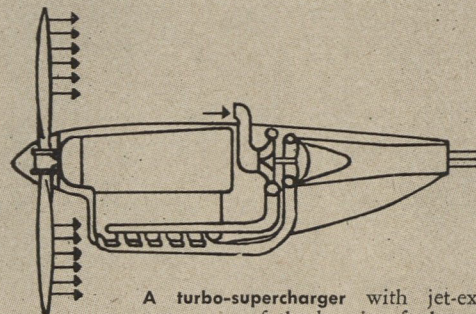
Is straight reactive power ready to replace the conventional propeller on all types of aircraft?



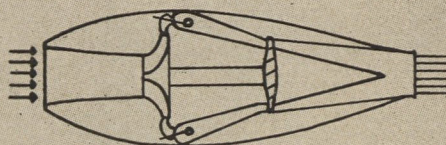
The earliest aircraft had a fixed-pitch propeller on an unsupercharged power plant.



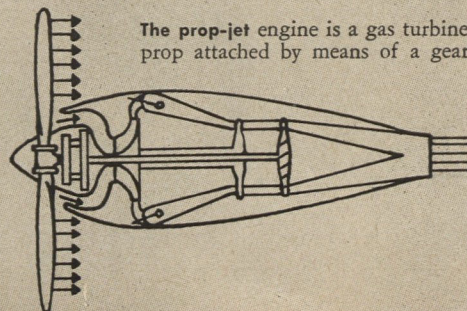
Controllable prop, gear-driven supercharger and rearward exhausts came next.



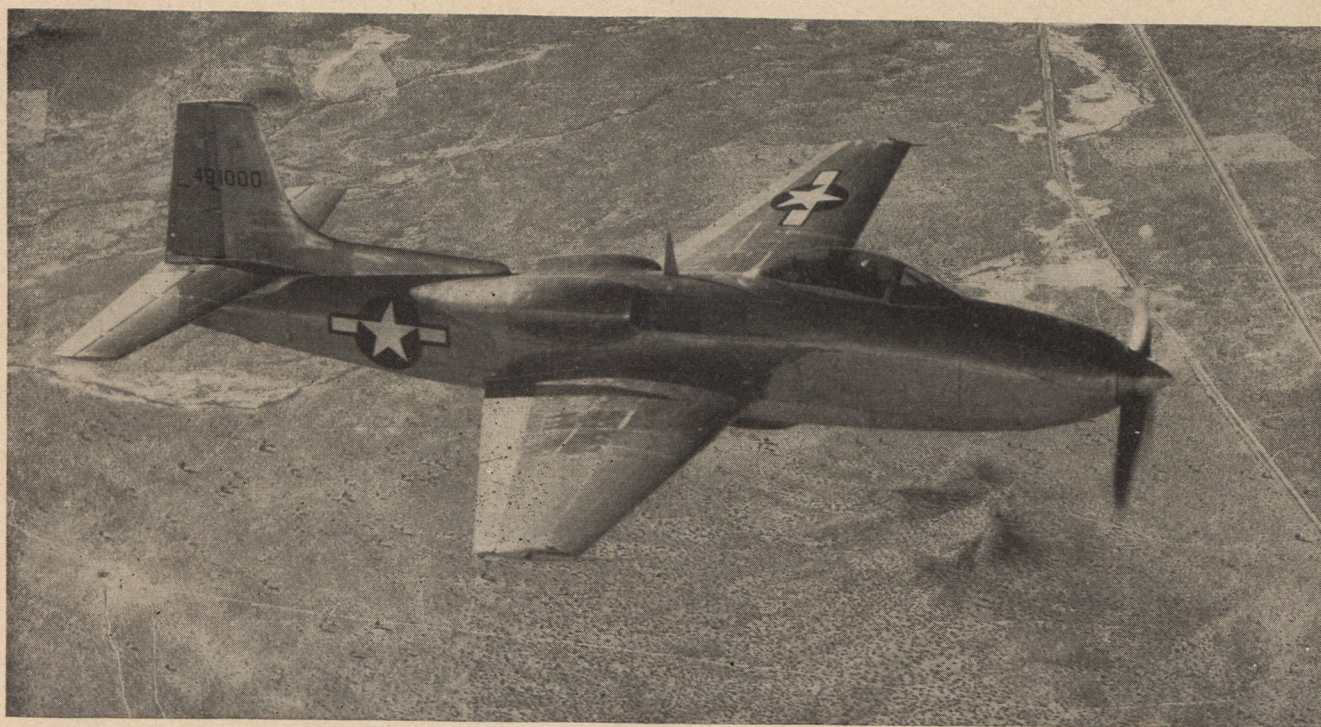
A turbo-supercharger with jet-exhaust puts more of the burning fuel to work.



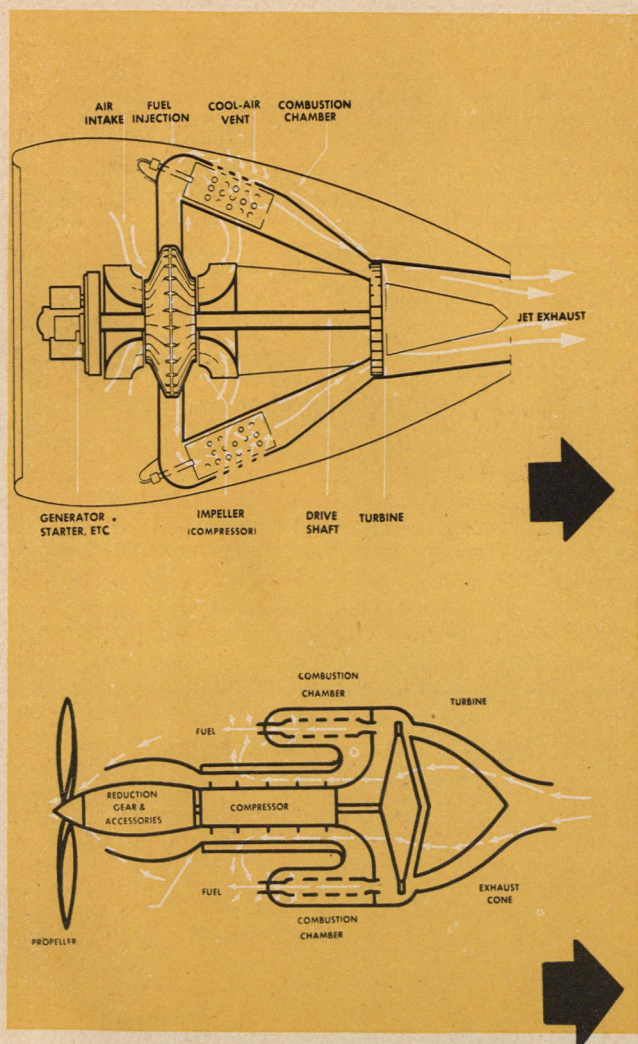
The simple gas turbine mechanically resembles above unit's turbo-supercharger.



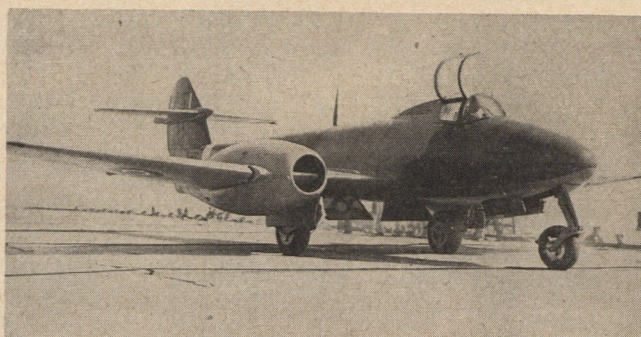
The prop-jet engine is a gas turbine, with prop attached by means of a gear-train.



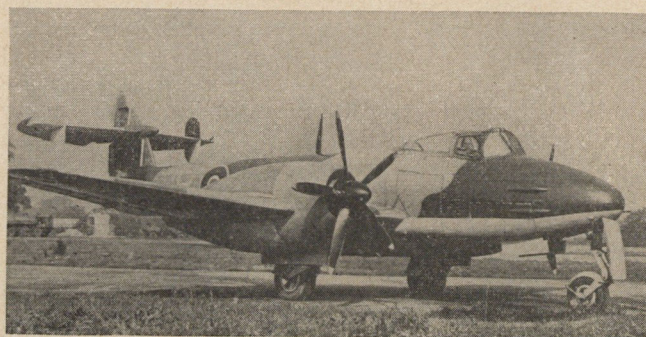
The first pure prop-jet was Consolidated-Vultee's XP-81. Designed for long-range operation, it is powered by a gas turbine driving a propeller in the front unit, and a pure jet behind. The total power output of this giant is greater than a B-29's. Its operational speed exceeds 500 mph.



The famed Gloster Meteor, shown here after landing on the deck of an aircraft carrier, is powered by centrifugal compressor type jet engines whose operating principle is indicated to the left. In this type, all of the energy available goes into straight reactive thrust, which is highly effective at high altitudes, but makes for poor take-off performance and initial climb characteristics with any load.



The Meteor airframe, powered by two Trent type gas turbines, geared to five-bladed propellers. The diagram shows an axial-compressor type of gas turbine, to which the propeller has been appended by a gear system. In this setup, the propeller absorbs most of the kinetic energy, but a considerable amount of thrust is still available for jet reaction. This setup has lower top speed but better take-off.



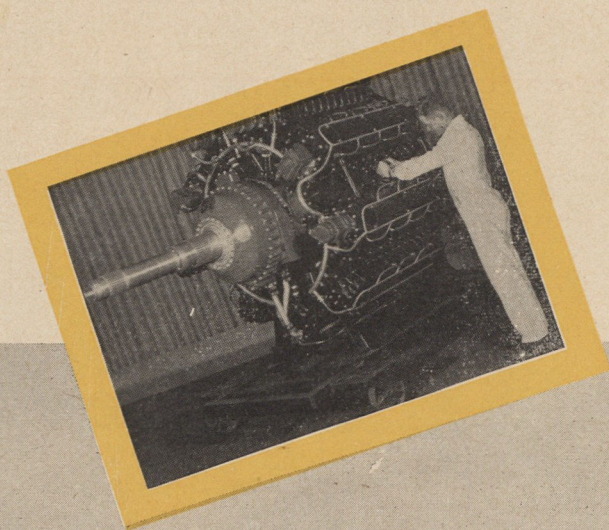
like the centrifugal compressor in a turbo-supercharger. This stage induces great volumes of air and injects it into the burning chambers where it is mixed with fuel and burned. The gases are then jetted out of the combustion chamber, whence they pass through the impeller wheel and out of the exhaust jet.

The prop-turbine combination is similar in operation to the pure jet, except that a propeller is attached to the front end of the compressor stage by means of a gear system. In this case, the bulk of the thrust is produced by the propeller, but the jet-effect is no small portion of the total available power. The prop-jet combination is a lot like the turbo-supercharged piston engine setup in which the supercharger has been enlarged and conventional power plant eliminated.

Farewell to Pistons

The Army recently relaxed security on the 5,000-hp 36-

World's largest aircraft engine,
36-cylinder 5000-hp Lycoming X-7.



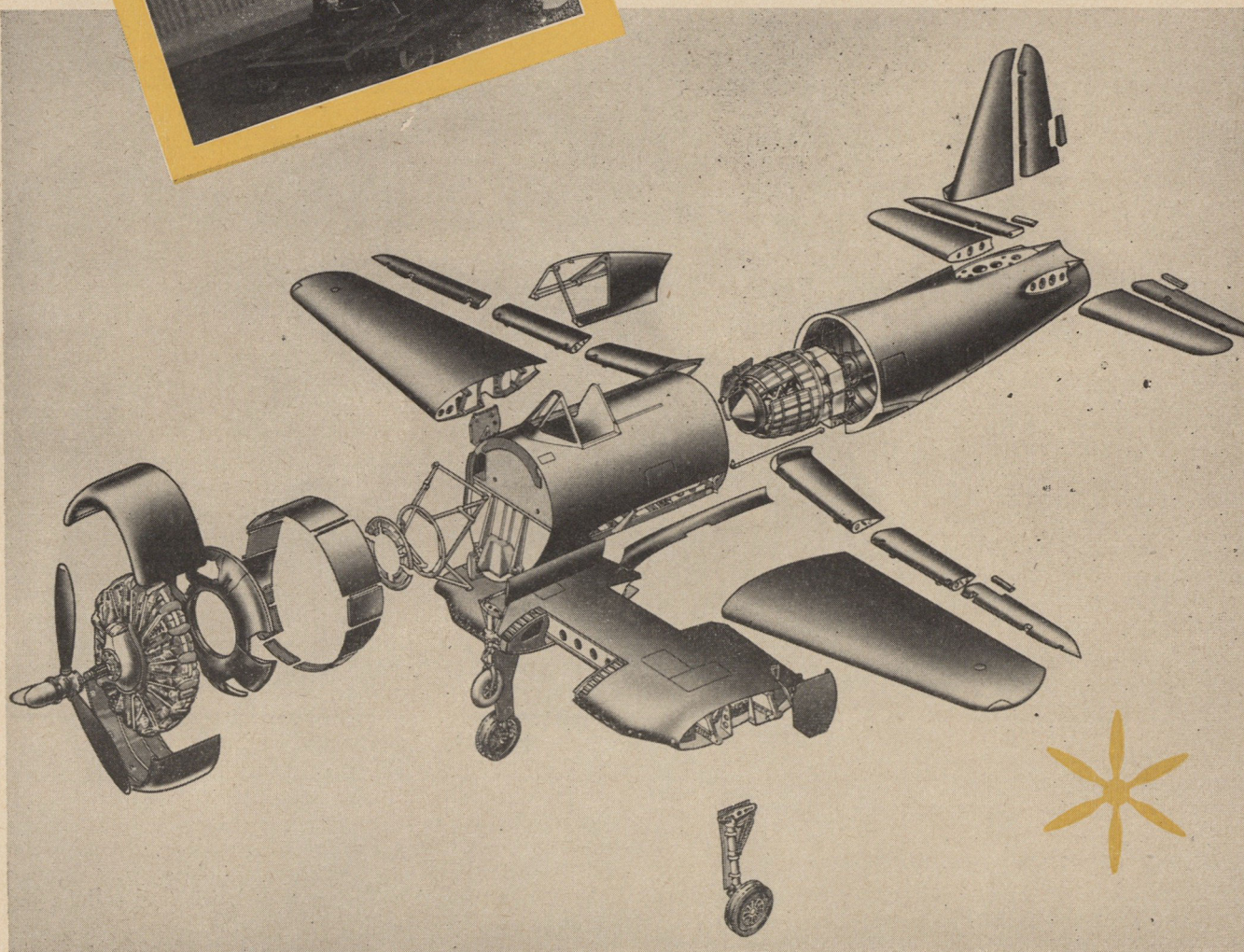
cylinder liquid-cooled Lycoming X-7 engine. A monumental engineering job, it is regarded by many engineers as the ultimate in complexity in aircraft power plants. Singularly efficient, it weighs only a little over three tons, compared with 1,950 lbs. for the parallel-powered DeHavilland Ghost turbine. However, the giant, whose output is equal to a locomotive, is over ten feet in length, better than five and a half feet high, and needs two starters, two vacuum pumps, and two tachometers. This engineering marvel in bulk and output tends to prove that the day of the reciprocating power plant in aircraft is drawing to a close.

The piston engine, having nearly three times as many essential parts, compels the line of force to make a number of high-angle bends before it is delivered to the propeller. There is a change of direction when the energy is delivered from the piston to the connecting rod and from the connecting rod to the crankshaft. Compare this with the virtual straight line that the line of force makes in a gas turbine.

Because there are no reciprocating parts in a gas turbine, there is an operational smoothness that no piston engine can boast. Furthermore, the reduction in number of rubbing parts and portions exposed to burning gases is reduced to a minimum, although the gas turbine is not without its own lubricating problems.

In the jet-turbine unit, as used in most of the high-speed fighters of the Gloster Meteor-Republic Thunderjet class, the turbine itself is a subsidiary component, whose sole function is to drive the largest possible compressor which will

Exploded view of the Ryan Fireball, showing the combined installation of the Wright Cyclone and the General Electric engines.



deliver great volumes of air at high velocity. If the mechanical power is required, as in the front stage of the Convair P-81, the role of the components is reversed. The compressor becomes an auxiliary, supplying a sufficient quantity of air for combustion with fuel to drive the largest possible turbine. It should be remembered that the power output of the jet engine is considerably less than the amount developed internally. Up to 75 per cent of the total generated power goes to driving the air compressor system. For instance, in the rudimentary jet like DeHavilland's Goblin, nearly 6,000 hp is required to deliver 60 lbs. of air per second.

Prop or Propless

The method for determining whether a straight jet or prop-jet will be used in a particular design is the same as any other form of engineering determination. The job to be done is examined carefully, and the best power source is selected. The pure jet has many imposing advantages. To start with, it is a small package of regular contour. It can be buried into a wing or fuselage allowing singular aerodynamic cleanliness. This is true in the prop-jet but to a lesser degree. Because the prop still must be kept off the ground during take-off, a long landing gear is still necessary.

The serious debits for the pure jet are its mediocre thermal efficiency at low speeds and altitudes and its general inferiority in take-off and climb characteristics to parallel propeller airplanes. In some designs, thrust augmenters like Jato (jet-assisted take-off) units have been used to increase the mass of air moved rearward. Once the jet plane is airborne, it can climb at a high rate of speed. This differs, it should be noted, from rate-of-climb or climbing angle. The efficiency of the turbine gains steeply as air flows through the compressor, so the faster the plane goes, the more air is fed into the power unit. Because the thermal efficiency of the jet unit is determined by the difference in temperature between the cool and unexpanded air at the intake side and the heated and expanded air that is exhausted under pressure, the turbine engine is more efficient in the cooler upper levels than it is down below. Moreover, as the engine begins to "wind up," the power output increases and the fuel consumption drops, because the air necessary for complete combustion is being made available to the power plant.

Since the fuel consumption of the pure jet is profligate at full throttle-low altitude operation, its usefulness appears limited for the time being to high-speed medium-range operation, or to special types of bombers and transports.

Operational Woes

Various engineering compromises have been made to the patent weaknesses of the jet plane. One of the earliest was the Ryan Fireball, in which a conventional reciprocating engine was placed in front of the plane, while a jet power plant was set in the tail. While the plane was used successfully for both land and carrier operation, it combined the maintenance and operational woes of both a piston and a jet engine. Doubling up of fuel systems, etc., made the life of the service crews somewhat complicated.

Another approach was Consolidated Vultee's P-81, which was designed for long-range escort duty for the B-29 class. This ship has a propeller-type gas turbine in front and a straight jet engine behind, and a total power output equal to the Superfort. While the type was not completed in time to be of military value, it was the first turbo-class fighter to indicate sufficient range to protect the VLR class bomber.

Operational Speed Determining Factor

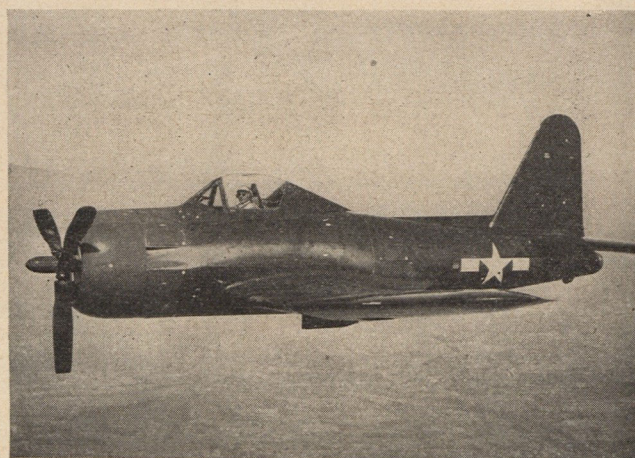
From the point of view of commercial planes, it must be determined what the future transport's operational speed

will be if the prop-versus-jet argument is to be resolved. If we are satisfied that an air traveler merely wants to be able to make his trip to London or to Paris without taking out any of his living time, then a 300-mph cruising speed airplane is enough. The propeller-on-turbine will offer the designer that combination of power and compactness, plus decent take-off, that will make a practical airplane. If, on the other hand, the pressurized 500-mph airplane is what is needed, then the pure jet is the thing.

There are several purely mechanical factors which should be considered in making the jet-prop decision in transport airplanes. To begin with, a heavy and complex gearing system is needed to reduce the 10,000 and more rpm rotor speed of the turbine to the 2,500 range of the average prop. The weight of the propeller itself is no small consideration. A unit capable of absorbing 4,000 hp at 40,000 feet would weigh around 1,500 lbs.

Turbine-prop Combo Next Step

Most forward-looking designers of transport and bomber aircraft see the turbine-prop combination as the next logical



Ryan's Fireball was the first design to combine conventional piston power with jet, to improve take-off. On jet alone, it cruised 300 mph. Having two kinds of engines, it had to carry both fuels and had the combined woes of piston and turbine engine maintenance.

step forward. In the prop-jet, 80 per cent of the energy output is used by the propeller, while 20 per cent jets out of the exhaust as kinetic energy. Power plant sizes from 1,000 to 10,000 hp are forecast in the next five years.

The outstanding advantages of turbines over pistons in future designs have been widely conceded. Simpler in structure and operation, using a safer fuel, they are capable of greater power output per pound of engine. Furthermore, the non-reciprocating nature of the engine and the resultant reduction in vibration allows the use of a lighter propeller. But, whether the turbine will be used alone or with a propeller depends to a large degree on what the designer is willing to pay in fuel consumption and take-off performance for the performance gained beyond 550 mph.

While military speeds, particularly in the fighter-interceptor class, have already exceeded the zone of efficiency for propellers, it may be a decade or two before superbombers and supertransports zip along at these speeds. In the realm of flying for profit, at least, the plain old airscrew that got the Wrights off the sands at Kittyhawk may still be the prime mover for some time to come.

The battle for supremacy of the world's commercial air lanes promises to be as rough as any wartime dogfight. The two main protagonists will be the United States and England

You can count on it. Peacetime supremacy of the air will soon become a battle as violently contested as was the wartime struggle between the Luftwaffe and the Allied Air Forces. There won't be guns, of course, because the converging scuffle will be one of economics. But there won't be gloves either. It will be a match of bare fists and knuckle dusters.

The main protagonists will be the commercial airlines of the United States and Britain who have been priming themselves for nearly ten years—ever since Pan American and Imperial (English) first vied with one another for commercial supremacy over the Atlantic in the middle and late thirties.

The Pan Am-Imperial affair was a sparring engagement. The bell rang for the main event when the last war ended.

Happily for Uncle Sam's supporters, the U. S. has entered the ring with several advantages. During the war we manufactured a number of military transport planes which could and have been converted into commercial ships with very little effort and expense—and, still more important, in a relatively short time. The Douglas C-54 was old and battle-ried by the time the war was over, and considerable numbers of them were available to international air carriers at bargain prices. Likewise, the Lockheed Constellation and the Boeing Stratocruiser, which were developed as military projects, were able to make a quick change into civilian garb with very little trouble. Even the XB-36, Convair's six-engined giant, was built with a commercial mock-up right beside it.

The English, on the other hand, had practically no military transports which they could convert for commercial purposes. About the best they could do was modify a few Lancaster, Wellington and Sterling bombers.

Another edge the U. S. enjoyed was the fact that during

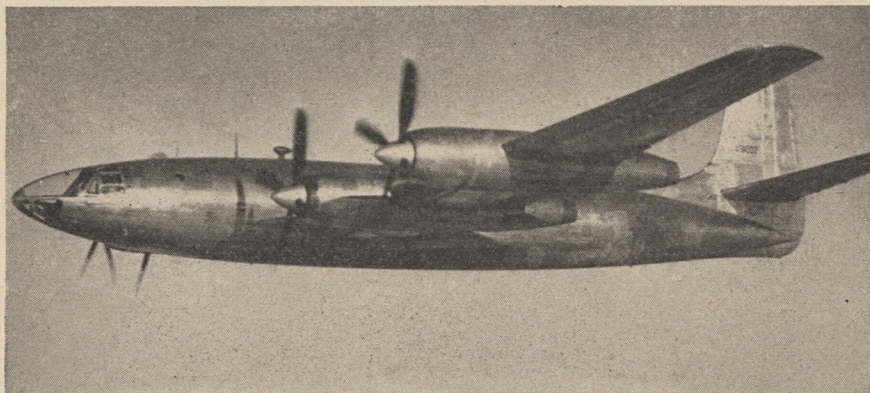
the war the AAF established and developed the largest air transport system the world has ever seen. Air Transport Command bases were built in every corner of the earth, from Ciampino to Atsugi. When the war ended, they were made available, under contract, to commercial lines. Men who had once flown for ATC, in many cases, now flew for the commercials. They knew the routes like the back of their hand.

But Britain has also entered the fight with certain advantages. One of the most important is land control. Britain's sea power has spread her influence over the globe. A study of the map accompanying this article will indicate the extent to which the British Overseas Airways Corporation's lines are supported not only by portions of the United Kingdom but also by those states which are under its control or direct political influence. Compare this with the U. S. system, most of which operates over routes protected only by reciprocal treaties which are subject to political pressure from direct competition.

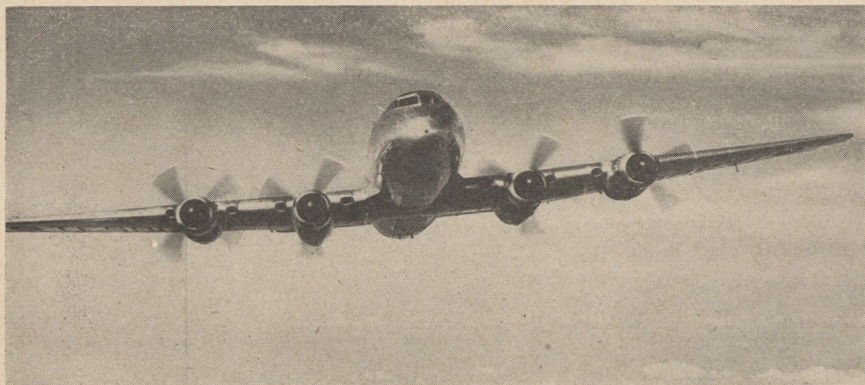
The tussle between the U. S. and Britain will make interesting study for students of economics in future generations. Seldom in history has an issue been so clean-cut. The British enter the international fray with B.O.A.C., a "chosen instrument"—a private company under government control, a form of limited monopoly supported with subsidies if necessary. In the U. S., on the other hand, some nine companies are operating in the international business. Pan-American Airways, which pioneered many of the oceanic routes, has been thumping the tub for an all-American flag airline in the pattern of B.O.A.C. Their claim is that the system of free competition, where several lines carry the flag overseas, places the U. S. in a weaker position. The opponents of this theory claim that free competition among U. S. lines will produce service and

POST-
WAR

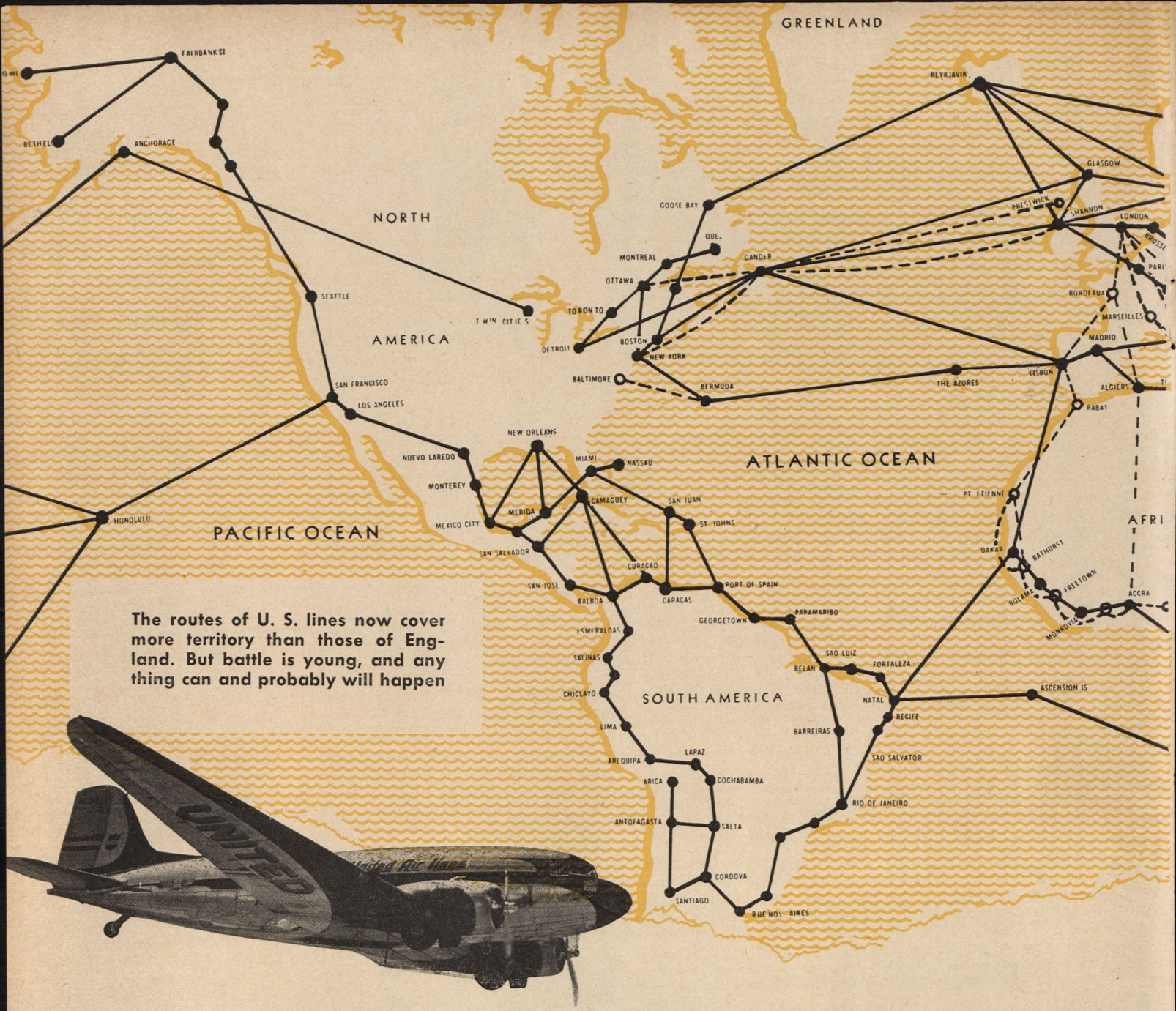
England's best heavy transport is the Handley Page Hermes. Cheaper labor cuts per pound cost $\frac{1}{8}$ under U.S. types.



At the present U.S. can claim the world's fastest transport in the Republic Rainbow (above). England has no contender.



AIR
BATTLE



schedules of a caliber so high that the foreign monopolists, slowed down by the lack of competitive spirit, will gradually slip from the race.

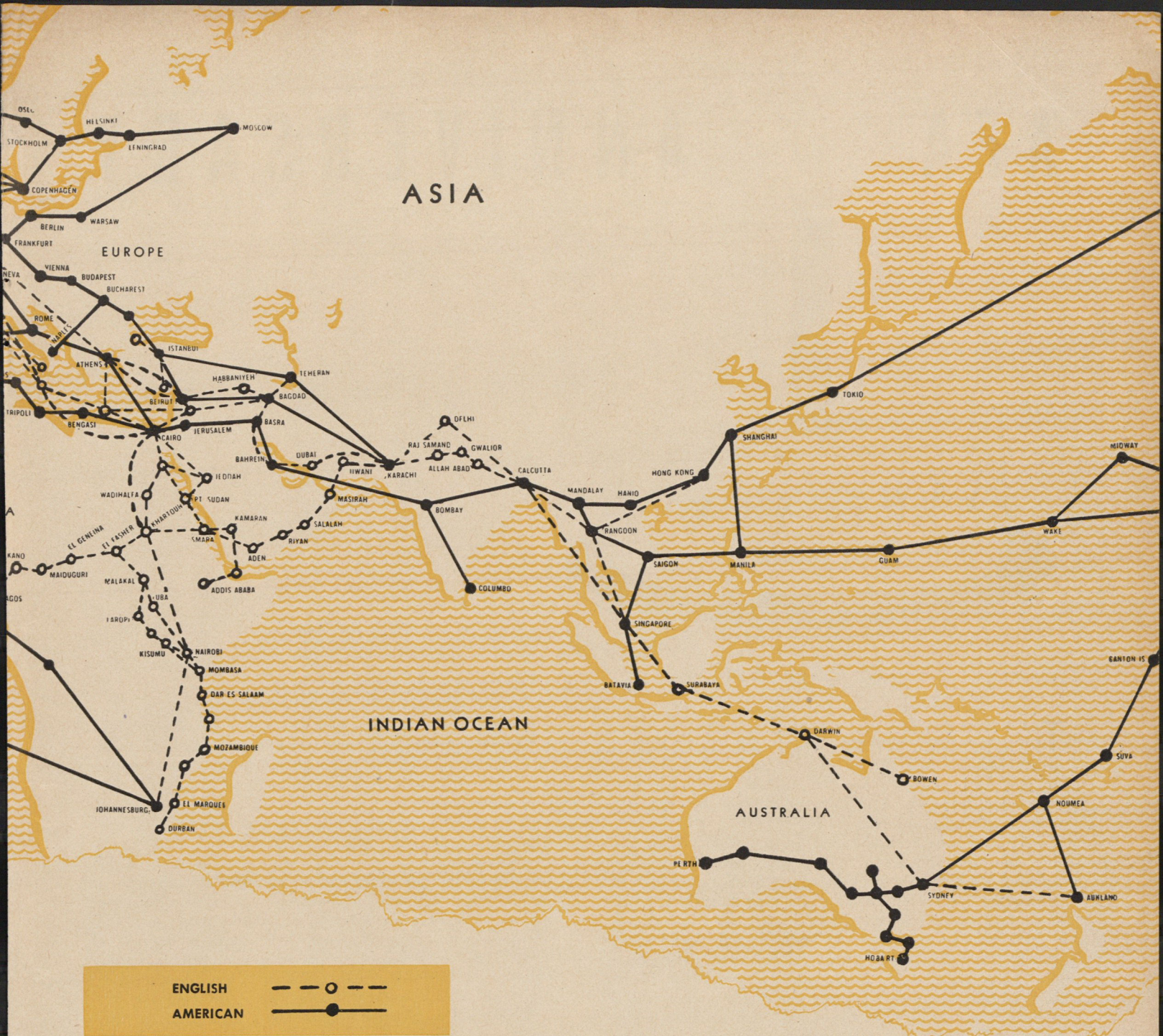
In Britain the opponents of the chosen instrument idea are not the airlines but the manufacturers. The people who build the planes state that, if there is only one international airline per country, the variety of aircraft produced will be limited. To them, having but one domestic customer presents a serious problem. It means that most of their transport craft will have to be exported if their industry is to survive. This fact has not, however, prevented the British Labor Government from letting large numbers of developmental contracts. England is exhibiting an almost grim determination to produce transport airplanes that will lead the world.

For instance, the British have developed a jet power plant

and a gas turbine to a degree where they are about ready to strip piston engines out of everything in the plus-thousand horsepower class. The flying wing, developed chiefly in the U. S., is being investigated in England, and plans for a giant sans-fuselage type are in the works. British designers know that U. S. airlines are notoriously slow in adopting new aircraft ideas. They remember, for example, that Vince Burnelli, the U. S. designer of the lifting fuselage, could not sell his idea to the American transport people in a full quarter-century of effort, and they are cognizant that the U. S. lethargy in this department is a decided break for them. All they have to do is sell one agency instead of a dozen different airlines on a progressive idea. If that one agency likes it, they're in, and English design moves that much ahead of U. S.

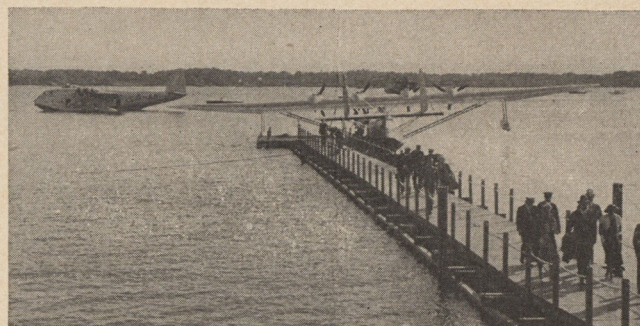
One more matter favors England. Because of the relatively





lower standard of living enjoyed by her workers, the cost of building and operating transport aircraft is considerably lower. There are not enough airplanes built in peacetime in either the U. S. or England to have the mass production principle show to advantage. The British tacitly admit that in the field of private planes. Yankee production can turn out greater numbers at less money. But in the field of multi-engined transports, it is still a job of custom manufacturing to a great degree. Then too, British crews and supporting personnel, with the exception of top executive men, draw lower salaries than parallel employees in the U. S.

So, armed with this pre-flight dope, civilization watches these two gladiators climb into the arena. There is little doubt that eventually one will come out feet first. That is, if the audience doesn't get excited and join in the melee.



Pan American brings one of first loads of English passengers to U.S. as British Imperial ship rides at anchor. This was war's start.



AFA

ANNIVERSARY



*AFA reaches its first birthday
with hopes for future after a
year of organizational problems*

THE end of this first year for AFA finds the objective of keeping the members of the world's greatest Air Force together shaping into reality as thousands of present and former AAF men and women band themselves into one group with one purpose—the AAF and air power moving ahead with typical AAF spirit and teamwork.

AAF folk have been scattered far and wide as they shed their uniforms and got back into the prewar harness, but reaching across the distances to get together again through the Association has, despite the accompanying difficulties, proved an enthusiastically welcomed and accomplished opportunity.

AFA has attained a degree of maturity, and like all youngsters has experienced some rather painful hours getting there. One might, for example, dwell momentarily on the war-borne problem of getting the emblems out to the members. The manufacturer couldn't get metal; the AFA couldn't get delivery; and members couldn't get the wings-and-circled-star on their lapels. That one lasted for weeks, but it finally straightened out. Membership cards and lapel emblems go out to members within three days.

Obtaining an adequate staff was something else AFA sweated out, too. And then, there was the paper shortage and how to get envelopes in large quantities.

If these items proved harassing from day to day, they were more than balanced by the fine cooperation and assistance by AAF men and women all over the country.

As the family group or professional society of the Army Air Forces, the Association has had the endorsement and hearty support of the AAF. Thousands of the men on active duty in the U. S. and overseas have joined as associate members, led by General Carl Spaatz, Associate Member No. 1.

In July, AIR FORCE magazine joined the AFA and became the official journal of its membership. Bigger and better issues are the continuing goal for it.

In the brief period since its formation, the AFA has participated in a number of nation-wide activities and ob-

servances. A booth was set up at the National Aviation Show in Grand Central Palace, New York City, last April. This was the organization's first public membership drive and brought gratifying results including the signing up of Mayor O'Dwyer as a charter member.

In several states across the nation, former AAF personnel responded to the request of AFA headquarters to represent the Association in its Memorial Day commemoration of the airmen who did not return and who are still missing to their families, their comrades and the AAF they served so valiantly and so well. Back in Washington, while B-24s scattered flowers over Arlington National Cemetery, a representative of the Air Force Association placed a floral tribute at the Tomb of the Unknown Soldier, a silent solemn dedication to airmen all over the world who fought through to victory.

Air Force Day, August 1st, marked a high point in AFA national recognition. Besides a coast-to-coast network broadcast featuring such prominent members as General Spaatz,



In midsummer Gen. Spaatz named Glenn Miller orchestra led by Tex Beneke official AFA band. Don Haynes (right) is manager.

General Doolittle, Jack L. Warner, James Stewart and Meryll Frost, the Association received widespread editorial support in many of the nation's leading newspapers.

In November, the Association participated in the National Aircraft Show at Cleveland.

The bulk of the first year's effort was directed, however, to the organization and membership campaigns. Substantial leaders in all the states accepted the invitation of President J. H. Doolittle to head up the Wing formation program.

This was a step preliminary to the activation of local Squadrons wherever there are twenty or more former members of the AAF.

The initial big Squadron meeting was held at Baltimore in June with W. Stuart Symington, Assistant Secretary of War for Air, General Spaatz and President Doolittle as the principal speakers. More than 700 former members of the Air Forces attended. The first big Air Wac Squadron was also organized at Baltimore.

The Wing program moved with an increasing tempo during the year, with a basic unit completed in all the states within the twelve-month period. The Wings had distributed hundreds of Squadron organization kits by the year's end.

Several organization techniques were developed during the year. In Ohio, the Wing divided the state into ten districts with a Group Commander for each. These Group Commanders became responsible for the activation of Squadrons within their assigned territories.

In the great state of New York, the Wing fostered Squadron activation with a series of meetings in the larger cities such as Buffalo, Albany, Rochester, etc.

Out in Montana, the state leader organized on a county basis, with a former AAF member appointed in each county to activate a Squadron.

With the increased number of Squadrons in being throughout the nation, programming became the paramount problem. There was general recognition of the fact that to ensure continuing interest and enthusiasm it would be necessary for the

Squadrons to adopt and execute vigorously planned programs of activity. Before the year's end many of the Squadrons had demonstrated ingenuity and originality in the development of such programs. Meantime, from headquarters went a broad outline of proposed Squadron activities.

The Paducah, Kentucky, Squadron was in the first class during the AFA's first year with an unusual and beneficial activity. A surplus nonflyable B-17 was acquired and became the classroom for a troop of Air Scouts. Squadron members lecture the Scouts regularly on navigation, radio, radar, etc.

In Phoenix, Arizona, the Squadron is sponsoring an aeronautical theory class in the local high school by guaranteeing the laboratory fees of the students who wanted to fit it into their curriculum.

But no stereotyped programs are being planned for Squadrons by the national headquarters. Just as in war years when the Air Forces followed the policy of outlining a mission and leaving its successful completion to Wings, Groups and Squadrons throughout the world, methods for reaching major aims are left to AFA Squadrons.

Program, publicity, and membership committees already have their tasks outlined, with a knowledge of the importance of their rôles in preliminary organizing activities.

Meanwhile, Squadrons are exploring the possibilities of both flying and mechanical training, with national headquarters carefully watching developments in the best methods for carrying these programs to completion.

During its first year, then, the Association's greatest effort has been directed toward organization and development, the attainment of a stature sufficient to make its influence felt whenever and wherever needed in the accomplishment of its objectives. It is to the continued accomplishment of these objectives that we now look forward, confident in the knowledge that AAF men and women everywhere are enthusiastically participating in activities dedicated to the Air Force they were proud to serve and to the nation which that Air Force can and must keep safe for future peace.



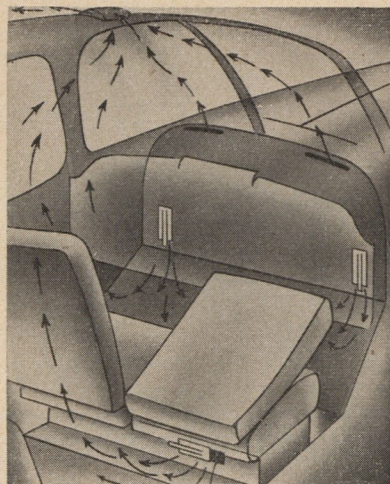
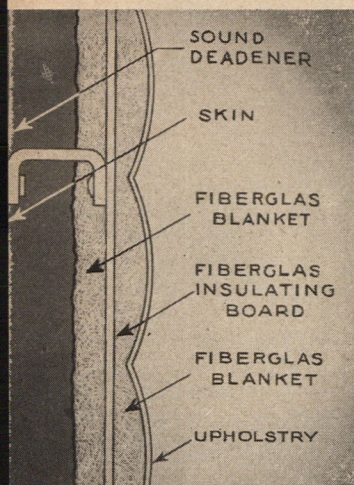
In January, soon after AFA was activated, a number of the association's officers and directors called on President Truman at the White House. From left: James H. Doolittle, Willis Fitch, Forrest Vosler, Pres. Truman, Thomas G. Lanphier, Jr., Meryll Frost, James Stewart.



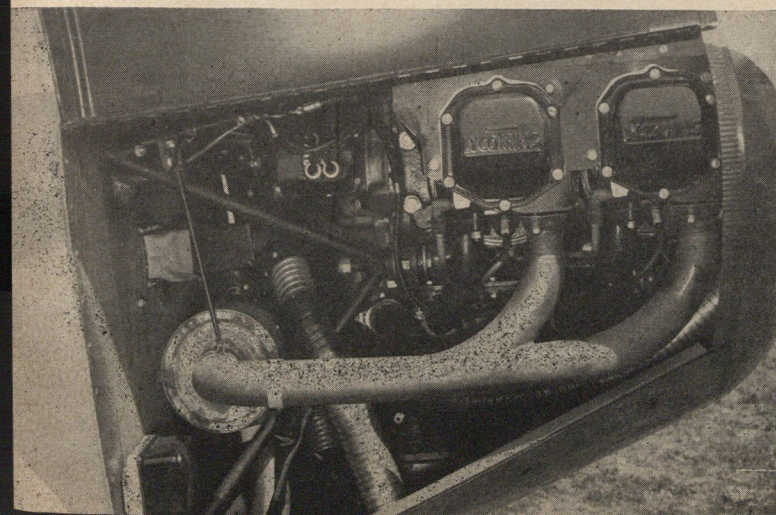
QUIET PLEASE

Multitudes of wings, crowding today's skies, have resulted in a public clamor for less racket from above. Mufflers, special propellers and quieter power plants are engineering's answers in the immediate future

BY STEVEN WILLIAMS



Quieting the inside of the airplane is comparatively easy. Insulation and proper ventilation, like the setup used in the new Beechcraft Bonanza, stifle the decibels and make the cockpit quite livable. The power plant is another matter. Piper Aircraft pioneered use of a stainless steel muffler, like the one shown below on the Supercruiser, as far back as 1938, but it proved only a partial solution.



IN 1921 a pilot, now internationally famous, had to defend a damage suit brought by an Iowa farmer. The bill alleged that "said operator of the aeroplane did fly his craft over the plaintiff's pasture at an extremely low altitude. The noise caused thereby frightened the dairy stock therein, causing them to cease lactating."

While complaints against noisy airplanes have become a little more logical in the last quarter-century, the squawk is still there and is still, to some extent, justified. The amount of opposition that the national airport program is encountering in the immediate neighborhood of proposed landing sites indicates that the noise factor is a major consideration.

CAA Administrator T. P. Wright recently told a Washington reporter that the Administration was doing all it could to induce pilots to consider the detrimental effect of noise on the industry. By this he probably meant to restrain some of the flyers who like the sound of their WAA-acquired BT-13s buzzing around with prop in flat pitch.

Three things make noise in an airplane. The propeller, of course, is the major offender. Back in 1936, a Russian scientist named L. Gutin published a paper in which he stated that the noise generated by a whirling propeller was the result of the steady aerodynamic forces, thrust and torque, which were imparted to the air and propagated through space at the speed of sound in line with the laws for sound propagation.

The next major offender is the exhaust system, which produces sounds not unlike whistling in its general dynamics, caused mostly by gases rushing out of confinement.

The last offender is the engine itself: the explosions inside the cylinders, the mechanical noises of valves opening and closing, the clatter of the accessories. All of this sound is re-vibrated and resonated by the comparatively hollow structure of the modern airplane.

The lack of scientific effort to silence the airplane has stemmed from two sources. The first and probably the most important was engineering unwillingness to sacrifice power or performance to quiet operation. When Eddie Stinson put the first commercial cabin monoplane on the market in the late twenties, he attempted to sound-insulate with Balsam

Wool. While this was a comparatively crude attempt, it showed a realization that pilots were sick of the clatter and that the public wanted to be shielded not only from the elements but from noise. During the first World War, automobile-type mufflers were installed on night bombers, to cut down noise and hide the exhaust flame as well. It was discovered, however, that the muffler caused back-pressure in the exhaust system and generally reduced the power output.

Until very recently, of course, there were not enough airplanes around to make their noise a major nuisance. Every designer was too anxious to put every ounce of airframe, power plant, or accessories to work in performance to consider what the plane sounded like to the general public.

The second reason nothing was ever done was simply laziness on the part of both operators and manufacturers. Airplane sounds were familiar and darned near pleasant to the people in the aviation business. Whatever pressure was applied to keep the noise-level down came from the outside.

The first attempt to silence airplanes was an airplane muffler. One of the pioneers in airplane muffling was Bill Deihl, Early Bird and noted flying instructor in World War I. Deihl started experimenting with mufflers back in the barnstorming era, on the theory that the noise scared the customers. He started with perforated tin cans slipped over the exhaust and came up, just before the war started, with a muffler-flame-dampener for planes up to 300 hp.

Virtually every new lightplane is equipped with an effective exhaust muffler. Ryan Aircraft, long known as an accessory manufacturer as well as an airframe builder, recently announced an all-stainless steel exhaust muffler for opposed-type engines in the 65- to 85-hp class. The muffler allows the exhaust gases to cool momentarily in an expansion chamber before they are released into the outside air. This stepping down of the expansion process not only eliminates 90 per cent of the exhaust "pop" when the expanding gases finally escape, but also allows the dissipant temperatures to be used for such purposes as carburetor and cabin heat.

Dr. Otto Koppen, famed aerodynamicist at Massachusetts Institute of Technology and designer of the spinproof Skyfarer, recently announced the patenting of a device called the "Puffer." While it is essentially a device for cooling an air-cooled power plant without the use of open-lipped cowlings or mechanical fans, the system effectively quiets the exhaust noises to a surprising degree. Basically, it is a jet pump which puts the exhaust heat to work drawing in the air for cylinder cooling. However, during this process, the Puffer steps down the expansion process and reduces the exhaust sound level.

A quieter engine as such is a complex engineering problem. The use of dynamic crankshaft balancing produces not only a smoother running engine but a quieter one.

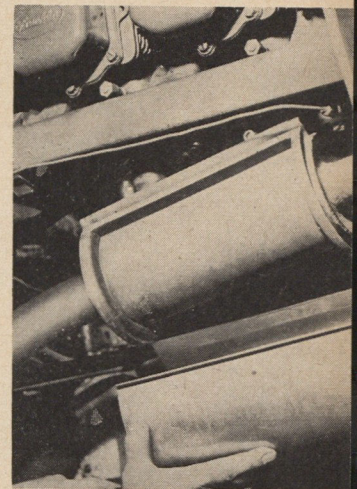
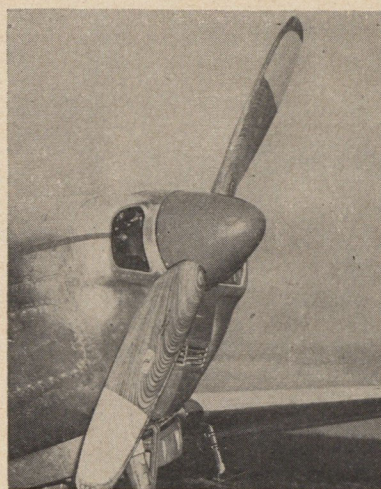
According to Gutin, every time the prop spansks the air, noise is produced. The faster the propeller tips move, the greater the sound. While the shape of the propeller blades may have some bearing on the noise, the general formula for quieting the propeller is to get the tips' speeds as far away from the speed of sound as possible.

Tests conducted by the National Advisory Committee on Aeronautics recommended the adoption of multi-blade propellers as a method of cutting down sound. The tests were conducted on the basis of a Cub-class propeller, and it was determined that, at the operational speeds of the average lightplane, the amount of efficiency lost by the use of a multi-blade propeller is negligible. In a larger airscrew, where every bit of power must be wrung out, the business of the extra blades gripping disturbed air is a real consideration. The NACA's seven-bladed experimental propeller was practically a soft purr at cruising rpm's.

The manufacturers of lightplane propellers, on the other hand, object to accepting, exclusively, the onus of noise reduction. They point to the larger power plants that not only



Aviatrix Betty Hughes shows the exhaust of the new Ryan muffler system for 65-85 hp engines, which reduces exhaust noises 90%. Like the setup in the Stinson Station Wagon, below, right, it also provides cabin and carburetor heat. Controllable pitch propellers, like the Beech electric, allow operation at a minimum rpm thus reducing noise-producing propeller tip speeds. Blade shapes can also help.



increased operational efficiency but reduced noise levels by the use of gear reduction. They indicate that the additional weight of a gear reduction system can be absorbed without ill effect by the average lightplane design. The feeling among many leading lightplane propeller manufacturers seems to be that the rpm's should be cut down before they get to the airscrew. The expense in adding the blades and mechanism might skyrocket the cost of an already expensive component. The constant speed propeller in itself has done much to quiet the clatter. The propeller people feel that in a semi-fixed installation like a reduction gear system the same results could be accomplished at less expense in original outlay and operational servicing.

The comforting thought is that something is being done. Virtually every lightplane propeller manufacturer has at least looked into the problem of multi-bladers for light aircraft. Several of them are known to be building experimental units, to satisfy future needs if public pressure demands this kind of reform. In the meantime, the CAA's desk piles high with ladies' complaints that the Cubs keep them from sleeping. Considering the fact that a lightplane makes less noise than a trailer truck and only one-quarter the total sound impact of an elevated train, much of the complaint seems to be in the old dry-cow category. However, if making the airplane noiseless will help get new airports for an expanded aviation future, the effort—both scientific and mechanical—may pay dividends in the long run.

ILLUSTRATED BY WILLIAM VON REIGEN



BY COREY FORD and ALASTAIR MacBAIN

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WE even had a tree. It wasn't much of a tree; but it was pretty good for the Aleutians, where for a thousand miles there isn't a shrub higher than your knee. No, that's not quite true: there's one tree, on Umnak Island. A couple of Army pilots flew it all the way from the Alaska mainland, and today it stands inside a wooden stockade with a big sign "Umnak National Forest." The men pause in front of it now and then and stare at it in silence. It's funny how you get to long for the sight of a real tree, after a while.

Nothing seems quite real, as a matter of fact, out here at our most advanced base in the Adreanofs, two-thirds of the way down the lonely Aleutian chain, only a bomb's throw from Jap-held Kiska, only a thousand-odd miles from Japan itself. The islands, as you fly over them, are no more than a staggered series of sunken volcanic peaks, submerged to timber line, separated sometimes by a hundred miles of open water;

fog-shrouded, obscure, silent as death. Unlike the mainland of Alaska, where the thermometer reaches seventy below, the temperature in the Aleutians seldom gets down to zero; the mountain peaks are perpetually ice-capped but most of the slopes are bare, covered with an olive-drab grass which gives the islands a strikingly military look. Snow falls one day and melts the next; the roads are alternately hip-deep in mud or frozen into a badlands of ruts and holes, over which bump an endless succession of jeeps, tractors, Army trucks. The men live in square khaki tents, or in round-topped sheet metal quonset huts, dug deep into the hillsides at crazy angles, amid a never-never land of revetments, trailing telephone wires, fox holes, concealed gun emplacements. The wind howls day and night with a steady banshee wail; seals and sea lions plunge in the seething surf; the ubiquitous ravens wheel and bank and race the patrol planes overhead. The treeless

*There were no turkeys or plum puddings for Christmas dinner in the Aleutians in 1942.
But there was a tree—made out of tundra moss fastened together with baling wire*

hills around you are as unreal as the other side of the moon.

But the mud is real, and wet feet are real, and going without fresh meat, or milk, or eggs, or fruit, is real. Not getting any mail from home is real; there hadn't been a mail boat for two months when I arrived. No shower baths, no entertainment, no towns to go to, no women for a thousand miles, is real. The waiting is real: that's the realest thing of all up here. Waiting for the weather. Waiting to try another bombing-mission over the target. Waiting for your wings to ice up, perhaps, or the field to sock in behind you, or your plane to crash against an uncharted mountainside in the fog. Every man who flies here carries an undated death-warrant in his pocket. Sooner or later he knows the weather will get him, sooner or later he won't get back. Waiting for that, day after day, is very real. . . .

It's a sort of forgotten war. You don't hear much about the Aleutians. Oh, maybe you hear of them once in a while. Maybe you read a brief Navy communique, buried somewhere on page fourteen, stating that our land-based bombers—that's Army bombers, in case the Navy communique doesn't make it clear—attacked enemy shipping again in Kiska Harbor, and scored hits on two cargo ships. The very name of the islands sounds illusory, vague. You're not entirely sure where they are, until you look at a map of Alaska, which curiously resembles a silhouette of Uncle Sam, and you see the Aleutians like Uncle Sam's chin-whiskers wagging far out across the Pacific toward the clutching fingers of Japan. You don't realize, until you measure it on a globe, that they stretch so far west: even the beginning of the chain is five hundred miles west of Hawaii; our base in the Adreanofs is actually parallel with New Zealand; and the Jap-occupied island of Attu, 900 miles from our Naval base at Dutch Harbor, is only about 700 miles from the big Japanese Naval base at Paramashuri in the Kuriles. You are surprised, looking at your globe, to see that the long sickle-curve of the islands slices midway through the shortest route from Seattle direct to Tokyo.

It is a lonely front: the least-known and loneliest of all our far-flung battlefronts. These pilots are not fighting a glamorous war of blazing guns and gallant encounters in mid-air; they fight an unseen foe, and they fly and die alone. Their enemy is the weather. Their battlefield is a boulder-strewn beach scattered with telltale bits of twisted metal, or a snow-covered mountainside where the torn wing of a plane flaps emptily in the wind, or an icy strait into which a flaming bomber hisses into silence like an extinguished cigarette. They do not parachute to safety and a hero's medal; they struggle for a few minutes in the numbing water until their 'chute fills and drags them out of sight forever. Their citation reads "Missing. . . ."

The flying conditions in the Aleutians, winter and summer, are beyond any argument the worst in all the world. These Army bombers go out on missions in weather that would ground any ordinary operations. "We don't think it's too thick to fly," they shrug, "until you can't see your co-pilot." They talk matter-of-factly of hundred-mile-an-hour williwaws, or of snow squalls so sudden that a pilot may taxi up the runway in bright sunshine, and find the field blanked out by the time he turns to head back for the take-off. One pilot told me of flying formation through a fog so complete that he couldn't see the plane directly ahead of him. "All I could do was to come down fifty feet off the ocean," he said, "and follow the wake of its props on the water."

The day's mission is briefed in the Pilot's Ready Hut, down near the line. Each morning, after breakfast, the combat-crews zip on their fleece-lined leather flying-suits and pile into

a recon car and jolt down to the hut through the inky blackness of an Alaska winter morning, hoping against hope that today's weather will be okay to make the run over the target. They pack in the car ten deep, sitting on one another's laps, draping themselves along the fenders, straddling the radiator, singing. "It's a grand old flag, da da da da, da da . . ." "I bet I've logged more hours in this recon than I have in the airplane." "I thought I'd wait till I found out if we were going on a mission this morning before I took a laxative." "If we go on a mission, pal, you won't need a laxative." "Da da da, da da . . ." "Anybody checked the weather?"

In the Ready Hut there is a large plaster-of-paris relief map of Kiska, resting across the two sawhorses. It is very popular, because Kiska Harbor is just the right size and shape to accommodate the average pilot's rear end. You rest the base of your spine on the Jap camp-area at Salmon Lagoon, the heavily fortified ridges of North and South Head furnish an admirable support for either buttock, and you straddle Little Kiska Island in the harbor's mouth like the pommel of a saddle. If Kiska has been taken, you park instead on one of the benches or lean against the wall and listen. The briefing itself is informal; the squadron commander stands beside a chart on the wall and talks in a low pleasant voice, as though he were outlining a play in football.

"We're going to climb to about nine or ten thousand on the way out. We'll go north of the chain, come around the Volcano to Pillar Rock, turn in toward the island here—" he indicates the spot on the chart "—and make a ninety-degree diving turn. All flights javelin right. First element will use a 6500 base altitude; second element 5500. Start your bombing run about here." He points to the chart again "First element will take the hangars, the second the sub base. Use a loose formation except against fighter opposition, in which case we'll close up as in regular tactics. Shipping in the harbor gets first priorities, of course. Remember, on your bomb-run the co-pilot will maintain airspeed, the pilot flies the ship. Rendezvous five miles north of here," putting his finger on a dot on the chart. "We'll have fighter coverage. In case a peashooter has any trouble, you, Jim—" he jabs his thumb toward a pilot, who nods silently "—will lead it back to the base. Maintain radio silence on the way out. Standard frequency. Any questions?"

"Will we have much Zero opposition?"

"I think so, yes."

"Antiaircraft?"

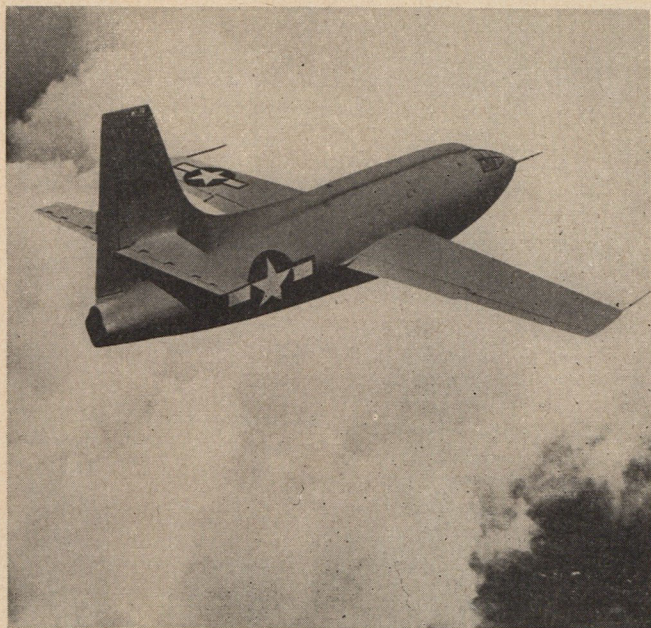
"The Navy communique will state as usual that there was no antiaircraft fire," drily, "but look out for those gremlins." He takes out his watch. "Everybody synchronize their watches. We ought to hear about the weather in an hour or so."

The group relaxes; now there is nothing to do but wait. And wait, and wait. A cribbage game starts up, someone goes to work on a jigsaw puzzle, the men light cigarettes, loosen their flying suits, straddle chairs and read old copies of magazines, fling their leather jackets on the floor and stretch out on them and talk. They talk a language all their own, a jargon peculiar to pilots. "I had to goose it coming in . . ." "Boy, did I sweat it out . . ." "Then I shoveled the coal to it and gunned it around again . . ." Strange vivid phrases strike your ear: flying language. Bend back the throttles. Hang it on the props. Plunk the tail in first. Balloon over the runway. Milk up the flaps. Someone recalls his last mission: "When that Zero came alongside you, Dave, did the Jap look like that one you always see in the movies, the one that grabs his stomach and bends over and goes 'Ugh?'" "Six no trump." "Say, I

(Continued on page 60)

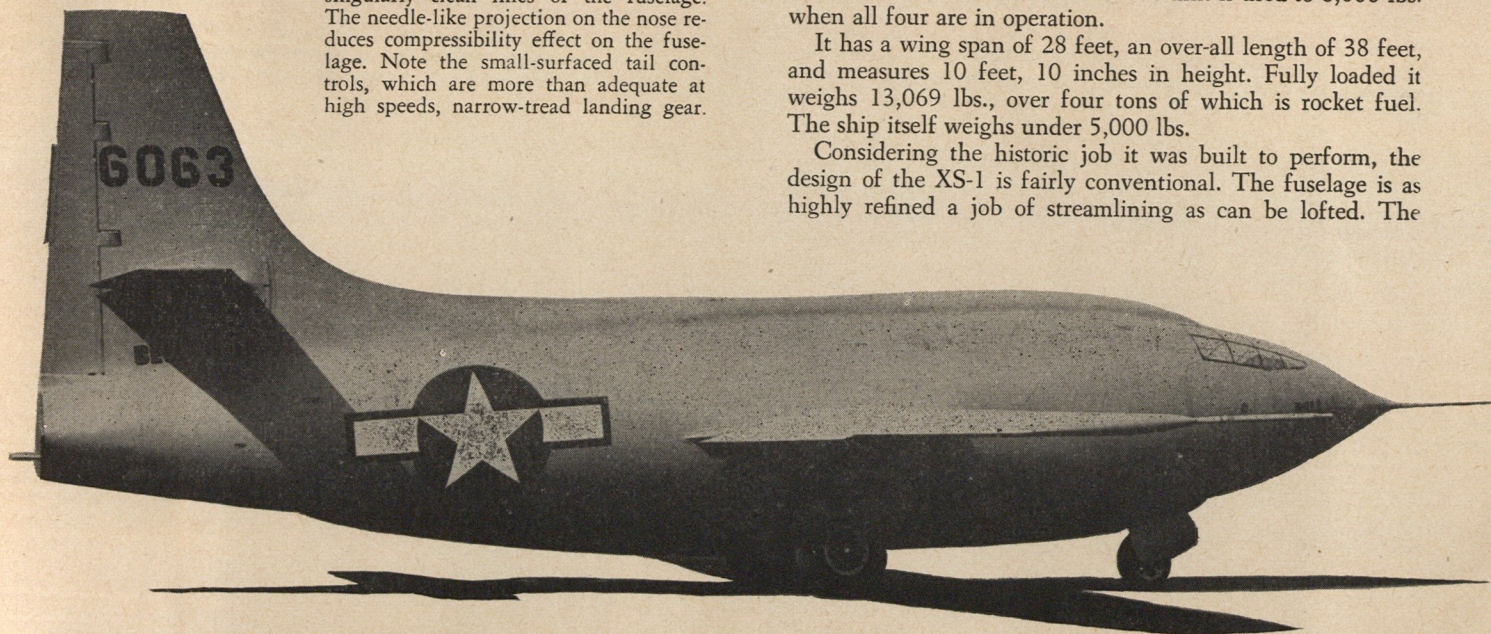
daring the SONIC

BARRIER



To explore the transonic and supersonic speed zones, the AAF, working in conjunction with the NACA, ordered the construction of the Bell XS-1. The winged projectile is powered by a special unit, built by Reaction Motors, Inc. It burns over four tons of liquid oxygen and alcohol in 2.5 minutes and produces 6000 lbs. of thrust. A very sturdy airframe, it is stressed for 1700 mph in level flight.

Profile view of the XS-1, showing the singularly clean lines of the fuselage. The needle-like projection on the nose reduces compressibility effect on the fuselage. Note the small-surfaced tail controls, which are more than adequate at high speeds, narrow-tread landing gear.



As the world of science held its breath, a needle-nosed flying machine, more rocket than airplane, was made ready early this month to pry loose the secrets of transonic and supersonic flight. The craft was the Bell XS-1, whose rocket engine could produce a total thrust of 6,000 lbs.—enough push, it was calculated, to move the ship forward at a top speed of 1700 mph, and more than enough to shove the U.S. far ahead of the rest of the world in this type of aeronautical research. The test was scheduled for mid-December at California's Muroc Army Air Base. Before take-off time the AAF carefully made certain points clear:

1. The XS-1 was not designed as a military airplane. It was instead a piloted flying research laboratory, whose sole function was the recording of data on the effect of transonic speeds on aircraft. It had no armament or armor protection.

2. The first XS-1 was not expected to attain a speed of 1700 mph, because design problems had forced the manufacturers to substitute an alternate power plant late in the production period. The faster model would come later.

3. Early flight work would be "modest" in its goals until the ship had proved itself capable of withstanding unprecedented stresses and strains.

4. The initial flight would be an extremely short one because heavy scientific equipment would limit the ship's fuel capacity. To gain full benefit from the fuel available, the craft would therefore be towed aloft on its first flight by a B-29 and subsequently released to fly under its own power.

In essence the XS-1 is a super-rugged airframe driven by one of the most powerful engines yet produced—a straight reactive instrument which derives its thrust from the burning of alcohol and liquid oxygen. Four such units are incorporated in the mechanism, and the amount of power used is controlled by the number of rockets turned on at once. The thrust can be boosted from 1500 lbs. if one unit is used to 6,000 lbs. when all four are in operation.

It has a wing span of 28 feet, an over-all length of 38 feet, and measures 10 feet, 10 inches in height. Fully loaded it weighs 13,069 lbs., over four tons of which is rocket fuel. The ship itself weighs under 5,000 lbs.

Considering the historic job it was built to perform, the design of the XS-1 is fairly conventional. The fuselage is as highly refined a job of streamlining as can be lofted. The

With the unveiling of the Bell XS-1, the U.S. moves ahead of the world in probing the unknown factor of what happens when a plane breaches the transonic speed zone

closely spaced landing gear folds into the body of the ship instead of the wing, since the latter is a nearly solid structure. Because plastics and glass would probably soften or melt at the speeds anticipated for the Bell ship, a more durable substance is used for the windshield.

The maiden flight of the XS-1 promised, if successful, to answer many aeronautical puzzlers of long standing. How would controls act at supersonic speeds? Prior to the XS-1, the best opinions had been that they would have conventional reactions, but would require mechanical systems for actuating them. The XS-1 had such a system. What speeds could the human body endure? Could the pilot of a supersonic ship take the Gs in a sitting position, or would he have to lie down so that the pull could be taken through his chest? The AAF made no pre-flight announcement on this aspect of the experiment, but observers prophesied that the Muroc test might well presage an era of supersonic speeds in which we will travel from coast to coast on our stomachs.

Another question which would have to wait until after the flight for an answer was what would happen when the "gas" ran out while the plane was moving at breakneck speed. Some experts held that the ship would decelerate in a hurry, throwing the pilot forward against his harness with crushing impact. Other observers guessed that the accumulated speed would wear off at a steady, less dangerous rate.

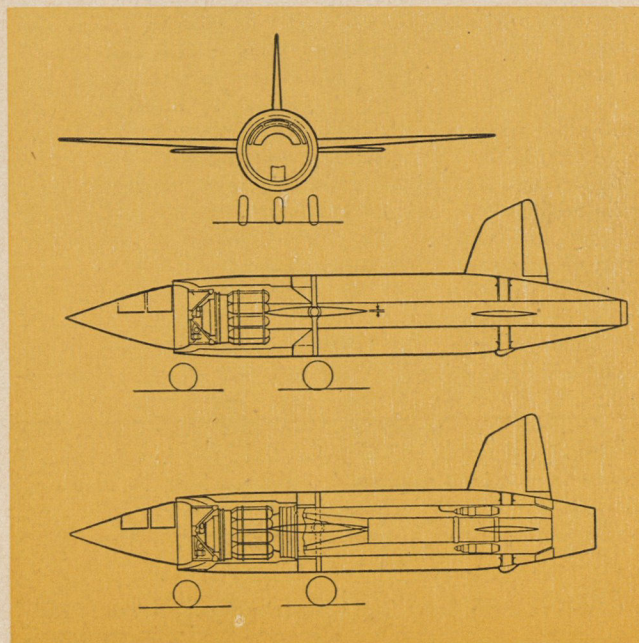
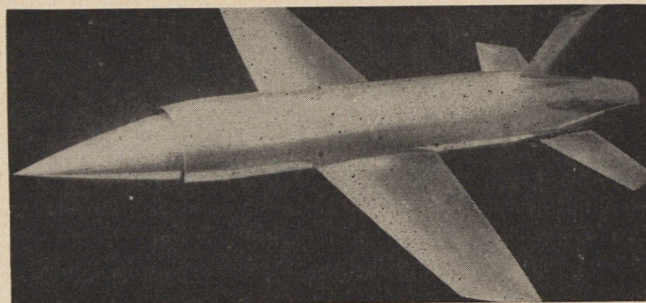
The man selected to find the answers to these and other questions at Muroc was Chalmers "Slick" Goodlin, twenty-three-year-old chief test pilot for Bell Aircraft. A native of Greensburg, Penna., Goodlin learned to fly when he was sixteen. He served with the RCAF and the RAF from February, 1941 to December, 1942, at which time he transferred to the U.S. Navy, with a commission of lieutenant junior grade. He has served with Bell Aircraft since January, 1944 after his honorable discharge from the Navy. He became Bell's chief test pilot in August of this year when Jack Wollams, former number one man at Bell, was killed in a racing plane which he was grooming for the Thompson Trophy Race.


In England, in the meantime, research in the field of supersonic flight has been temporarily abandoned. Construction of the Miles M-52, which might have been the first aircraft to cross the sonic barrier, was halted shortly before it was completed, when an economy wave hit the Air Ministry.

The British Air Ministry cancelled the contract on the Miles 52 a few months before the project was finished. Designed for a 1000 mph velocity, it differed from the XS-1 in that power was to be furnished by a gas turbine. There were two power-plant versions, one a straight jet, the other a jet with thrust augmenters. The 52 had a span of 26 feet. Its length varied with the power plant, 35 and a half feet without the augmentor system, 32 and a half with. The general power layout strongly resembled the original Campini and Leduc designs in that the pilot sat in a cell, isolated from the remainder of the airplane. Miles started the project in 1943 at the request of the Air Ministry. It was probably planned as an overhead interceptor, in case Germany succeeded with her long-range jet-powered bomber program, and managed to get them over England. It might also have been used to intercept V-1 class winged missiles.



The high tail is required to lift the control surfaces out of the burning zone. Despite the unique task assigned to the Bell XS-1, its general wing pattern and configuration is quite conventional.





The story of the Twentieth Air Force's operations in the Pacific has made one of the war's finest documentary films

THE LAST BOMB

THIS month Warner Bros. Pictures is releasing one of the best of the war's documentary films. "The Last Bomb" was shot in 1945 by AAF combat camera units under the supervision of Frank Lloyd, producer of "Blood On The Sun," "The Spoilers," etc. Originally a five-reeler, The Bomb kicked around the Pentagon in Washington for a year before a decision was reached to cut it to a more marketable two reels, and release it commercially. As a result much of the timeliness has been lost, but as a testimonial to the historic impact of air power it has lost nothing.

Tactical plan 574—with which the film deals specifically—is the operations symbol for a flight of 532 Boeing B-29s from Guam, Saipan, and Tinian to Tokyo. It's a plan involving a thousand hours of research, 3½ million gallons of gasoline, 7,980 hours of flying time, and 5,852 crewmen, plus a few odd canine mascots. Like most such flights, 574 runs into its share of bad weather, flak, and fighter opposition—none of which distracts it from reaching its objective and putting its bombs where they belong. The men who participated in flight 574 would probably feel that "The

The Tokyo area would break from behind the clouds just east of Hao-hoiji. This was the pay-off. Twelve thousand feet below, the sons of heaven would soon feel brunt of four thousand tons of destruction.



After rendezvousing at Keta, the "little friends" would follow the Boeing shepherd ship to the assembly point. These were the longest fighter-escort flights on record—seven tiring hours on one engine.

"Last Bomb" has exaggerated the importance of a single day's work. It hasn't. As an unvarnished, unglamorized record of the Twentieth Air Force's part in the defeat of Japan, the film is unequalled.

Getting into the Twentieth's history, it should be recorded that it was General LeMay's boys who almost singlehandedly reduced Japan from a first-rate world power of teeming cities to a political and industrial wasteland.

The 20th Goes to Work

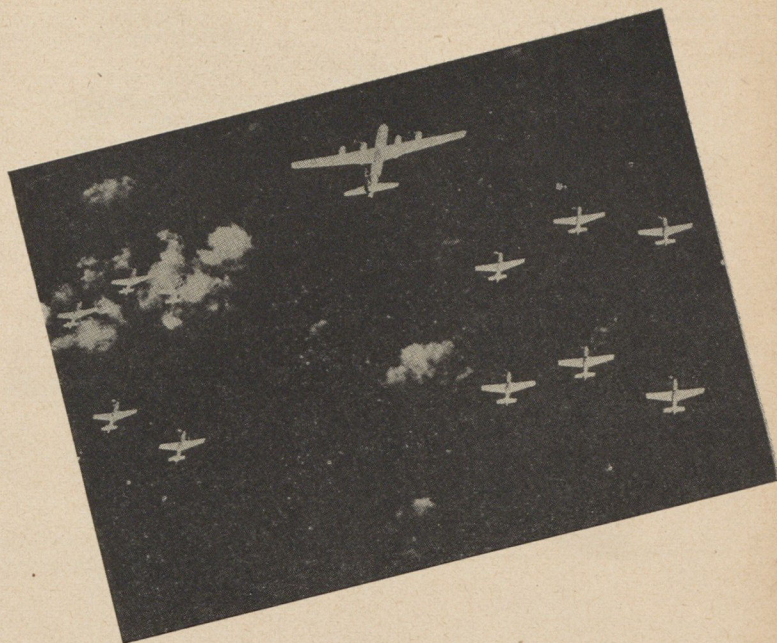
From its modest beginnings in India and China (as the Twentieth Bomber Command, under direction of Twentieth Air Force Headquarters in Washington), the Global Air Force dropped 169,421 tons of bombs in 14 months of operation. More than 160,000 tons fell in the final half year of Pacific-based attacks, when the XXI Bomber Command absorbed the Twentieth Bomber Command and eventually drew its own headquarters from Washington to the Marianas.

The Pacific-based Superbombers laid 12,049 mines in enemy waters, destroyed or damaged 2,285 enemy fighters, wiped out the enemy's major oil-refining centers. In burning down 65 of Japan's most important cities and 158 square miles of urban industrial area, the B-29s destroyed 581 vital war factories, cut steel productive capacity 15 per cent and aircraft productive capacity 60 per cent, wrecked 2,300,000 Japanese dwellings.

In its climactic five months of jellied fire attacks, the Twentieth killed outright 310,000 Japanese, injured 412,000 more, and rendered 9,200,000 homeless. U. S. losses, in contrast, totaled 437 B-29s and 297 crews, or about 3,267 men; and more than 600 airmen from downed Superforts were saved. Never in the history of war had such colossal devastation been visited on an enemy at so slight a cost to the conqueror.

The first B-29 organization to go into the theater of war was the 20th Bomber Command—actually the 58th Wing—under command of Lieut. General Kenneth B. Wolfe. The first B-29 arrived in India early in April 1944, but for many months previous—as early as December 1943—an advanced echelon had been busy arranging for airfields both in Eastern India and Western China. The preparation of these fields—four in each area—was a monumental task, proving that American engineers and more than 350,000 cheerful Chinese coolies could do the "impossible."

The greatest obstacle that stood between the two important field-areas was the jagged Hump of the Himalayas—the high-



est mountains in the world. In order to prevent ground and air units already in C-B-I from being short-supplied because of 20th Bomber Command needs, the B-29 unit began its own logistical flights over the Himalayas, hauling gasoline and other supplies from India to Chongtu.

On June 5, 1944, the first mission was run directly from Indian bases, over the Bay of Bengal, to the Makasan Railway Yards in Bangkok. The next mission, 10 days later, made use of the Western China fields. Target was the famous Imperial Iron & Steel Works at Yawata (the "Pittsburgh of Japan") on Kyushu. Only 47 of the original 75 B-29s reached the target, and damage was not extensive, but the opening gun had been fired and the B-29 Blitz was on its way.

In July 1944, General Wolfe was ordered home to direct B-29 engineering at Wright Field. His deputy, Brig. Gen. LaVerne "Blondy" Saunders, held command through September, and was succeeded by 38-year-old Maj. Gen. Curtis E. LeMay, youngest two-star general in the AAF, who had won his strategic bombardment spurs with the 3rd Bombardment Division of the 8th Air Force in England.

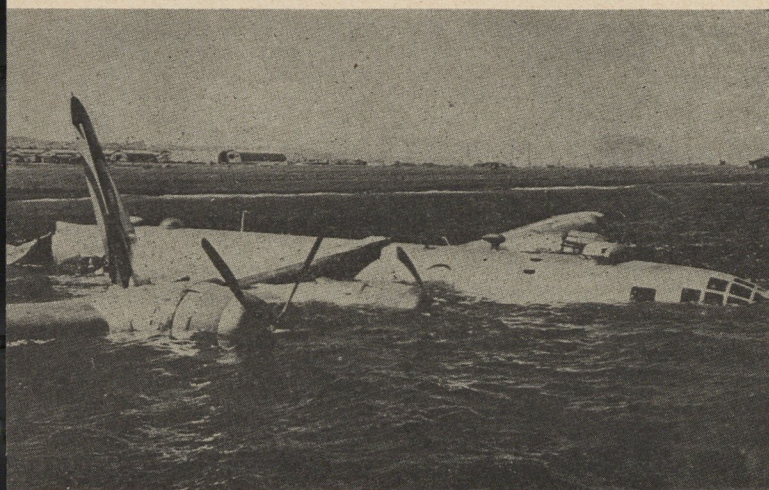
They Bombed by Day

A brilliant tactician, known for his blunt, forceful methods of operation, General LeMay switched from night attacks to high-level, tight-formation day bombing. Enemy damage increased immediately.

One of the highlights of the Twentieth's operations was the series of October strikes against Formosa. The important Okayama Aircraft Assembly Plant, struck twice within three days (October 14-16), was almost totally annihilated. Two important airdromes, Heito and Einanssho, were blasted on October 16-17. The result of these strikes was to hamper severely the enemy's efforts to send aerial reinforcements to the Philippines, which in turn gave material aid to the American invasion.

With Superfortress production increasing rapidly in the States, the first B-29 arrived in the Marianas in early September, piloted by Brig. Gen. Haywood "Possum" Hansell, Commanding General of the 21st Bomber Command. A week later, planes of the 73rd Wing began to filter in for training

Sometimes, unable to make the emergency field at Iwo Jima, a Superfortress would drop in to show the boys an expert ditching. In three months nearly two thousand crippled or gas-shy B-29s havened here.





flights. Between flights, the men knuckled down to building their own barracks, mess halls and operations shacks.

The first mission, in late October, was a shakedown flight to Truk, battered Jap supply bastion in the by-passed Caroline Islands. On November 1, the B-29 "Tokyo Rose" was the first Superbomber over Tokyo, flying an important reconnaissance mission.

The 21st Bomber Command really launched its aerial drive on Japan on November 24 with the first raid on Tokyo proper. Approximately 80 B-29s, led by Brig. Gen. Emmett "Rosie" O'Donnell, ranged out 1,500 miles to hit the third largest city in the world.

Going completely counter to all previously accepted tenets of American air doctrine, LeMay soon adopted area bombing as necessary in the war against Japan because Nipponese industry was concentrated in tens of thousands of small semi-household shops—"shadow factories"—embedded in the heart of the cities.

April not only brought added strength to the 21st Bomber Command, which had been welded with the 20th, but also the use of a new and highly effective emergency base—Iwo Jima. Wrested from the Japs in March by some of the bloodiest fighting of the war, tiny Iwo, situated between the Marianas and Tokyo about 500 miles north of the B-29s' home base, soon became an emergency haven to Superforts which ran out of fuel or were too badly shot up to get home. Hundreds of planes and thousands of crewmen were saved through its use during the next four months.

Assured of its new technique by the success of the 10 March fire raids, the 21st Bomber Command opened up a 4½-month incendiary campaign which burned out the heart of 44 enemy cities. One by one, the principal cities of Japan received their devastating bath of fire.

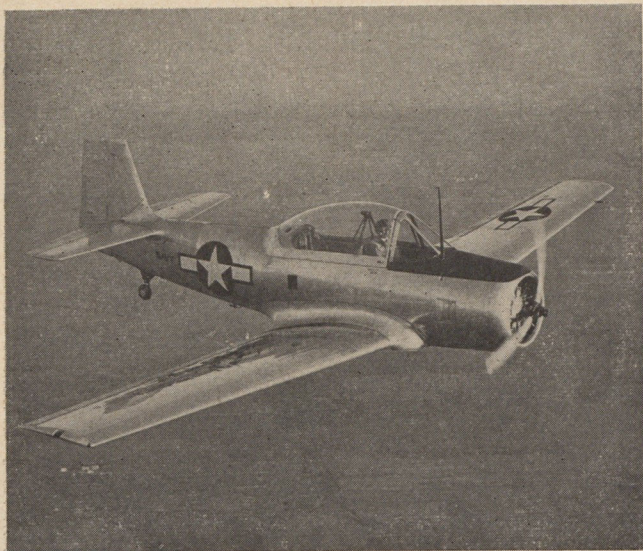
These raids culminated in the first two weeks of August with the dropping of 25,000 tons of fire and explosive bombs on 14 scattered cities, the world-shaking August 2nd mission when 855 B-29s scourged six cities with 6,632 tons of sudden death, and the dramatic single-plane raids of August 5 and 8 when two atomic bombs almost completely demolished Hiroshima and Nagasaki.

The 1945 application of American Air Power, so destructive and concentrated as to cremate 65 Japanese cities in five months, forced an enemy's surrender without land invasion for the first time in military history. Because of the precedent-shattering performance of the 20th Air Force from March to August 1945, no U. S. soldier, sailor or marine had to land on bloody beachheads or fight through strongly prepared ground defense to insure victory in the Jap home islands of Honshu, Kyushu, Hokkaido and Shikoku. Very long-range air power gained victory, decisive and complete.

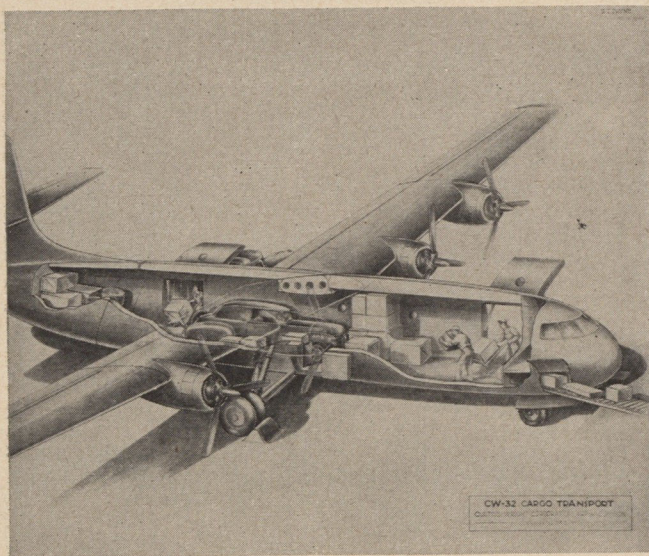
Thus, the 20th Air Force, youngest and most powerful AAF organization, closed a dramatic 14-month career and won an unrivalled place in the air annals of World War II.

Fujiyama, above left, was a familiar white beacon on bloody trail to Tokyo. Sometimes a battle-weary Superfort, like the one below, limped back to base only to collapse at last heartbreaking moment.

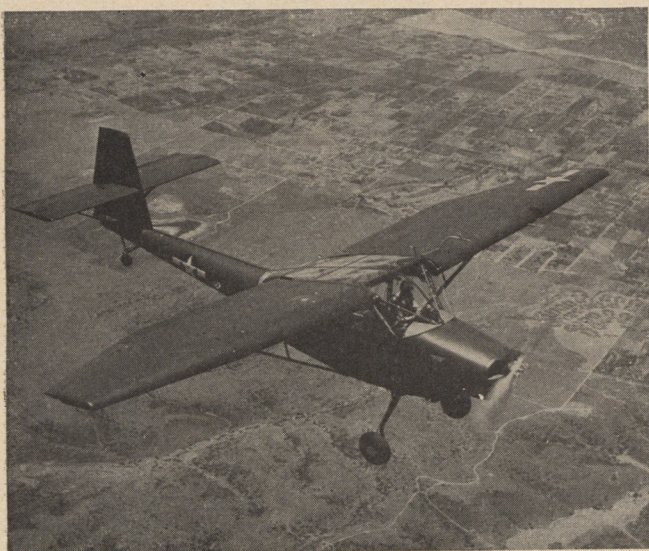




World's fastest primary trainer, the Fairchild XNQ-1 is equipped with all the features of carrier aircraft. Top speed is 170 mph.



Floor of proposed Curtiss-Wright CW-32 cargo plane is 45 inches above ground. Hinged tail admits bulky loads like automobiles.



New flying jeep, Convair's L-13, can take off in the span of the B-36, 230 feet. Prop on, it can be towed at 150 mph and released.

NEW WINGS

AMONG the new aircraft recently announced for military and commercial use, the three that show the most direct influence of war-earned information are the Convair L-13, the Fairchild XNQ-1 and Curtiss-Wright's CW-32 cargo plane. While it was virtually impossible, during the pressure of wartime production, to refine all of the "ideas," a year's breathing space has given the industry leisure to consolidate the engineering gains.

The Convair L-13 is the logical successor to the famed "flying jeep," the Stinson L-5. Most of the liaison planes used during the war were adaptations or modifications of commercial-design private airplanes. Even the L-5 was a stepped-up second cousin to the prewar Stinson 125. The L-13 starts from a radically different engineering assumption. It is a four-place all-metal high-wing monoplane, powered by a 245-hp Franklin engine. It has a span of 40 feet 5.5 inches, over-all length of 31 feet 9 inches and maximum height of 8 feet 5 inches. Cruising speed is 92 mph, range is 368 miles.

The L-13 has many unusual features that make it one of the most versatile airplanes ever built for the liaison field. The wing is fitted with leading-edge slots and exceptionally deep flaps, which, to a great degree, account for its 230-foot take-off and 227-foot landing run. Provision is made for folding the ship's wings flat alongside the fuselage. The elevators also fold upward, thus decreasing the folded width of the craft. The wheels can, under these conditions, be switched from the outside to the inside of the landing gear legs, thus decreasing the flight tread of 92.58 inches to 61.6 inches for towing on the ground and over rough terrain.

The craft can be used for observation, courier service, wire laying and the other tasks usually given L-class ships. As an ambulance plane, it can carry two litters, attendant, pilot.

Fairchild's XNQ-1 Naval trainer, the first military PT of postwar vintage, is powered by a 320-hp Lycoming nine-cylinder radial. It incorporates a general cockpit layout similar to standard carrier-based airplanes. The cockpit, enclosed in a one-piece bubble canopy, offers virtual 360° visibility. An all-metal airframe, the new trainer weighs 3700 lbs. Span is 41 feet 5 inches, over-all length 27 feet 11 inches. Top speed is clocked at 170 mph.

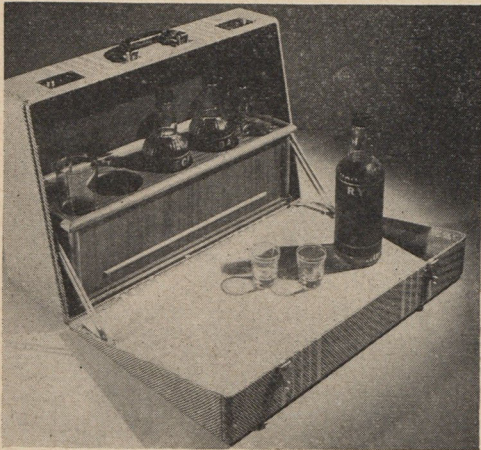
Curtiss Wright has announced the development of a four-engined cargo plane which will be built at their Columbus plant. Profiting from their experience with the C-46, the new craft will incorporate features which are designed to result in lower operating costs, greater flexibility, low ton-mile rate.

The new type, designated as the CW-32, is a high-wing monoplane, powered by four R1820 Wright Cyclone engines, equipped with turbo superchargers. This is the same proven power plant used in B-17s, which will allow operators to secure engine replacements out of the existing stock pile of this equipment.

The craft's cargo floor is at truck height, and can be reached through four large doors, two on either side of the fuselage. An optional feature is a hinged fuselage, which allows the tail to be lifted to admit bulky cargo. Capacity is 4000 cubic feet, range is 1500 miles with 25,000 pounds at 270 mph at 25,000 feet.

it's a Gift

If you are in the middle of a last minute mad scramble to complete your Christmas gift shopping list, perhaps some of the following suggestions may save the day for you. You'll find ideas for all members of your family and some that will suit your fellow AAF pals to a "T"



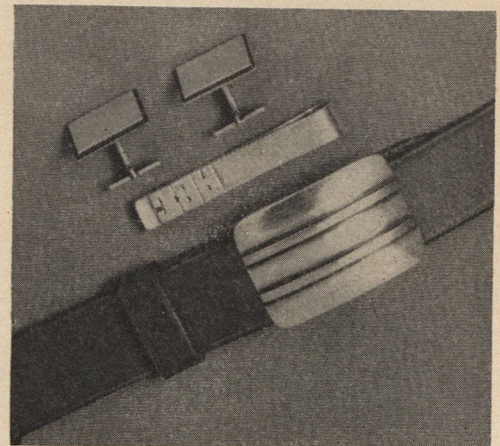
Traveling bar has everything for amateur bartender. Front panel of "airplane" suitcase drops down showing miniature mahogany bar, with 3 bottles, 4 highball glasses, stirrers and 2 jiggers. Lewis & Conger, Avenue of Americas, N. Y.



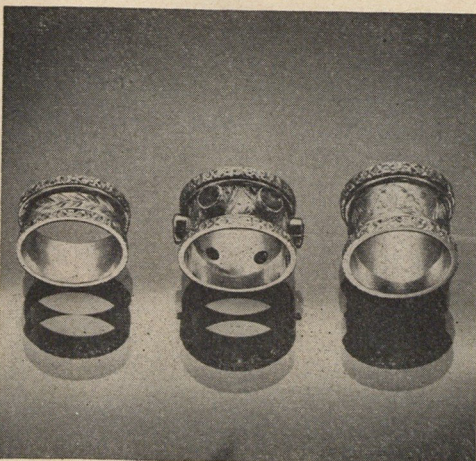
Elast-Glass golf jacket. War-tested material is supple, is easily rolled up, packed into golf bag. Full cut, plenty of arm, shoulder room to swing a golf club. Styled with zipper and flap pocket. S Buchsbaum & Co, 1737 S. Mich. Ave., Chi.



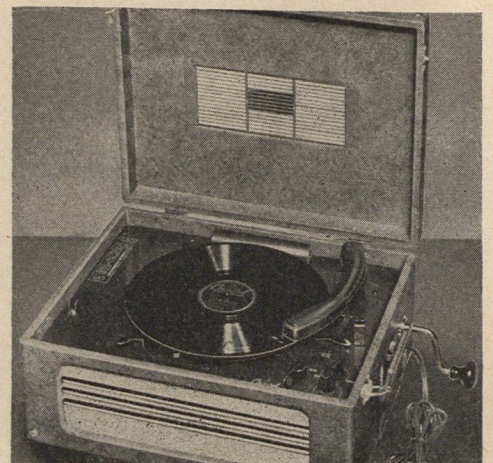
Bell Chronograph, 17-jeweled, precision-tested, shockproof, radium dial and hands, anti-magnetic, unbreakable crystal, tachometer, telemeter, stainless steel case, two pushers. Priced from \$69.75 to \$190.00. Bell Watch Co., Radio City, N. Y.



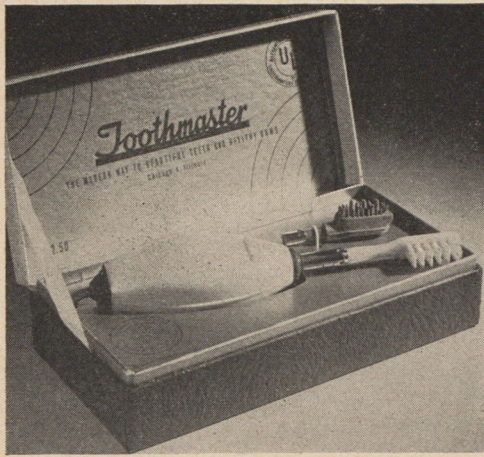
Silver belt buckle, tie clip, or cufflinks. Three handsome masculine accessories offered by Georg Jensen, 667 5th Ave. New York City. Oxidized lines enhance beauty. Buckle \$16.50; belt \$6; tie clip with carved initials \$12; cufflinks \$16.50.



Irish Wedding Ring. She'll go for charming reproductions of ancient Irish ring whether or not she's from the "ould sod." Are in various widths, priced \$55 in plain gold, \$75 and up set with birthstones. Temple's Jewels, 732 Fifth Ave., N.Y.C.



Three-way portable phonograph plays on AC, DC, own battery, has a spring wound motor and an electric motor. Fine tone. Made by Capitol Records, Inc. Stylish leatherette covering. A perfect gift for family use. Zone 1: \$84.50; Zone 2: \$89.50.

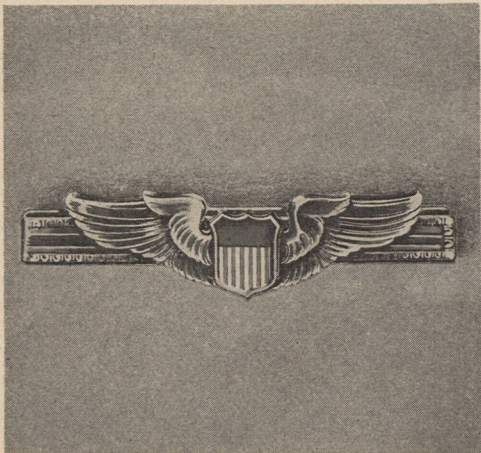


Electric tooth brush. Turn on the electricity, thousands of up-and-down vibrations every minute brush teeth, make them sparkle. Attach massager four minutes, you equal 30 minutes hand massage. Lewis & Conger, N. Y. City. For AC only. \$12.50.

Handsome pipes by Marxman, in finest briars. Wide selection in all price ranges, many are hand-carved as top pipe shown here. This is Benchmade model priced \$5 to \$10. On bottom, the Superbriar at \$5. Marxman Pipes, 27 West 24 St. N.Y.C.



Army Wings tie clip. Was made first as a custom order. Seen by other fliers, has become a popular request success. Veterans of the AAF will want it in sterling. George Schofield, 21 Maiden Lane, New York City, makes and distributes it. \$5.



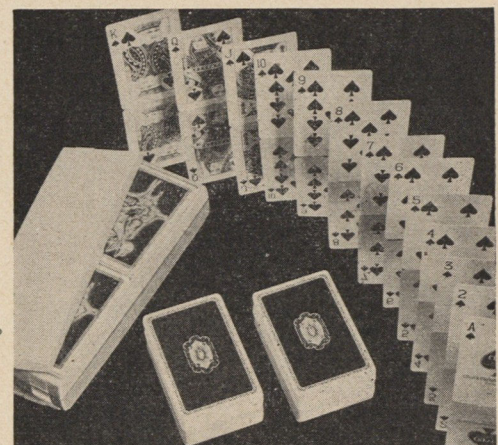
Hialeah chronograph, 17-jewel 12-hour recorder, with radium dial. Water-resistant, shock-resistant, stainless steel is used for case. One of finest high-quality chronographs on the market. Made by O. Maire, Inc., 45 Lispenard St., NYC.



Men's toiletries. Famous sets by Seaforth, now in gay, colored, heavy foil with diagonal stripes. \$5 set shown here has shaving mug, hairdress, 3 cakes men's soap, lotion, and talc. \$7 sets have containers of cologne and deodorant, too.



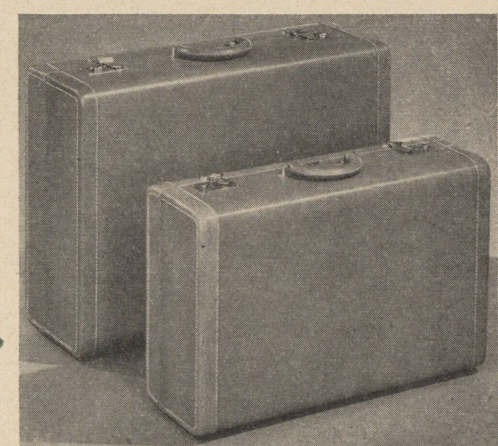
Cruver washable plastic playing cards. A perfect gift for men or women, these cards are colorfully designed, uniquely packaged. They're sturdy, and will retain their fresh feeling for a long, long time. At \$7 fortwo decks, a great gift.

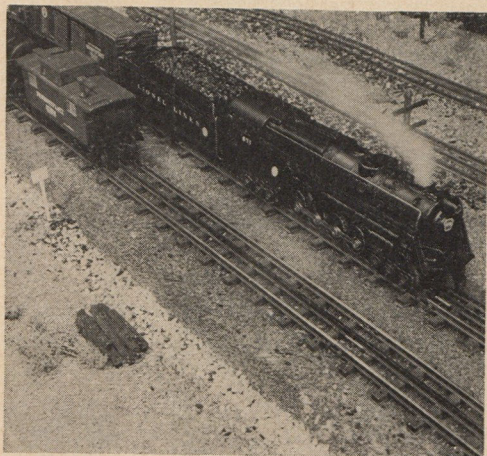


Ball point pen. New method of placing ball point resembling way precious jewels are set. Chrome steel ball is tiniest in use today, promising even flow of ink. Writes from one to five years. S. Buchsbaum & Co., S. Michigan Avenue, Chi.



Luggage is always an exciting gift as suggested by the two matched suitcases illustrated here. Made by Lido Luggage Co. of 26 West 17th Street, N.Y.C. these cases are a treat to the eye. Distinctive matched sets will win you grateful thanks.





Lionel trains—dads and sons have been waiting for them a long time. Shown here a brand-new model of the Pennsylvania Steam-turbine, with 20 wheels and puffing real smoke. There are many other thrilling sets waiting to fill your evenings.

Copper frying pan ash tray is replica of old-fashioned frying pan popular in grandma's time. Initials in contrasting metal. 6 1/2" long. \$2.25. Next to it, "Lady Elizabeth" brass table bell. \$1.75. Art Colony Industries, 69 5th Ave., NYC.



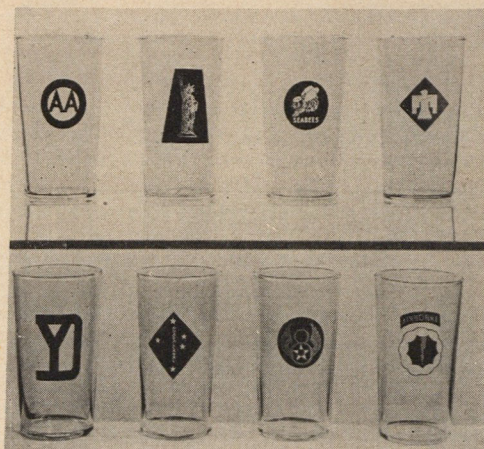
Tourneau watches presents its new chronograph. Encased with beautiful stainless steel, it is both waterproof and shock-proof. Movement is 17-jeweled in this 12-hour recorder. Tax inc.; \$100. Tourneau Watches, 431 Madison Avenue, N.Y.C.

Waxed especially for the kids are several new Capitol music and drama albums. Stories are narrated by Margaret O'Brien and other famed personalities and have exciting musical and sound effects. Complete picture book included. \$2.25 up.



Smartly hand-tailored, gloves such as these handsome, cedar colored coverings made by the Hansen Glove Corporation, of Milwaukee, Wisconsin, should delight any man holiday-time. These are style no. 1850, and they can be purchased for \$12.

Drinks take wings when served in highball glasses decorated with shoulder patches of your own outfit. Authentically reproduced in full color. Great gift for an old AAF buddy, it costs only \$5 for set of 8 at Lewis and Conger, N.Y., N.Y.



A portable golf driving range will keep you busy all winter while your favorite course is blanketed with snow. Can help you cut 10 to 20 strokes from game. A foot toward target equals 50 fairway yards. \$7.95. Par Golf Co., Canton, Ohio.



New Elasti-glass pouch offers a continual supply of tobacco which is always moist. Valve leads water between two walls where there is special layer of absorbent material. There is bulb for adding water \$1 from S. Buchsbaum & Co., Chi.



CROSS-COUNTRY

TO: ALL FORMER MEMBERS OF THE ARMY AIR FORCES—
Now that you are back in civilian clothes, renewing old friendships and picking up where you left off, we think that you might be interested to know what is going on in the AAF.

I should like you to know the activities in which the Air Forces are now participating, the needs to carry out our programs in research and development and our aims for the Air Reserve and Air National Guard. We want you to feel that you are still on THE TEAM.

That is why we are asking you to give us your name and the present address at which mail can reach you, and also to keep us up-to-date on any changes in your home address.

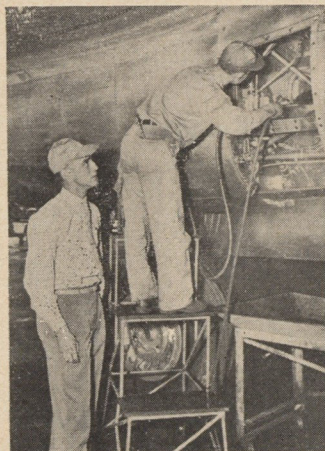
We don't want to trust our old records to send out information that we think is important to you. That is why we should like you to fill out the attached card and MAIL IT NOW

Carl Spaatz

FILL IN AND MAIL THIS CARD TODAY ! !
Please PRINT all information.

(Army serial number) _____
Name _____ (First) _____ (Middle initial) _____ (Last) _____
Home Address _____ (Street number and name) _____ (State) _____
(City) _____ (Postal zone number) _____
I am a member of the: ☐ Enlisted Reserve ² ☐ National Guard ³
(Check appropriate space above)
I am not a member but would like information about the: ☐ Enlisted Reserve ⁴ ☐ National Guard ⁶
(Check appropriate space above)

Operation Roger is the AAF's plan to obtain names and addresses of all ex-Air Force members. Cards like one above were distributed by CAP and Boy Scouts beginning Nov. 23. Below left: co-pilot W. Button looks on as Southwest Airmotive mechanic at Dallas cleans engine of Jimmy Doolittle's plane during general's visit to CAP-AAF show. Center: men of "world's loneliest outpost" who were marooned in Greenland. Right: Miss Jean-Marie Baumer, Colonial stewardess, who was recently chosen the "Smile Girl of the Air."



Happy Note for Chowhounds

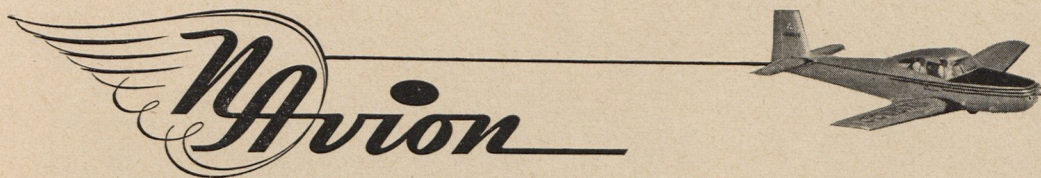
The Army has at last officially recognized the fact that the "attractiveness" of the food it serves in GI mess halls could be improved upon. In a document called "Report of Army Food Services Activities" made by the Hennessey Board, it is stated that the food purchased for Army use is "good quality, standard merchandise of the type normally used by American people of moderate means." But the Air Quartermaster says that buying good food isn't enough. It must be served well, too. "Because of competition and the profit incentive," he says, "civilian establishments undoubtedly offer food that is more attractive than that served in many Army dining halls." So he has authorized an experimental training program wherein AAF cooks will get "on-the-job training" with leading hotels and restaurants. The program has already begun in New York, where Mitchel Field cooks are now dabbling in the soup at some of Park Avenue's best hosteleries. If it's a success there, the project will be adopted nationally. The National Restaurant Association, the American Hotel Association, American Bakers Association, and American Warehousemen's Association have volunteered to "assist in the improvement of Army food."

The Air Reserve

More than 20,000 former Army Air Forces pilots, all vets of World War II, have enrolled for inactive duty training under the AAF's new Air Reserve Training Program, and nearly 7,000 of them already have qualified for training and begun flying.

The Air Reserve program is designed to train 22,500 pilots, 27,500 non-rated officers, and 120,000 enlisted men. Training of the Reserve is to be carried on at more than 100 special Air Reserve bases located throughout the country. As of October 27, sixty Air Reserve bases had been established in 34 states. Organization of the entire program will be completed by July 1, 1947. In an early issue AIR FORCE will

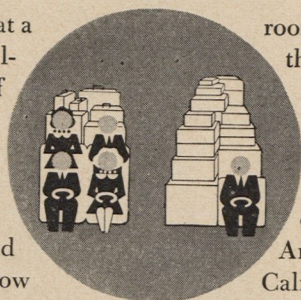
(Continued on page 59)



HAS ROOM TO SPARE

Carries 4 people and luggage or pilot and 645 lbs. of cargo

Built for comfortable 500-mile flights at a high cruising speed, the four-place, all-metal *Navion* can carry a useful load of over half a ton. The baggage shown in the picture below fits easily in the *Navion's* spacious trunk compartment. Glove and map compartments and a wide shelf provide additional space and the *Navion* has plenty of leg and elbow



room for four big people. By removing the rear seat, two persons can fly with 455 pounds of cargo. The pilot alone can carry 645 pounds in the 55 cubic foot cargo space. For further details about the *Navion's* utility for business or pleasure... write Dept. C-7, North American Aviation, Inc., Los Angeles 45, California. Standard model, \$6,100 f.a.f.

CAA Approved Type Certificate 782



BUY
CHRISTMAS
SEALS

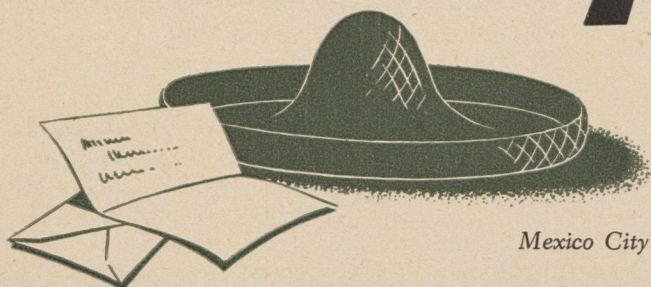
Designed and built by

NORTH AMERICAN AVIATION INC.



The Navion is built by the creators of the famous P-51 Mustang, P-82 Twin Mustang, XFJ-1 Navy jet fighter, P-86 Army jet fighter, B-45 Army jet bomber and other advanced-type aircraft

LETTER FROM MEXICO



Mexico City

THE Mexican Air Force will seek in the near future to buy jet propulsion planes in the United States and to have pilots specially trained in handling that type of aircraft, according to General of Brigade Gustavo Salinas Camiña, Mexico's Director of Military Aviation.

General Salinas reveals that the Mexican Air Force wants to acquire newer type planes, with a view to keeping its personnel up to date on advances in aviation. In discussing Mexico's postwar military aviation program, the Mexican Air Force chief says this program includes detailed plans for modernizing and expanding current equipment and training facilities, so that the Mexican Air Force will be ready for any duty assigned to it in defense of the republic and of the hemisphere as a whole.

Plainly, General Salinas intends that his country shall lead Latin America in the field of military aviation—a position to which he feels Mexico is historically entitled, both by reason of her pioneer activities in the air and of her more recent contribution to the winning of World War II. "The future rôle of Mexican military aviation," General Salinas told *AIR FORCE's* correspondent, "will depend upon the position it occupies in our own national defense picture as well as in continental defense councils."

Internally, General Salinas said, present developments are tending towards creation of an autonomous Mexican Air Force, for which organizational and administrative plans are already being drafted. There appears to be enthusiastic support for the project in all ranks of Mexican military aviation, both active and reserve.

General Salinas, a nephew of Mexico's famed revolutionary President Venustiano Carranza, was himself one of the Hemisphere's pioneers in military aviation. Back in 1912, he was among the original group of Mexican flyers to be sent to the United States for training. In 1914, holding the rank of captain, he participated in the bombing of Huertista troops and vessels in the harbor of Topolobampo, near Mazatlan, Mexico—the first recorded instance in the Americas of aerial bombing of a military objective, second in the entire world.

Today, as Director of Military Aviation, General Salinas holds a position in Mexico comparable to that of General Carl Spaatz in the United States. Together with other steadfast members of Mexico's original group of military flyers—which included his cousin, General Alberto Salinas Carranza, now heading the Mexican Air Mission in Washington—he has devoted a lifetime to building aviation in the service of his country. His sincerity and his energy are evident.

Mexican Flyers in World War II

He is intensely proud of the part his boys of Fighter Squadron 201 played last year in strafing Japs up and down the Philippines, and in flying overwater fighter missions in their P-47 Thunderbolts. This squadron, after completing advanced training in the United States, was attached to Allied forces in the Pacific. After supporting Allied ground troops and guerrillas all the way up the Philippines, it was sent on to northern Luzon.

BY R. L. MARTIN, *Air Force Staff Correspondent*

Other services rendered by the Mexican Air Force in World War II are listed by General Salinas as follows: a) patrol of the territory and seacoasts of the Mexican Republic and its detached dependencies, constituting a continual service for the duration of the war; b) patrol of the sea lanes in Mexican territorial waters, in order to warn native and foreign shipping against possible attacks from enemy submarines. In short, the wartime Mexican Air Force guarded a vital overland route to the Panama Canal and aided U.S., British and Mexican naval forces in checking the submarine menace.

At the close of hostilities—according to figures authorized by General Salinas for publication in *AIR FORCE*—Mexico had some 250 military airplanes, which have since been increased to 300. The principal types are: (training) North American AT-6, Fairchild PT-19, Vultee BT-13, Beechcraft AT-11, AT-7 and F-2; (combat) Republic P-47, Douglas A-24, North American B-25; (transport) Douglas C-47, Lockheed C-60; (liaison) Stinson L-5-E; and several other types. Most of this equipment was obtained from the United States under lend-lease, but present U.S. law requires that further purchases be made on the basis of cash or commercial credit. In view of the firm condition of the Mexican Treasury today, some foreign observers believe that Mexico may possibly prefer to pay cash on the line for the new planes contemplated in her postwar procurement program.

Mexico had some 200 military pilots when the war ended, and today has about 300. Of these, 60% received special training in the United States, where advanced training in medium bombers and fighters as well as in piloting parachutists is still being offered to Mexican Air Force pilots on completion of their general course at the Mexican School of Military Aviation. Mexico's military aviation school, which was founded in 1915, now graduates 50 pilots annually, but General Salinas predicts its capacity will be increased during the coming year.



Two pioneers in U.S. aviation entertain two of Mexico's top air personalities in Dayton in 1927. Major Jimmy Doolittle is at left, flanked by Major A. Maria Zuloaga, first man to fly the Andes, Orville Wright, Juan-Guillermo Villasana, Civil Aviation director.

As early as 1908 a group of Mexican Army lads—Juan Pablo and Eduardo Aldasoro, Henrique Alvarez, Daniel Garcia, Pablo Lozano, Horacio Ruiz Gavino and a certain Colonel Joe O'Kelley—designed and built a glider at the Mines of Dos Estrellas. A few years later they succeeded in achieving powered flight.

This little band of enthusiasts, which also included the Salinas cousins and Juan Guillermo Villasana, was among the first to make flying a reality in Mexico. Horacio Ruiz Gavino, today a Colonel in the Mexican Air Force, became the first aviation instructor in Mexico, and on July 6, 1917 also flew the first Mexican air mail from Mexico City to Pachuca—antedating by almost a year the first official air-mail flight in the United States, which occurred on May 15, 1918.

During the Mexican Revolution, military aviation proved its value by flying attack, observation and bomber missions, not only in the central states but as far away as the Yucatan peninsula. In recognition of these services, the chief of the Constitutionalist armies, Don Venustiano Carranza, issued the decree of Feb. 6, 1915 creating the Mexican Air Force.

A year later the Carranza Government was also operating a well-equipped military aircraft plant. There Mexican engineers and Mexican workmen turned out planes, helicopters and motors, as well as the few simple navigation instruments used in those days. By 1920 this plant had produced a total of 170 airplane motors, filling the needs of the Mexican Air Force and demonstrating a production capacity far in advance of any other Latin-American contemporary.

From aviation's start down through the era of long-distance flights which preceded World War II, using first native and later foreign-built planes obtained in Europe and the United

States, Mexican military aviation has been considered outstanding in Latin America. National pride and the memory of national achievements, plus the recognition of hemispheric responsibilities in this atomic age, once more impel Mexico to take the lead among Latin American nations in the field of military aviation, General Salinas revealed.

First Helicopter Run

In the field of commercial aviation Mexico has just scooped the air world by licensing routes for the first commercial helicopter line in any country, according to Ingeniero Juan Guillermo Villasana, Mexican Director of Civil Aviation.

The new company, known as Helicopteros de Mexico S.A., will begin operations as soon as its president, William Mallory, can secure delivery from the United States of the latest type multi-passenger helicopters to be released for commercial use. It will operate in the vicinity of Mexico City, Guadalajara, Oaxaca, San Cristobal, Durango, Hermosillo and Chihuahua, serving a radius of 200 kilometers in each zone and transporting passengers between outlying points and the city airports, Villasana said.

It is believed the service will prove especially useful in Mexico's mountainous terrain, where highways are scarce and few suitable landing spots exist for conventional-type airplanes. By taking the initiative in this hitherto untried branch of commercial aviation, Mexico reaffirms its aim to be first among Central and South American nations in the air—an aim, Ingeniero Villasana asserts, that can be traced back as far as the Aztec rulers of pre-Spanish Mexico who had a religious ceremony anticipating human flight.

A firm believer in Mexico's aerial destiny, Villasana cites past history and current statistics, while outlining broad plans for the future. Of future prospects which he disclosed to AIR FORCE, two were particularly outstanding:

1) a pending concession to a private company for modernizing Mexico City's commercial airport at a proposed cost of 30 million pesos (over \$6,000,000), which may give Mexico the most up-to-date municipal airport in Latin America;

2) eventual plans for the revival of aircraft manufacture in Mexico, in cooperation with United States plane-builders.

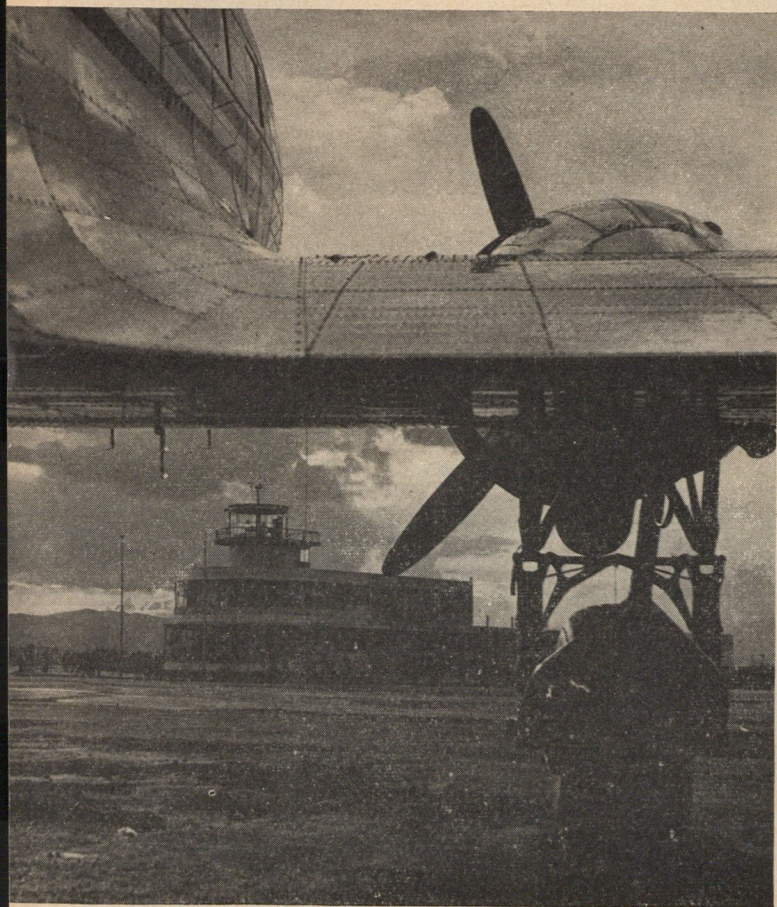
Ingeniero Villasana received AIR FORCE's correspondent in the inner office from which he guides all phases of civil aviation in Mexico. It was a tiny, windowless cubicle, just large enough to contain the big desk and the small, dark-haired man of fifty or so behind it—a man, evidently, who cares little for personal comfort but is intensely interested in his work. The time was twenty minutes after one on a Saturday, and work in the Ministry of Communications stopped promptly at one-thirty. Yet Villasana stayed nearly an hour longer, talking informatively about the one subject which has absorbed him since boyhood: the progress of aviation in Mexico.

As a lad of 13, Juan Guillermo Villasana ran across a pencilled manuscript in his father's library, the first book on aeronautics ever written in Mexico. From that day, he made up his mind to become a flyer. With a group of other Mexican boys he taught himself to fly, and he was allowed to pilot the first plane ever built in Mexico.

Like his present-day military counterpart, General Salinas, Villasana was among the original Mexican flyers to be sent to the United States for training in 1912. In 1917 he took a degree in aeronautical engineering at Buffalo, N. Y. In 1920, holding the Army rank of captain, he headed the five-year-old Mexican School of Military Aviation.

Since its founding in 1928 he has directed Mexico's Department of Civil Aviation, handling an ever-increasing number of technical, legal, administrative and economic problems which today affect an airlines network covering 53 routes and serving 210 towns and cities in Mexico. Many of the present Air Force leaders in Mexico were once his students at the School of Military Aviation, and they value his sincerity as

Mexico's civilian airports will undergo considerable revamping if present plans of General Salinas Villasana, chief of the Dept. of Civil Aviation, mature. Rates to airlines will not be exorbitant.



well as his technical qualifications. Since he also happens to have been born in Vera Cruz, the home state of President Elect Miguel Aleman, it is a reasonably safe guess that Villasana will continue to head a department which combines the multiple functions of CAA and CAB in the U. S.

Facilities Expanded

"Aviation," he said, "has already opened up many once inaccessible sections of Mexico. The war gave impetus to this development, particularly in the field of air cargo and industrial service. During the war our airlines did an important job of carrying vital materials from otherwise remote sources of supply, chicle from the southern jungles and strategic minerals from the northern mines. Today, in addition to its public carriers, Mexico has 12 industrial airlines which serve specific industries.

"Passenger facilities, for tourists and others, are being expanded as rapidly as possible; but the biggest field for expansion is still the air cargo line. Cargo flights from the United States, both scheduled and unscheduled, bring us a certain amount of vitally needed merchandise, yet a great deal remains to be done in that respect.

"Internally, our air cargo carriers are promoting trade and commerce between widely separated parts of the country. For example, any number of good shrimp and oyster bars have recently sprung up in Mexico City. Where a few years ago seafood in the capital was a somewhat dangerous delicacy, fresh supplies are now being carried daily by air from the coast."

"There is a tremendous field for commercial aviation in Mexico," Villasana said. "The biggest need today is for suitable equipment and for more and better airports."

Believing that increasing numbers of short-haul planes will become available within the next few years, he said his department will soon undertake to draft a general plan for feeder line routes throughout Mexico. Along the northern border such lines will probably connect with GI-operated feeder lines in U.S. border states. Properly speaking, he said, Mexico has no feeder lines at present, but only small trunk lines joining main trunk lines.

As to airfields, Villasana foresees a considerable development by private companies which will be organized solely for construction and maintenance of public airports in Mexico. He believes an airport can and should be a paying concern, without exorbitant service charges to the airlines. The pending concession for revamping Mexico City's airport, expected to become official in a matter of months, may prove to be only the first in a series of similar enterprises.

Villasana said that Mexico's aviation law of 1939 permits airports to be constructed either by private companies for public use or by direct Government grant. To date, the only major commercial airport to have been completed under Government grant is the new field at Acapulco, now a thriving west coast tourist center.

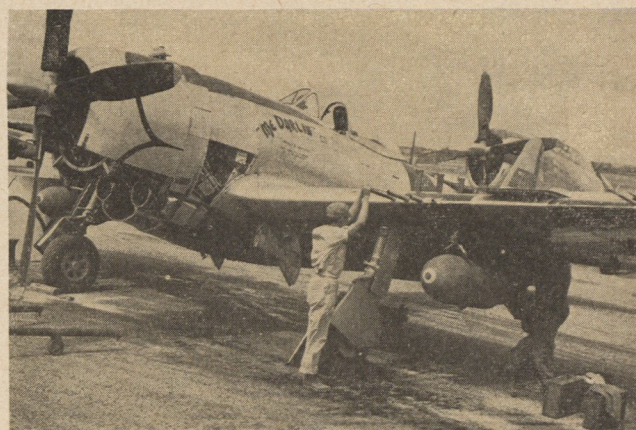
Villasana predicts that in the visible future Mexicans will build airplanes again, as they did before 1921. The first step, he said, will be the fabrication of spare parts, leading eventually to the assembly of entire airframes and motors. He pointed out that training and manufacturing methods, evolved when thousands of unskilled workers were brought into wartime aircraft plants in the United States, can be profitably applied in Mexico where land and labor costs are favorable. Moreover, he added, it might prove convenient for the U.S. aircraft industry to develop a manufacturing and sales center in near-by, Spanish-speaking Mexico, for general distribution of airplanes and parts in Central and South America. On grounds of sentiment as well as geography, Villasana feels Mexico is well suited to become the standard-bearer of aviation in Latin America.



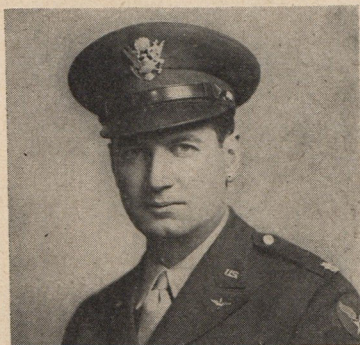
Lt. Amadeo Castro and Lt. R. Urias, both of Mexico's 201st Fighter Squadron, exchange victory smiles after having dropped their bombs on a Jap target during the Sqdn's first combat mission overseas.



Some of the 201st's fighter pilots pose in front of their ships at Clark Field, Luzon, P. I. Mexicans had enviable record during the war, concentrated their efforts on supporting ground troops.



A member of the 201st's ground crew cleans a .50 caliber machine gun on the P-47 Thunderbolt "Me Darlin" after a mission from the Philippines in June of 1945. Mexican A.F. now has about 300 planes.



Col. L. P. Weicker, AFA director and president of Squibb & Sons began Army career in '42.



You'd never guess it to look at this picture, but this is Lieutenant H. H. Arnold ten ranks removed from the five-star rank he held at retirement.



Captain Ira Eaker and Lt. Muir Fairchild, later promoted to Lt. and Maj. Gens. respectively, after return from South American goodwill hop.

General F. P. Lahm—then Captain—was one of the first two Army men to fly.



AFAer L. H. Brereton (left) and Billy Mitchell, Germany after World War II.

AFA

FAMILY ALBUM

AS YOU WERE—That's how we would like to see you in this new Air Force feature. So if you have any pictures of yourself like these, won't you please send them along?

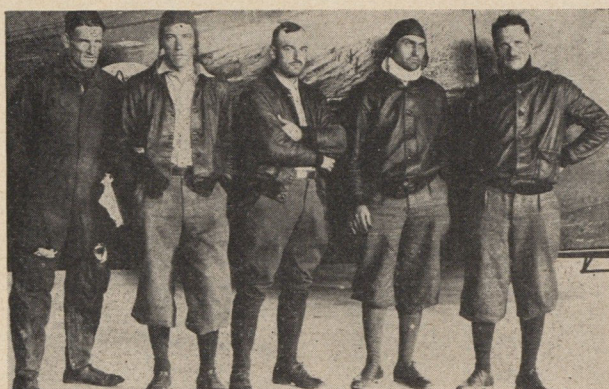




AFA Executive Director Col. Willis Fitch as an Aviation Cadet in Italy in 1917.

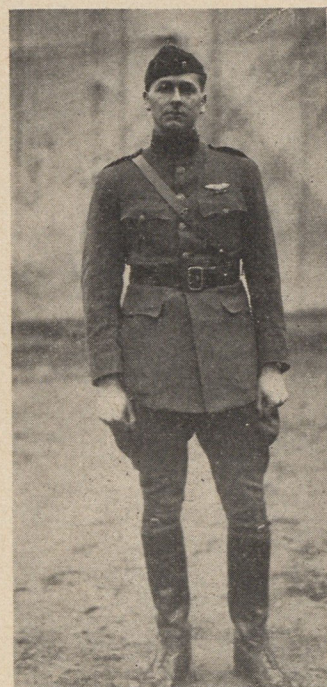


The "Old Man," General Carl Spaatz, who was then a Major, poses in front of Army Air Forces plane in the late twenties. Spaatz is associate AFAer.

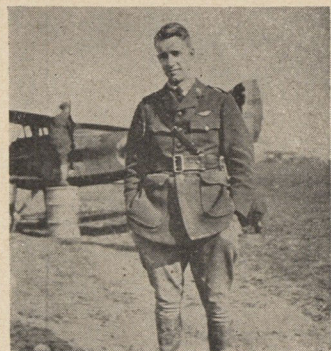


The Crew of the Question Mark which established an endurance record of 150 hrs. 40 min. over Los Angeles in 1929. From left: Sgt. Hooe, Lt. E. R. Quesada, Lt. Halverson, Capt. Eaker and Maj. Spaatz. Quesada, Eaker and Spaatz are AFAers. Below, AFA president James H. Doolittle.

Colonel Everett Cook, AFA director, was World War I 91st Aero Sq. captain.



AFA's first Vice President, General Ted Curtis, as he looked in first World War.



FLYING TIME

A study of the personal aviation timepiece and its relation to the aircrew and to flying, by a member of the research staff of the famed Academy of Time

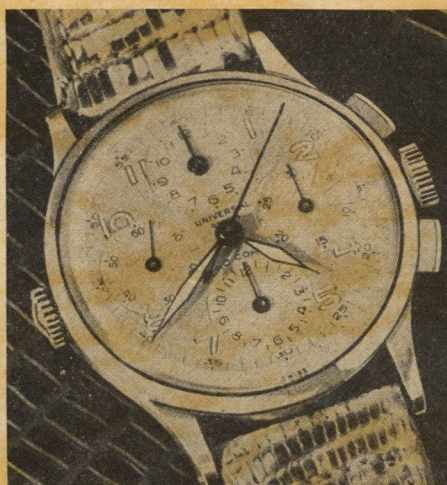
ORVILLE WRIGHT on his first flight was aloft for twelve seconds and at a speed of 3.068 miles per hour covered one hundred and twenty feet. Today's jet plane can do the same distance in roughly .0666 seconds. But that speed, while indicative of the progress made by aviation, presents complications in aerial navigation. Accurate timekeeping on the part of the pilot or navigator is essential. As the speed rises, the bearings and fixes given a plane by direction finding stations decrease in accuracy, and by the time that particular bearing or fix is passed on to the pilot, the plane can have travelled some miles along, on course or off. Even Loran fixes are subject to a certain amount of error. Certainly the shootings of a navigator of the sun or stars are not going to be overly accurate when the current and future speeds of planes are taken into consideration. When a flight is being made under C.F.R., this is not too serious a matter, but under I.F.R., timing must be accurate if the correct action is going to be taken at the right time. On a long overwater flight, such as the 2,408-mile hop to Hawaii (Hickam Field), the exact time that the pilot should let down must be followed, lest the island be overshot.

An accurate timepiece is therefore essential. During World War II every pilot had as issue the "hack" watch, a sturdy and not too expensive timepiece. For the thousands of pilots it did the job with the help of the standard instrument panel eight-day windup clock. Most American commercial airlines, however, furnish their pilots with a finer, more accurate

wrist watch, commonly called a chronograph. Resembling a wrist stop watch, the chronograph is actually more than that. A chronograph, besides telling the time of day, has a number of other things to offer the pilot. But some chronographs are supercomplicated. A wide variety was picked up by Americans on leave in Switzerland. These include watches showing the time of day, day of the week and of the month, and the phase of the moon. Most of these added features are of little or no use to the pilot unless he becomes a Robinson Crusoe. They only clutter up the dial of the watch and make it harder to read, as well as making it much more difficult to service. But the essentials of a chronograph—a standard dial, a split-second hand, and an elapsed time dial—should be incorporated in a pilot's watch. The split-second hand is very useful, especially when used in connection with the elapsed time dials. Many pilots use this to check their distance from stations in conjunction with their radio compass. By flying a course with the station at a 90° angle off the wingtip, and then keeping the same heading, the distance from the station can be computed from the formula:

$$\text{Distance} = \frac{\text{Ground Speed} \times \text{Time}}{\text{Angle of Change}}$$

This requires, of course, split second timing, as do most instrument letdowns. Pilots have from time immemorial let down on a range in a standard letdown, using the dashboard clock or a sweep second hand alone, only to forget how many



Former AAFer R. F. Boetger checks his chronograph before taking off at Teterboro. Good aviation timepieces vary little in external appearance, as shown by the Universal Geneva Aero-Compax and Benrus's widely used Sky-Chief.



minutes they have been flying on the outbound leg. With a chronograph's elapsed time dial, this mistake cannot occur.

No longer can the plane almost run into a gas tank near the field, nor into a mountain that might be the extra minute's flight out. But these are for overland. Overwater flights are another problem, and there the elapsed time dials are important. Often chronographs have only one elapsed time dial, reading up to thirty minutes. On long overwater flights, where the time of letdown through any overcast is important, the pilot is able to press a knob and let the time tick on. For this, the half-hour dial is needed, but also a twelve-hour added dial. In aerial navigation of the future, the pilot will more and more be dependent upon outside aids, each of which depends on timing. Watches today should be accurate to reduce pilot error. Loran on a large scale could obviate the necessity for many pilot calculations in which he is now dependent upon a watch. Whereas today he must check his elapsed time against an ETA to figure his location, Loran can take him from point to point with even greater ease than radio ranges which are subject to bends and multiple courses no matter how accurately the "dog houses" are tuned. But today a total elapsed time is needed, and given in a chronograph which has two dials—one for periods up to 30 minutes, the other for half hours up to 12 hours. This cuts down the paper work the pilot must do. In between, the pilot may use elapsed time dials for estimating checkpoints.

Although the Army Air Forces employed various "blind landing" and approach control electronic devices, owing to widespread hope for a foolproof method involving as little aid from non-flying personnel as possible, there has been no widely adopted method for instrument landings. As a result, the pilot today in several variations on the theme is forced to time accurately his pattern in order that he may avoid other planes in the pattern and eventually land his ship safely. If he is making an approach off a radio range and assuming planes are stacked up for a few thousand feet, he must time his flight back and forth on whatever leg is used for the purpose, and he must be careful not to overfly the course, else he is liable to impinge on the pattern of a near-by field or hit something. He drops down from level to level until he

is number one to land. Then out on the last leg over the high cone, procedure turn, and down over the low one. All this must be timed exactly so that a steady rhythm can be maintained and the fastest possible landings made. Approach control operators, tower operators, and the pilots must coordinate their actions and that means accurate timing, with the split-second dial and the 30-minute elapsed time dial.

The mechanics of watchmaking have not changed in a century. Basically a wrist watch is based on the controlled release of tension of the mainspring. This is accomplished by a train of interlocking wheels ending with a balance wheel and escapement lever. A chronograph, through additional levers, springs, and wheels, accomplishes the desired end results; namely, interrupted elapsed time readings.

What makes a "good" or "bad" watch is the finesse with which the parts are made and the stability of operation of the mechanism. Today's machines are able to make watch parts to 10,000ths of an inch. Holes for pivots must be accurate in location and the weight of each screw in the balance wheel must be equally exact.

The majority of watches have an escapement based on a hairspring that vibrates at 18,000 pulsations per hour, which is five ticks per second. Some watches have been made with four ticks per second, but the higher number reduces the interference of action movements of the arm on the movement of the watch. Other watches are based on the theory of Breguet, which specifies 22,000 vibrations per hour, or approximately six ticks per second. This theoretically is a refinement of the above principle to insure further that the arm movement will not interfere with the watch, but the vast majority of manufacturers stick to the 18,000 vibration base because it has not been proven to watchmakers that there is any improvement with the higher figure. Also to be considered in the balance wheel is the weight, although not the size. For the same reason as above, a heavy balance wheel is preferred. Inasmuch as the center of gravity of the watch does not enter into the problem, the location of the balance wheel is not important. Another designer, Tourbillon, however, has designed an escapement that travels with the balance wheel. This free moving escapement is expensive and has only been made experimentally by hand,



The 17-jewel Tourneau chronograph has the typical 12-hour recorder, and is cased in waterproof stainless steel.

but achieves the object of making the watch unaffected by the position in which it is carried or worn.

Jewels in a watch movement help insure the stability of the timekeeping ability of the watch. By means of jewels, the friction resistance of the gear train is reduced. Therefore, most chronographs are jewelled watches. But as in most everything else, there is a point of diminishing returns, after which added jewels are of no value. The added jewels are often haphazardly placed in the design of the watch merely to increase the selling value of the item, without improving the timekeeping ability of the watch. A seventeen-jewel watch is adequate to the needs of even a pilot or navigator.

But the cleanliness of the watch is important also. It is incredible how much foreign matter can enter a watch case, no matter how tightly that case may fit. Watches have been returned after having been in an aircraft crash that were packed with grit, although the case had remained intact through the crash. Similarly a certain amount of dust will filter into a case almost as if by osmosis. If allowed to accumulate over a long period, the frictionless qualities of the oil will disappear and the watch will run erratically. Moral of the story is that a cleaning of the watch every six months to a year will do much to keep the watch in its original condition.

A word is in order when discussing the care of a watch about winding it. This is connected with the regulation of the watch by the manufacturer and jeweler. Watches are designed with a mainspring that will run for perhaps thirty-six hours. As the tension of the spring becomes less, the watch will run more slowly. And at the same time, there is a "characteristic curve" associated with the release of tension. Manufacturers have taken the flat part of the curve to fix the working of the watch. This flat part has a spread of approximately twenty-four hours. The midpoint on this part of the curve is picked as the normal point of the curve for the regulation of the watch. Therefore, a watch should be wound once a day, and at the same time each day. This will stabilize the easing of the tension over the normal period for which the watch has been designed and regulated. The difference in speed of the watch over this curve is negligible, and if the whole section of the curve is used as designed, the watch will, over a period of months, be more accurate.

Many watches today have shock-resisting characteristics. It should not be interpreted that this feature insures the life of the movement of the watch from all sorts of beatings that it might encounter. No watch will remain running if it is dropped from a high level. One may, now and then, just as



Kelbert's 18-jewel chronograph carries typical set-up. Watertight and anti-magnetic, it has 12-hour and 30-minute recording features.

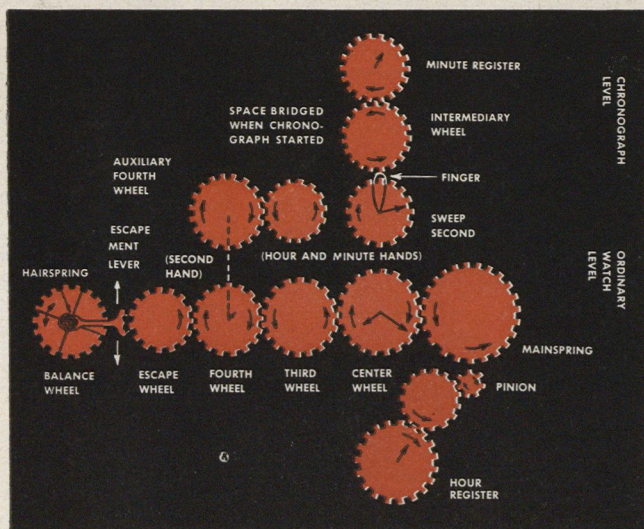
there are occasionally stories in the newspapers about people who fall out of six-story windows and live. But it is the exception and not the rule. On the other hand, there have been developed a few methods of making a watch movement more impervious to the daily jolts and jars that an active person gives to a watch. And a pilot, in that he often acts and moves quickly and is thus liable to place a greater strain on the watch, should have a chronograph with a "shock-resisting" movement.

A fallacy that might be worth mentioning is the complaint of many people that their pulse interferes with the running of the watch. The movement, being entirely enclosed in the metal case, cannot be affected by the pulse in the slightest.

During the war, although many developments in micro-second timing were made in radar and similar devices, there were no changes in the watchmaking art. The same movement is used and it accomplishes the same ends. But studies are being made constantly. New impetus has been lent by The Academy of Time, set up by the Benrus Watch Company, Inc., which numbers among its trustees General Carl Spaatz—Commander in Chief of the Army Air Forces. Of the students studying time, a few are working on problems which can affect the aircrew member's watch in the future. One of these is the effect of magnets on watches. Although some watches are highly resistant to magnetism, a completely non-magnetic watch is not available. The hairspring, if made of inferior but more magnetic resistant metal, will adversely affect the timekeeping ability of the watch. In an airplane with numerous generators, the magnetic field on the watch is considerable. The lines of force on the metal in the watch therefore produce a certain magnetized effect, which perhaps can be reduced.

Navigators too require their timepieces to be accurate and for them also a chronograph is essential. Another of Admiral Sallada's suggestions for study involved some sort of automatic clock which would readjust itself if the slightest bit off time signals as broadcast by the various standard time signal observatories, such as the United States Bureau of Standards (WWV), United States Naval Observatory Time, and the British Broadcasting System. This, however, is just another task for study on The Academy of Time agenda. For the present, navigators will have to use an accurate chronograph and check the setting with the tower before each flight. It might be noted that the tower clocks are just as accurate as those in the AACS radio room. The radio room keeps a check of their clock and the tower and other AACS facilities make frequent checks with the radio room.

The problem of an adequate timepiece for use in aviation is, therefore, being looked into with surprising intensity, despite the fact that there is currently the highly accurate, rugged chronograph. A well made timepiece of this sort, with sweep second hand, 30-minute and 12-hour registers, and a radium dial for night use, but omitting the many extras which provide nothing but trouble, with proper care will provide the pilot (or navigator) with years of service in all situations in the air.



There are about 200 parts in a chronograph watch. The diagram shows its general operation. Because they are built to perform generally the same tasks, most aviation watches keep a family resemblance. Differences are in the precision with which they are built.

HAPPY LANDINGS, Inc.



The war isn't over for 13,000 men and women of the AACS. They are still fighting to keep casualties along the airways of the AAF at a minimum—and they are doing a good job

BY PVT. STANLEY COLBERT, *Hq. AACS.*

THE war isn't over for the Airways and Air Communications service of the Army Air Forces. Their personal war, the battle of 12,800 men and women against air casualties, began in 1938 when the organization was activated on paper, and has extended since that time to an arm of the Air Force covering more than 165,000 miles of AAF airways, with 318 stations scattered all over the globe.

Every fifteen minutes, a military plane takes off from a west coast airport for a flight across the Pacific—every thirteen minutes an Army cargo or passenger plane heads out to sea

toward England and Europe. At a Forth Worth training field, control tower operators have logged seven hundred landings and take-offs per day.

Radio communications and navigational aids operated and maintained by AACS furnish the electronic nerve system and airway markers of this global, intercontinental air traffic. Every day more than 6,000,000 five-letter word groups are filed over the AACS point-to-point circuits. If each word of this traffic were cut on ticker tapes, 1400 miles of tape would be used daily. Yet outside of the airmen who place their lives

Assigned mission of AACS is to operate such navigational aids as will make possible the safe conduct of world-girdling military aircraft from point of take-off to destination.



HAPPY LANDINGS INC.

in the hands of AACS personnel from the time they climb into their ship until they have landed safely at their destination, few people know of the Airways and Air Communications Service—what it has done, and what it is doing.

Today newspapers are carrying stories of Air Force aircraft shattering speed records, and accomplishing long-distance non-stop flights that once were thought impossible. The fact is that, without the service of AACS, these flights would still be impossible.

What does AACS do? Briefly, they maintain the control tower to handle local traffic, times of departure, and landing times and local weather advice; they operate a high-frequency radio station to maintain contact with all planes flying between it and all stations north, south, east, and west; they control a radio beam which is constant between it and surrounding stations; they supervise a homing transmitter to guide lost or wandering aircraft and operate special blind-landing equipment. Multiply this by 318 stations, and you get an idea of the work done by these policemen of the air.

If all the main AACS route navigational aids—the radio ranges and homing beacons—were to be installed at an equal distance around the Equator, an airplane flying this 25,000-mile course would pass over a range or beacon transmitter every 80 miles. Still, the AACS is so little known, even in the Army, that when Capt. Raymond Chamberlain stepped down to the docks of Calcutta, India to claim some crated radios, the officer in charge of the docks pointed to the AACS stencil and said, "That's not for you. It's for the Antiaircraft China Station. See?"

During combat, AACS men were often required to set up stations while the actual fighting was going on. In fact, at Munda, twelve AACS men landed with the first wave of Marines and, while Jap rifle bullets sang by their ears, rigged up their towers, set up their sets, and eight hours later sent out their first message.

The control tower, brains of an airstrip, may be durable and well-constructed, like the one at AACS headquarters at

Langley Field, Virginia, or may resemble the crude shack on stilts that was the first tower set up on Guadalcanal. Here cards are kept on every flight that originates or terminates from that base, so that at no time does the pilot run his own plane without the help of his third hand. Sometimes the pilot bridle at ground control. Like the time the tower operator said, "If you can hear me, rock your wings."

"Roger," growled the pilot, "and if you can hear me, rock your tower."

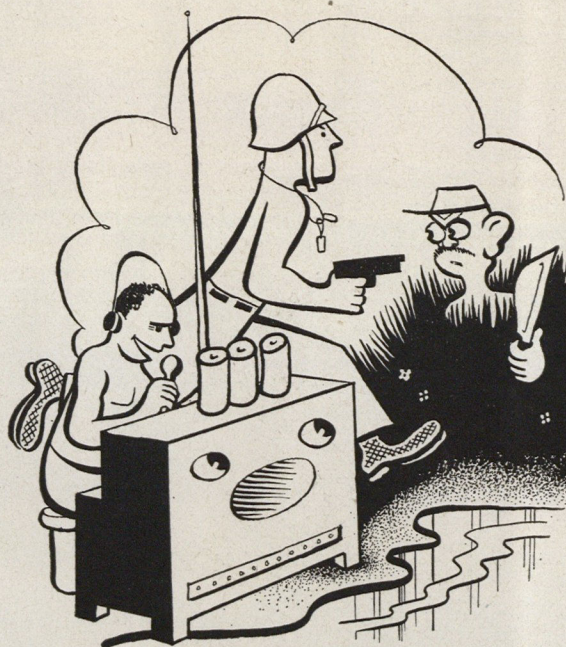
Headquarters, or "CONAS" of the Airways and Air Communications Service, is located at Langley Field, Virginia. Here Major General Harold M. McClelland and his staff direct the work that girdles the globe, crossing four oceans with installations in almost every foreign country, besides blanketing the continental United States. Here, comprehensive files are kept on every activity of the AACS from its inception until the present time.

The function of AACS, since its beginning, is to operate and maintain communications and navigational aids along the AAF supply routes and, by this service, make possible the safe-conduct of military aircraft from point of take-off to destination. Today, low and medium frequency radio transmitters, radio-teletype and automatic sending and receiving systems and landline teletype facilities provide almost all of the heavy traffic point-to-point communications channels. Communications handled by these systems include all airway weather traffic, arrival and departure notices, loading reports, operational schedules, and other messages pertinent to the business of airway operation.

Radiotelephone and CW (carrier wave) sending and receiving installations are used for air-to-ground and airdrome control tower communications. Airport control tower operators issue landing and take-off instructions to pilots, control and movement of airplanes on the ground and maintain a visual check on all aircraft within the control area. Route navigational aids, spaced as required along the airways, provide the electronic tracks which the pilot uses to hold his



Every day more than six million word groups are filed over AACS point-to-point circuits. This would be 1400 miles of ticker tape.



In the Admiralty Islands, the AACS men made radio receivers out of packing cases and built a radio station a stone's throw from Japs.

course. Such facilities now make it possible for military craft to fly on schedule around the clock, fair weather or foul.

The original personnel strength of AACS consisted of four officers and about 350 enlisted men. Prior to Pearl Harbor, amateur radio operators, or "hams," were recruited into service, and in 1941 the first cadre of AACS men headed for Iceland, Labrador, Greenland, and the Hudson Bay territory of Canada for duty. The rest is history.

Radio operators and maintenance men of the AACS went into the Philippines two days after the Sixth Army stormed the beach. They helped bring a near hundred Navy planes in for landings before the airstrip was ready; they withstood Jap strafing attacks. In the Admiralty Islands, a group turned packing cases into radio receivers and built a radio station just a stone's throw from the front line where the 1st Division Cavalry dug out the Japs.

Hidden beneath the statistical cloak of airway communications traffic lies the story of men fighting a special kind of battle where remote sections of the world provide an ever-changing backdrop. The story of the AACS communications technicians is one of isolation, ingenuity, and initiative—the story of the war and peace in its most unspectacular sense. But the story isn't finished. The fact that the fighting is over doesn't mean that Airways and Air Communications Service can let up for an instant. Their job was defined for them when former commanding officer Brigadier General Ivan Farman said, "The AACS is an organization of young Americans who have the spirit, the know-how, and imagination needed to give the military pilots the information and service they must have." Safety and traffic performance records set by AAF aircraft in the North Atlantic are typical of the same outstanding records set throughout the world. The same type of communications and navigational aids have been standardized for all AAF airways. Now, wherever the military pilot flies—from Leyte, Brisbane, Adak, Natal, Calcutta, or Kunming; or Naples, Rome, London, Dayton, or Paris . . . AACS is there, ready to serve.



It is on lonely battlefronts like this that men of the Army Airways Communication System are waging a strange, nerve-racking war.



"Roger, and if you can hear me rock your tower" was pilot's retort to AACS man asking him to rock wings if he received message.

JANUARY, 1947



When Capt. R. Chamberlain went to pick up crated radios in Calcutta he was told they belonged to AACS—Antiaircraft China Station!

QUIZ

ON AERONAUTICAL ENGINEERING EDUCATION

Here are typical questions asked by men considering careers in Aeronautical Engineering. Men who realize the great opportunities in this field ask such questions in an earnest desire to weigh their qualifications. Perhaps you are at the stage of "thinking about" Aeronautical Engineering. It is for men like you that Northrop Aeronautical Institute presents these questions and answers. We trust the answers will be helpful, and shall be glad to go beyond them by replying promptly to any personal inquiry.

AGE

- Q.** My age is 25. Am I too old to take up training in Aeronautical Engineering?
- A.** No. The average age of men enrolled in Northrop Aeronautical Institute is 24-plus. Some have entered directly from high school. Others have entered after long periods in the armed forces, their ages extending up into the middle thirties. Age is of little importance—educational qualification and personal determination to succeed are the essential factors.

EDUCATION

- Q.** I am a high school graduate with only two years of mathematics. Am I qualified educationally for your Aeronautical Engineering courses?
- A.** Yes. Our entrance requirements conform to the standards prescribed by the National Council of Technical Schools, which specify satisfactory completion of a 4-year high school course, or its equivalent. In many cases, practical training and experience—particularly in the armed forces—take the place of a more formal education.

SERVICE EXPERIENCE

- Q.** I was in the service 46 months. Is this experience of any general or specific value to me?
- A.** To give an exact answer we should have full information on training and duties. Many types of training and experience in the service give a student an aptitude for grasping technical subjects. Also, we have observed that a service background gives a man a sense of responsibility that leads him to strive for success in his studies.

AIR SERVICE EXPERIENCE

- Q.** I was in the Air Force, first as a mechanic, then as a fighter pilot. Will this experience help me in studying to be an aeronautical engineer?
- A.** All types of air crew and ground crew experience contribute greatly to grasping aeronautical engineering subjects, and to becoming a better engineer. Knowledge of aircraft structural details, maintenance problems, performance, design, and flight characteristics helps the student make practical interpretations of his daily study and apply practical considerations in his assignments.

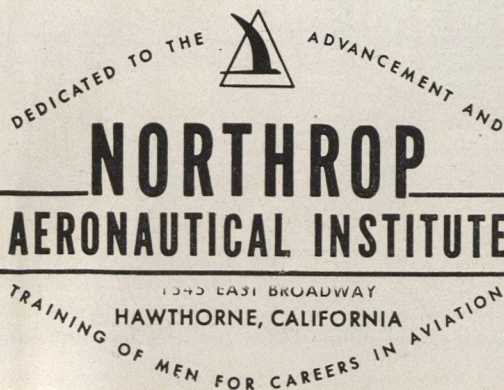
DIFFICULTY OF TRAINING

- Q.** I know I would like an Aeronautical Engineering career but I am afraid the course of training might be too "tough" for me. What do you advise?
- A.** That depends upon the strength of your desire for a career and your determination to succeed. If a man has the proper educational qualifications he can take up an Aeronautical Engineering course with confidence. Our training program carries the student steadily forward from his basic qualifications.

LENGTH OF TRAINING

- Q.** Is it actually possible to get a thorough training in Aeronautical Engineering in a 2-year course?
- A.** A longer school day, year 'round training, elimination of non-essential subjects, and intensive, practical training methods, are advantageous features of our training program. These make possible the equivalent training, in engineering subjects, far in excess of a 4-year college course. In addition, the training is in actual industry methods and prepares a man to step directly into practical engineering assignments.

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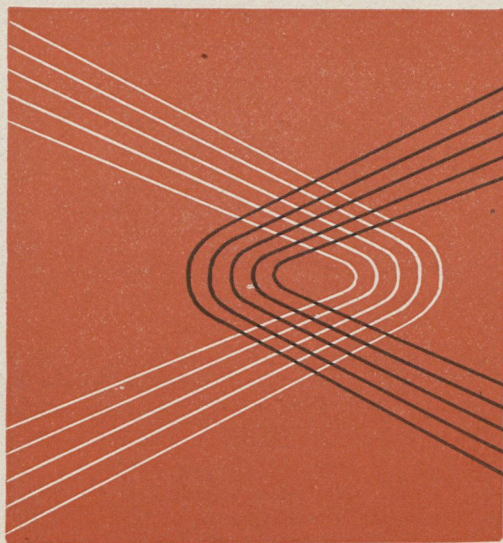
(City) _____

(Zone) _____

(State) _____

Check one. ☐ Veteran ☐ In Service ☐ Civilian

AIR FORCE



the color of **SAFETY**

BY EDWARD R. LEWIS

Decca navigational system, guide of the Normandy Invasion, offers a possible solution to the current airways free-space and control area dilemma

BEFORE the Allies poured ashore at Normandy, British mine-sweepers had cleared the water—by night, in the worst conditions of visibility, and right under the noses of the Nazis' strongest shore installations. Their guiding device was a system created by an American, William J. O'Brien, who had spent a lot of time trying to sell his idea—without success—first to the U. S. services, then to the R.A.F. It was the British Admiralty that recognized its virtues sufficiently to give the Decca Company, which O'Brien had joined, facilities for demonstration. Now, the war over, this system is in actual operation in England and is being presented in the U. S. as a possible solution to the pressing problems of adequate, automatic free-space navigation and of area traffic control when visibility drops.

The Decca system has two general functions. In the problem of free-space navigation, common to both marine and air transportation, the system allows instant location of the aircraft by means of two dial readings. The red dial gives the number of a co-ordinate on a map marked in red; the second, green dial, makes similar indication in green. The position of the airplane is at the point where the two lines meet.

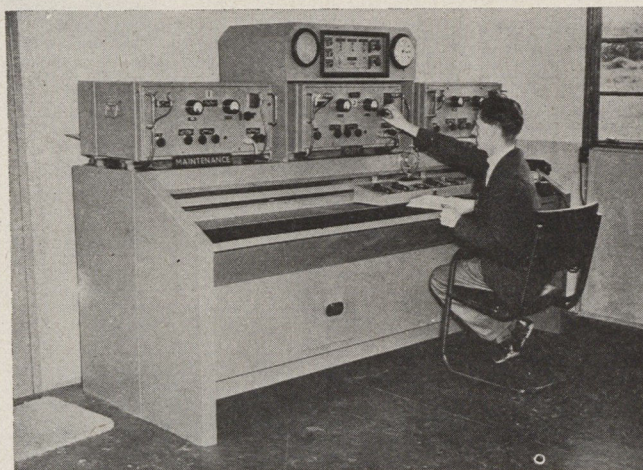
Its second function is designed to serve transport aircraft operating between two set points. The Decca instrument will tell the pilot if he is off course, in which direction, and by how many yards. It will also show him how many miles he has still to go, *ground speed*, and how many minutes he is behind or ahead of schedule. When the plane reaches the control area, the instrument will keep constant indication of a pre-selected orbit if ships are stacked up, or it will bring the aircraft into position for visual or instrument landing. Since it is of low-frequency operation, the equipment is of maximum reliability.

The How of the Decca System

The Decca system is under operational test for both airline and marine operation in Europe, and preparations are being

made for pilot full-scale operation in the New York area. Frequencies for operation are being applied for from the Federal Communications Commission.

To understand the operation of this navigational system, it is necessary first to examine the theory of its ground installation. Picture two stations, situated some distance apart, emitting continuous wave signals of the same frequency. All points on the bisector of a line joining the stations will, of course, be equidistant from both. Therefore radio waves arriving on any point on the bisecting line would have the same phase relationship to one another that they had when they left the station. Points not located on the bisector, however, would have a difference in phase relationship, since their distances from the station vary. If a line were to be drawn through the base line between the two stations and through any point in



Console of the "slave" station of the Decca navigation system, which is now in actual operation under airline test in England.

the form of a hyperbola, which is the locus of a point moving so that the difference in path distances from the two stations is a constant, then the phase relationship between the arriving waves at all points on the curve would be constant. Using the stations as foci, an infinite number of hyperbolae can be drawn, *along* which these arriving waves will have a constant phase relationship, but *between* which the phase will differ.

The problem, then, is to create a means for measuring this phase relationship between the two sets of arriving radio waves, thus determining on which hyperbola one is situated.

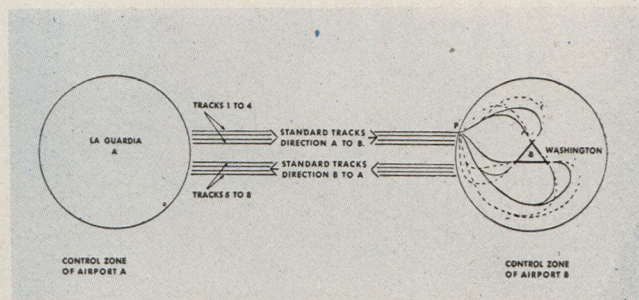
If a third station is constructed and operated in the same manner, a second set of hyperbolae can be created and an exact location fixed by determining the point at which two of these hyperbolic lines cross.

In actual practice, there are three stations, indicated as red, green, and purple slave stations, located in the pattern of a nearly equilateral triangle around a master station. Their output hyperbolae are marked on the Decca navigational charts for particular areas in corresponding colors. Because only two intersections can be used at once, two dials will serve in any position.

In the aircraft, signals from the two stations in the tridrant are fed into a phase discriminator of the diode rectifier type which delivers direct current. The amplitude of this output depends on the phase relationship between these two radio frequencies. The direct current output from the discriminator is passed through the field coil of an indicating meter colored to match the code of the particular slave station. While the operation itself is somewhat complex, the end result is that the red and green Decometers on the instrument panel indicate the numbered coordinate line, and the point at which the red and green hyperbolae cross is the fix on the aircraft.

The system is capable of great accuracy. The aircraft, if fifty miles from the transmitter base line, can be located within ten yards by day and twenty by night. Accuracy, of course, decreases with distance, but not at an alarming rate. At 300 miles the accuracy is within 100 yards by day and 500 by night.

The track control unit, which is an accessory to the stan-

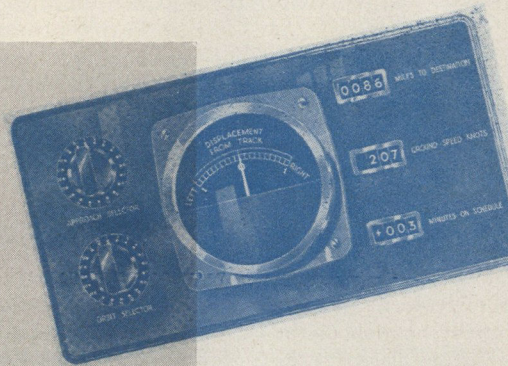
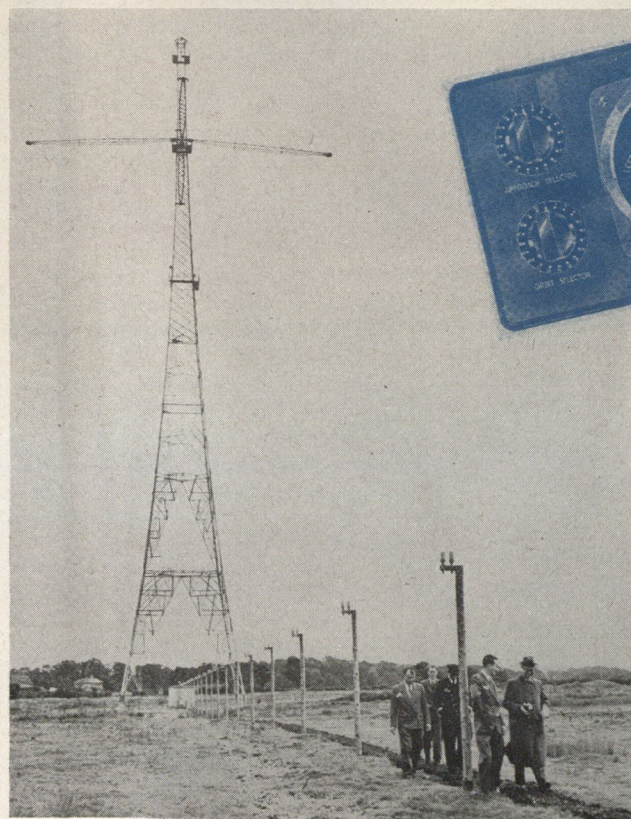


In the new track control system, predetermined tracks are laid down between two cities, with an alternate approach.

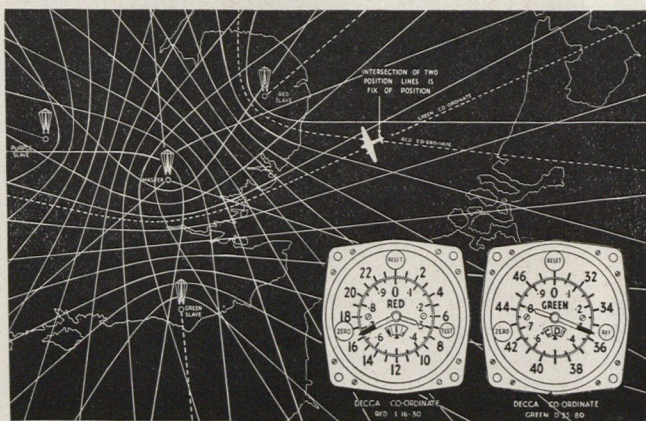
dard Navigator, offers a possible solution to the current air terminal dilemma. Virtually everyone who has ever flown the airlines in negative weather has spent what seemed endless flying time sitting in a stack or waiting at some outlying field because all the stacks and the airways themselves were full of airplanes awaiting their turn to land.

The track control unit provides a system through which as many aircraft as are required can ply between two airports at a desired altitude, following a previously determined track of a shape designed to suit the intervening topography. Upon reaching the fringe of the Ground Control Zone, the incoming plane may be assigned an approach track by the control tower, bringing it into the key position for either visual or instrument landing. The system also makes provision for a number of orbits to which aircraft can be diverted until they are called in via the approach track.

Before it takes off the traffic controller assigns the airplane one of the tracks, and a roll of film marked with the characteristics of that particular track is inserted in the track control unit. During the flight, if the pilot remains on course, the needle in the central instrument of the track control unit remains at zero. If he goes off course, the needle deflects in the direction of the actual heading. Correcting the heading zeroes



A 325-foot antenna mast of one of the slave stations in England shown at left. Center, pilot's control panel on the track control unit. Below, diagram showing the position of master and slave stations and the form of the phase-hyperbolae. Broken lines indicate how the intersection of the red and green readings fix a plane's position.



CROSS-COUNTRY

(Continued from page 43)

carry a complete feature-length story on the Air Reserve and the Air National Guard, with special emphasis on how the individual AAF veteran fits into the picture.

Knock on Wood

Despite prevailing weather and hazardous routes, the Fifth Air Force's 317th Troop Carrier Group recently completed a year of intensified operation in the Pacific without a fatal accident. Routes covered by the group cover long distances of water and high mountain ranges to reach bases in the Philippines, Guam, China, Korea, and the Ryukyus. Headquarters of the unit is located in Tokyo.

The Group's remarkable safety record, set in the midst of rapid redeployment with a lack of skilled maintenance personnel, covers the period from September, 1945 to September, 1946.

Gold Bars for Flight Officers

More than 2,050 former flight officers have been recommended to the office of the Adjutant General for commissions in the Air Corps Reserve, AAF headquarters announced recently. More than 7,400 applications for appointments in the reserve program have been received since June 1, when a policy was established for the commissioning of flight officers as second lieutenants. No peacetime statutory provision exists for the rank of flight officer in the Officers' Reserve Corps. Establishment of a policy was necessary after demobilization began when it was found that all flight officers would be ineligible for reserve participation.

Former AAF flight officers may request the Adjutant General's office in Washington for application forms for Reserve appointments. Recommendations for appointment are made by the AAF upon receipt of records from the A. G.

Last Men in the Arctic Decorated

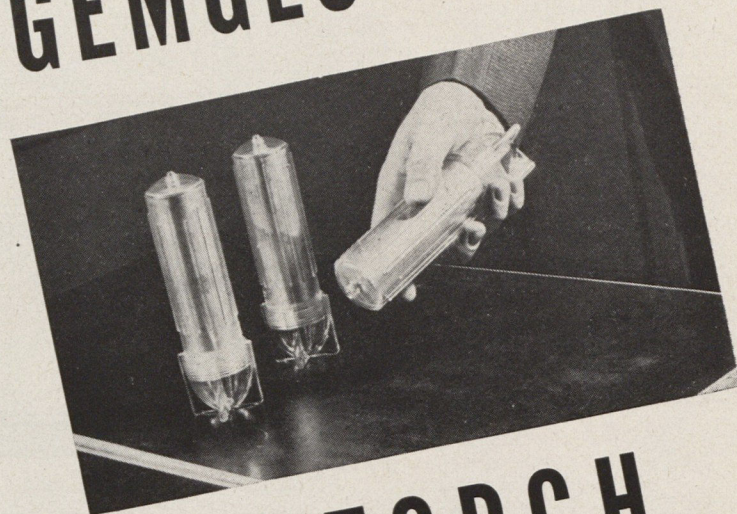
Eleven GIs from the loneliest weather station in the world, marooned by tremendous ice packs at Walrus Bay, Greenland for over a year, have been decorated with the Army Commendation by Brigadier General Dale V. Gaffney, C. G. of the ATC's Atlantic Division for "loyal devotion to duty (under) unavoidable circumstances which caused them to remain at their isolated outpost long after attaining eligibility for separation."

Walrus Bay is one of the most northern of the many weather stations established by the AAF Weather Service during the war, and is several hundred miles beyond the Arctic Circle on Scoresby Sound, on the east coast of Greenland. Set in the midst of towering mountains, and surrounded by glaciers pouring huge icebergs into the sea, the station is accessible for only a short time in the summer of each year, when the ice breaks up enough to permit boats to enter the harbor.

When the AAF decided to discharge all eligible soldiers who wanted to get out after V-J Day last fall, all but one of the Greenland weather stations were restaffed, and the discharges returned to the United States. The one exception was Walrus Bay, solidly closed in with heavy ice.

The men at Walrus Bay had no choice but to grin and bear it, and the AAF could do nothing except wait for the proper time to get them out. In mid-July of this year, the Coast Guard ice-breaker *Storis*, long used to work among the treacherous icebergs and floes of the uninhabited north-east Greenland coast, set out from Narsarsuaq, Greenland. Bucking the southward moving ice pack, and threading its way through water channels in the ice, the ship finally evacuated the men and returned them to the headquarters of the Greenland Base Command. They were flown to New York immediately in a C-54 Skymaster.

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WE EVEN HAD A TREE

(Continued from page 33)

wonder why we can't drop a bomb right down inside the crater of Kiska Volcano and touch it off." "Da da da da . . ." "Shut up," from the cribbage game, "we're trying to add." "Shouldn't it be almost time to hear about the weather?"

They tell you the hard-luck story of Izzy, the popular little bombardier from New York's lower East Side. It seems that after Izzy won his bombardier's wings he got engaged to a girl, and he went down to buy her a ring. "It costs five hunnerd smackers," Izzy himself interrupts eagerly, "but when I tell the jeweler I'm a bombardier, he claps me on the back and says, 'My boy, I'll knock off a hunnerd bucks for every bomb you drop on Germany.'" Izzy sighs. "So what happens? So I get sent to Alaska."

You wait, and finally the phone rings; and the room is suddenly very quiet while the squadron leader picks up the phone. They know the answer by the look on his face. If his face falls, that means the mission is off again, and someone swears softly, and they go back to their cribbage, and magazines and more waiting. But if his face gets very bright and tough-looking, then chairs scrape back hurriedly, zippers are yanked up, they grab brief cases and charts and pile through the door, jostling, shouting over a shoulder: "Keep dinner hot for me." "If anybody has to bail out, remember to fill out your Form One first." "It's a grand old flag, da da da da . . ." "Nobody touch that jigsaw puzzle, I'm going to finish it when I get back."

But he never finishes it; he never gets back. It was a tough mission today. Usually they buzz the field when they get back from a mission; but today they come in quietly, one by one. The squadron leader lands his airplane first and taxis to a halt; the ground-crews swarm over the ship eagerly to count the holes. There are sixty-four holes. Jack murmurs apologetically to his crew-chief: "I'm afraid I didn't do your airplane much good, Sergeant."

"No, sir," with a reproachful look, "you sure didn't."

Russ's plane is late landing; they had a little trouble on the way. One of the bombs jumped its shackle and hung suspended halfway through the bomb-bay doors; the other bombs spilled out over it, but the first bomb still dangled there, and they couldn't get the doors shut again. It looked pretty bad, Russ admits. The opening of the bomb-bay is so small you can't get through with your 'chute on; but the little tail-gunner took off his 'chute and dangled by his hands over empty space until his groping feet found support and he balanced himself somehow, and inched down, and managed to release the bomb.

Mac's plane is the last to land. One tire has been punctured by flak, but the ship wobbles safely to a halt; and Mac sticks his head out of the cockpit. "Bombardier's dead," he announces briefly. You wonder fleetingly whether Izzy's girl will ever know now about that five-hundred-dollar ring.

You stroll back to the hospital with Mac. There is a raw hole in his hand, and he wraps it with his handkerchief as he walks. "Shrapnel," he shrugs; "probably a piece of that Sixth Avenue El we sold 'em." You suppose that when Mac got the metal in his hand, he took some of the sulfa pills which every plane carries for such an emergency. Mac looks a little embarrassed at the question.

"As a matter of fact," he admits, "I didn't know how bad off Izzy was, and I figured the airplane was pretty well stove up, and we might have to make a forced landing somewhere, and there were only a few pills, and I thought he might need 'em. . . ."

They're not heroes. Don't call them heroes; they don't want that. They're not Intrepid Birdmen, or Rover Boys of the Air, or Supermen; they're ordinary guys doing a job, getting

AIR FORCE

cold and miserable and lonely and not liking it any better than you would.

Oh, yes. About our tree. We had it on Christmas Eve. The men went out behind the camp and gathered armloads of brown-green tundra moss, and they fastened it together with baling wire in the shape of a tree. They sprinkled it with shavings from a bar of soap for artificial snow; and for Christmas tree decorations they hung some empty 50-caliber shells they found on the floor of a bomber that had returned from a mission over the target. They made cornucopias out of the red-paper backs of film packs, and filled them with pieces of compressed chocolate and seabiscuit from an emergency ration kit. They fashioned a Star of Bethlehem for the tree, by folding a red cellophane gas-mask cover; and someone produced a truly magnificent bell by cutting up a red-and-green tobacco tin and hanging a .30-caliber armor-piercing shell inside it for a clapper. An enlisted man from Carolina, a gunner with a medium bomber crew, balanced precariously on the back of a chair in his thick-soled leather boots, and suspended the bell from the mess hall ceiling. "Twas the night before Kiska," he murmured thoughtfully.

The long narrow quonset hut was crowded; the men sat on the mess tables and along the benches and on the floor with their shoulders propped against the knees of the row behind them; shaggy, unshaven, their rain-soaked parkas steaming damply in the heat, their soggy boots leaking little pools of black water onto the muddy floor. Most of them were youngsters from the South; they had never seen snow before. The blond nervous Chaplain was trying to be a cheerful M.C., and he kept winking his glasses and urging everyone to sing the Christmas carols he had typed. "All right, fellows, 'Hark, the Herald Angels Sing' and let's all hear it." They draped their arms around each other's bulky shoulders, and sang in the deep drawl of Texas and the twang of New England and the slow slack syllables of Alabama. "'O Little Town of Bethlehem,' what do you say, now, fellows?" A couple of officers at the back of the hall joined in softly; a husky mess cook, stripped to the waist, wiped dough from his forearms and strolled over toward the group. Then the Chaplain held up his hand, and explained about the presents. He was sorry, fellows, but there just weren't any presents. There hadn't been any mail, you see, and so there were no packages to put under the tree, no gifts from home, no candy, no cigars; but—his glasses winked—they'd managed to dig up a few little things at the PX, only of course there weren't enough to go around, so each man had been given a number, and now the Chaplain was going to draw some numbers out of a hat, and if anybody had a lucky number . . . "Bingo," someone concluded, "merry Christmas."

It didn't take long; there weren't many numbers. 27 was a box of matches; the winner walked back sheepishly through a gauntlet of envious eyes. 145 was a bar of chocolate; his tent-mates fell on it and devoured it on the spot. 13 opened his present and displayed it glumly. "No woman for a thousand miles," he muttered, "so what do I get, An address book!" I remember best of all one tow-headed kid from Tennessee, in oversize dungarees and heavy GI shoes, sitting alone at a table at the end of the hall. He had a letter from his mother. He'd received it on October 14th, and he'd re-read it so many times that it had finally come apart at the folds. He was rearranging the pieces intently on the table before him. He was going to read it again on Christmas Eve.

We didn't have any turkeys or plum puddings for Christmas dinner; no shipping space. Our menu consisted of bean soup; lukewarm stewed tomatoes; boiled potatoes which had been frozen and which we didn't eat; bread, without any butter; and Vienna sausage. But I was eating with the combat-crews, I was sitting elbow-to-elbow with these men in leather flying-suits who are fighting our forgotten war up here; and it was the best Christmas dinner I ever had in my life.

December, 1942

JANUARY, 1947



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GO NORTH GO SOUTH

(Continued from page 20)

Farther west, United Air Lines is cooperating with travel agencies in offering all-expense air tours to such places as Colorado dude ranches, Rocky Mountain National Park, Colorado Springs, Pike's Peak, Yellowstone Park, and other points of interest.

On the Pacific coast, Western Air Lines leads the field in vacation travel. Sun Valley, Idaho, with its championship course, this winter will be only a seven-hour hop from Los Angeles by Western. Colorado's thirty winter sportlands have been brought within a mere 4½ hours of the Pacific Coast by 44-passenger, four-engined Skymasters that zip back and forth at the rate of fourteen flights a day.

This winter ski fans will find old favorite lodges and chalets improved and in full operation again after the war, as well as many new and interesting spots.

Within the confines of the United States' southern borders, Florida and New Orleans are the two most popular resort areas. The social calendar of the "goodtime" town of New Orleans is always crowded—from the first of every year when the annual Sugar Bowl game attracts some 7,000 football fans through Mardi Gras time and the Mid-Winter Sports Carnival.

The average temperature for October through March is a comfortable 60.7 degrees, making possible a year-round outdoor sports program. Anglers from all over the country travel to New Orleans for fresh and salt water fish of many species and hunters find here the migratory waterfowl from Canada and the United States which winter in the southland.

New Orleans cookery, featuring Creole dishes prepared from recipes which have come down through generations, is internationally famous, as are the city's patio restaurants.

Florida's many attractions are so well publicized that they need little elaboration. Suffice it to say here that there are a half-dozen airlines with routes to the land of sunny beaches and beautiful women, and the tourist trade promises to be as heavy as ever this year, perhaps heavier.

Farther south, such airlines as Chicago and Southern, American, and Pan American are bringing Latin American playgrounds to the American's back doorstep. In Mexico the government tourist commission is expecting an enormous volume of vacation travel from the States this winter, and is building five new hotels in Mexico City alone to accommodate the rush which begins about December first.

Pan American announces that it is increasing services over key routes in its 70,000-mile Latin American network as much as 500 per cent. Multiple daily service from PAA's United States gateways at Miami, New Orleans, Brownsville, Los Angeles, and New York gives Americans from every section of the country an opportunity to reach a foreign country within a few hours.

Mexico and Central America are within easy reach of California, Texas, Louisiana, and neighboring states. From Miami, such countries as Cuba, the British Bahamas, Mexico, Guatemala, Haiti, the Dominican Republic, and Jamaica are all less than eight hours away by Clipper. Non-stop flights from New York to San Juan, Puerto Rico give New Yorkers, New Englanders, New Jerseyites, Pennsylvanians, and others with limited vacation time a chance to visit the Virgin Islands, the Dominican Republic, Haiti, and Jamaica by means of PAA's connecting schedules at San Juan.

The fabulous "week end in Rio," long a favorite theme of movie-makers and song-writers, is now a possible reality for holidaying North Americans. Vacationists with limited time now can spend three days and nights in South America's famous playground and still be away from their desks only three working days while traveling the equivalent of two-fifths the distance around the world.

JANUARY, 1947

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DECISION OR DISASTER

(Continued from page 15)

ordinators in the early days of the national defense effort in 1940. Coordinators were being named right and left. "A coordinator," he said, "is a man who takes over a mess, and then messes it up plenty more."

Of all places to have a "coordinator," a military organization is the worst. Military organizations exist to safeguard the country in time of imminent peril. History teaches us that no military organization will operate with efficiency unless the lines of command and control are simple and direct.

The Roman consuls with command shuttling back and forth on alternate days—until Hannibal came along and forced them to take a single commander; the Board of War in the American Revolution—until the dark days when the Continental Congress turned to Washington; the Supreme War Council at Paris in the first World War—until the great German offensive in 1918 frightened the Allies into putting Foch in supreme command; these and many other illustrations of the failure of complicated controls in war have been experienced. They should be avoided like the plague.

No organization of our military establishment will answer our present and future needs unless full consideration is given to the question of air power.

Air power tipped the scales for victory in the war. As long as the Germans and Japanese mastered the air, they won their campaigns. When they lost the air, they lost the war. For the future, the importance of air supremacy will be even greater. It may well be that the next war will be fought by air forces alone.

As I see it, we cannot attain maximum exploitation of air power unless we are prepared to give the air forces a position of parity with naval forces and ground forces. The problems of air power should be solved by those who understand air power.

Parity for air might be achieved by creating a separate department of air. But in that case we would have even greater disunity than we have now with two departments. The logical remedy is to create a single department to cover the armed forces, and to have within the department three branches—Army, Navy and Air.

We have a deep knowledge here in the United States of the perils of the divided command. Stonewall Jackson made his military reputation by his Shenandoah Valley campaign in 1862. He defeated three Union armies, one after another. His small force made such a strong thrust toward Washington that the Lincoln Administration felt

it necessary to withdraw reinforcements that had been earmarked for McClellan's army before Richmond. The main Confederate army was thereby saved from defeat. Richmond saved from capture.

Jackson's victories, as well as Lee's subsequent ones, were due to the fact that the North had five armies operating in Virginia. Five separate forces fighting in one theater. Jackson and Lee defeated those Northern commands one at a time. If there had been a single Union command, I daresay the Civil War might have been finished in 1862 with tremendous savings in life and treasure. Grant's reputation likewise was made against divided commands when he defeated two Confederate armies in Mississippi and captured Vicksburg, a disaster from which the Confederacy never recovered.

The point is clear: military forces do not fight to advantage under divided command in a single theater. Virginia was a single theater in 1862: so was Mississippi.

Today we cannot escape the fact that the world is a single theater of operations no larger, in terms of power, range and speed, than Virginia or Mississippi in 1862. Guided missiles of steadily increasing range, bombers which can fly 10,000 miles, flights of four hours from California to New York—these, quite apart from atomic energy have made it so.

Unless we bestir ourselves to place our defense organization on a footing in conformity with the new dimensions of warfare, a conqueror from overseas may do to our disunited forces what Stonewall Jackson did to the disunited Union armies in Virginia.

The advances of science, invention and industry have made their impact felt in warfare as never before. Those advances refuse to follow the easy distinctions formerly available to identify Army activity and Navy activity. A simple illustration is the "duck," a motor vehicle that moves in water and on land with equal facility. Is it Army or Navy? The answer is that it is both. The time may not be far distant when a descendant of the "duck" will also be capable of flying.

Organization in the armed forces should not lag behind the weapons that science and industry have placed in our hands. If we listen to reactionaries, organization will be left far behind, and our armed forces will not be in a position to wage war effectively. A single department, as recommended by the President, is no more than a recognition that national defense has become a single problem.

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COLOR OF SAFETY

(Continued from page 58)

the needle. Errors are shown to one mile in either direction. The distance per meter unit of deviation is 200 yards.

When the pilot arrives at the perimeter of the Ground Control Area, he contacts the tower to receive his track number. The film has all possible approach paths marked on it, so he has merely to select the correct path on his instrument's approach selector, keep the needle zeroed, and follow the path in to the key position for either visual or instrument landing.

Should the airport be stacked up, the airplane can be ordered to an orbit by number. Orbits too are marked on the film. The pilot simply uses the orbit selector to guide him to a position, which he keeps until the ship is called in by the tower. He then switches to the approach selector and comes in. As stated previously, the same instrument gives the pilot a constant corrected ground speed reading and the distance to and from the destination during flight.

The track control system is a channelized method for presenting the information sent out by standard Decca stations. In free-space navigation, it is possible to lay out a course which will give fixed readings on the red and green Decometer. If the green values are coming up too rapidly, it is an indication that the ship is off course to the red zone, and vice versa.

On the film, marks are recorded which represent the spacing on the red pattern. The film is driven forward by the electrical output from the red channel of the receiver, in such manner that every time the plane passes a set interval on the lane, the film moves forward a cognate amount. Parallel to the red track is a set of markings whose spacing represents similar changes in the green lane. This green lane reading represents what its value would be if the airplane were on track, but electrical output of the green channel shows what the value really is. A counter circuit compares the two values, decides if it is high or low. If high, the plane is to the left of the track; if low, to the right; if equal, on course. This counter reading is displayed on the instrument. The distance covered and ground speed readings are merely displayed readings obtained from the rate of crossing the Decca space pattern.

The fact that it is a low-frequency instrument eliminates the high electrical pressures required for many of the navigational devices often used in aircraft. The maximum voltage used in the Decca equipment is 170.

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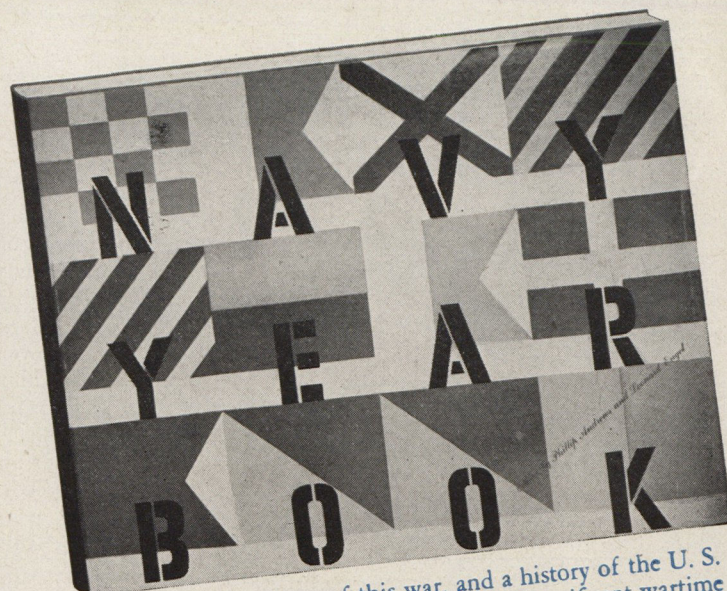
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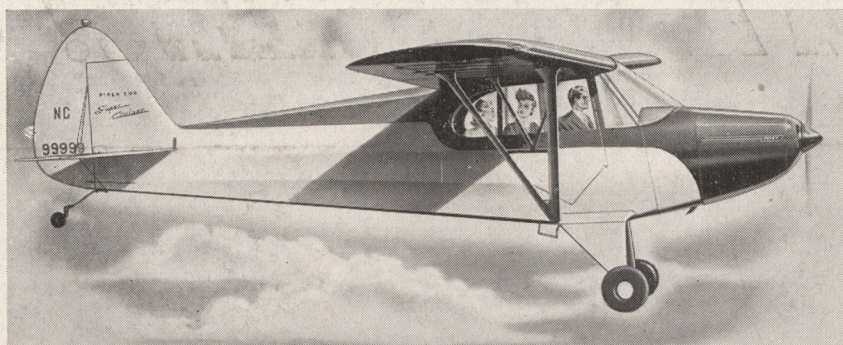
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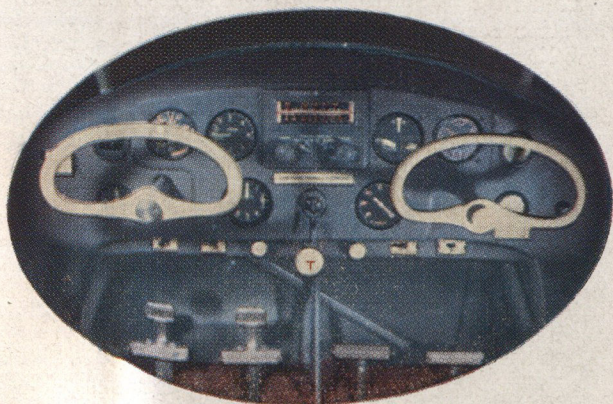
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