AIR FORCE

THE OFFICIAL SERVICE JOUR[illegible] U. S. ARMY AIR FORCES ☆ MARCH 1945

GLIDER PILOT—"G Stands for Guts", page 10

"Oh, landing obstructions don't bother me much. I used to drive a hack back in Brooklyn."

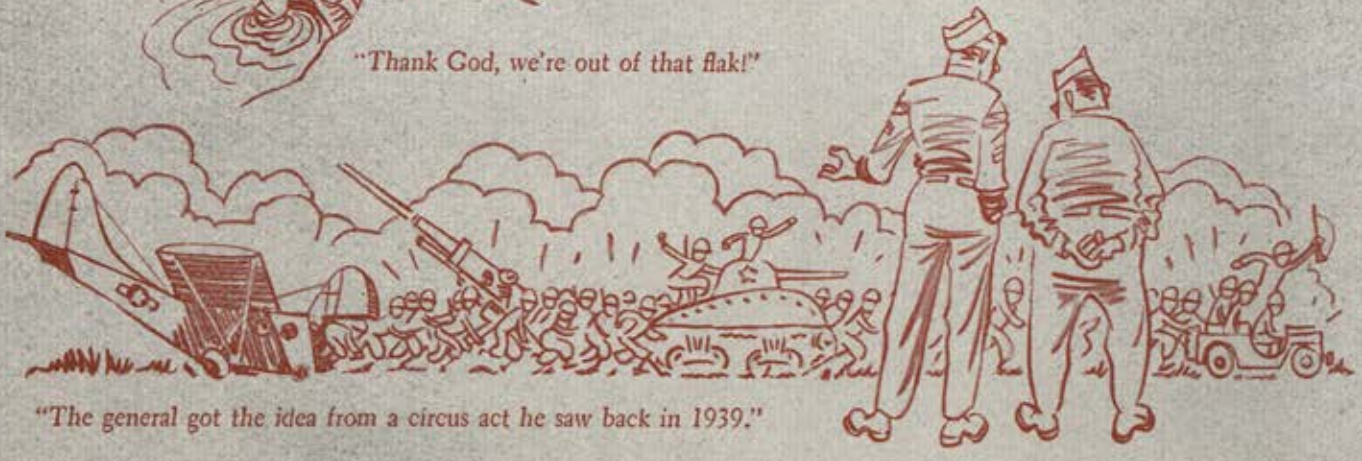
"He calls it 'Point of Sale Merchandising'."

Troop Carrier

by CAPT. WM. T. LENT

"Gosh, I'll bet the CO will be glad to know our supplies have arrived!"

"Thank God, we're out of that flak!"



"The general got the idea from a circus act he saw back in 1939."

Rendezvous

Transfers to the Ground Forces

Dear Editor:

We are having many discussions and varied opinions concerning the recent transfer of Army Air Forces personnel to the Army Ground Forces, and would like to hear from you on the subject.

Are AAF personnel who have served overseas and are now back in the States on replacement, subject to this transfer? If so, I am sure that on hearing of this injustice, the morale of AAF men overseas will drop at least 50 percent. We have here men who have served over two years with AAF combat units, who, I am sure, would prefer returning to combat duty with their branch of service to being transferred to any Ground Force Unit.

If there are any regulations, rules, letters, etc., covering this matter, we would very much like to hear from you.

Sgt. Chester R. Jeffries, DeRidder, La.

Except in cases where it is unavoidable, it is the policy of the AAF that no returnees who have served overseas during the war in an active theater will be transferred to the Army Ground Forces.—Ed.

Chinese Rumor?

Dear Editor:

I have been given to understand that the Chinese Air Force has inaugurated a policy of completing the training of eliminated aviation cadets, and then inducting them into the Chinese Air Force.

Do you have any information on this?

Cpl. William P. Quinn, Denver, Colo.

The rumor that eliminated aviation cadets are being trained by and inducted into the Chinese Air Force is without foundation. —Ed.

Service Pilots' Ratings

Dear Editor:

Can graduates of Advanced Army Flying schools obtain Service Pilot's ratings upon obtaining the requisite experience in Military Aircraft or must the experience have been obtained in Civilian Aircraft?

Maj. Ernest C. Burghduff, Dayton, Ohio

See Questions column on Page 39.—Ed.

Two Men's Lives

Dear Editor:

I have a suggestion that has saved two men's lives on my crew. I'm the engineer on a B-17G, the best heavy in ETO.

Using control cables that have been discarded, I've braided two snap hooks on each end, one fastening to the chest ring on the harness and one to the chute (chest packs only). The gunner can always locate his chute in case of a collision, etc., and can snap it on in a hurry.

T/Sgt. Robert G. Farver, APO 559

Headquarters says you deserve a pat on

(Continued on Next Page)

Vol. 28 No. 3 March 1945

AIR FORCE

THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES

DEPARTMENTS

FEATURES

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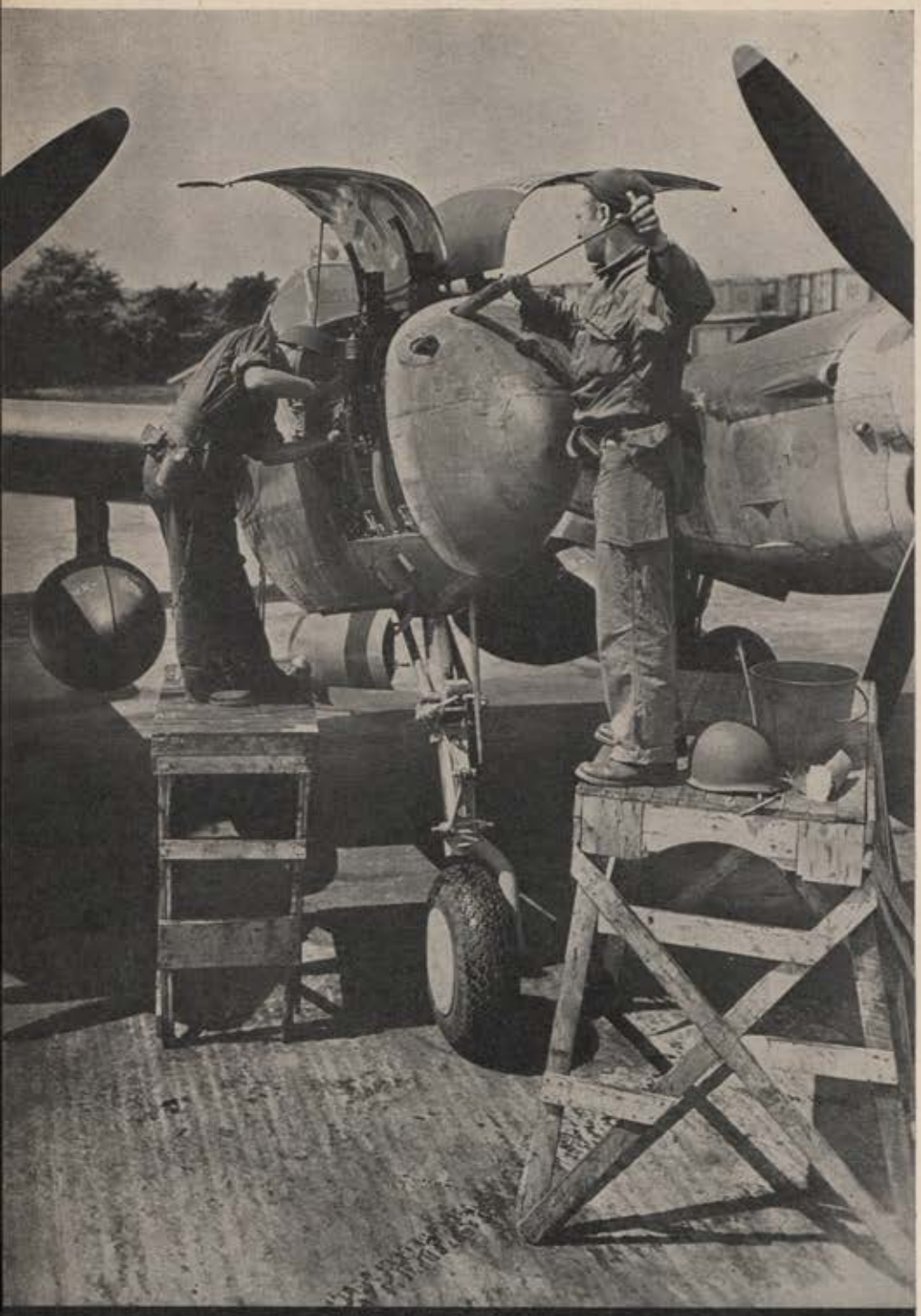


How Sharp are YOU?

You've got 60 seconds to paste your peepers on this pic and find out for yourself how many of its details you can remember. You'll discover it's not so simple as it looks when you turn to Page 45 and try to answer the questions you'll find there. Score 10 for each correct answer. 100 is perfect. Ready . . . go!

HOW SHARP ARE YOU? Turn to Page 45

Rendezvous

(Continued from Page 1)

the back for your ingenuity. They add that new heavy bombers will soon be equipped with racks to do this same job.—Ed.

Sharpies

Dear Editor:

. . . The sharpies who make up the quiz "How Sharp Are You?" should practice a little on AIR FORCE itself. Your January edition uses an illustration in the article "Into Hidden Valley" captioned "a C-47 coming into land . . ."

Well, that speedball in the cockpit is landing wheels up. Furthermore, he took the wrong airplane because he's actually in a C-78 . . .

Lt. Lane Beatty, Turner Field, Ga.

P.S. Did he make it?

Dear Editor:

. . . I hope the crash crew was standing by . . .

Sgt. Jack W. Crockett, Herington, Kan.

Dear Editor:

. . . You have slandered one of the finest aircraft now in service. As an old, old AT-7 pilot it hurt me deeply to see the AT-7 pictured thereon called a C-47. In closing, let me say Tch, Tch, Tch! . . .

Lt. Tom L. Heffner, San Marcos, Texas.

Dear Editor:

. . . If that is a C-47, I'm a P-38. Are you sure it isn't a C-78 or some other Beech-made aircraft? . . .

Lt. Henry Scheingold, Monroe, La.

Dear Editor:

. . . It is the opinion of this office that the plane in the picture is a C-78, and if we should prove to be wrong we are willing to eat the tail surfaces . . .

Sgt. Leo H. Hoder, Spokane, Wash.

Dear Editor:

. . . To me it resembles a C-45. "Is it is or is it aint?" . . .

Sgt. Jess L. Lowery, Alexandria, La.

Dear Editor:

. . . If the airplane is a C-47, I'll eat crow . . .

Maj. Waldo C. M. Johnston, Millville, N. J.

To readers Beatty, Heffner, Crockett, Scheingold, Hoder, Lowery and Johnston and a host of others who have jumped us on this one: It's a C-45 and it's buzzing the field, not landing. Our ex-caption writer says he is not happy in his present work.—Ed.

Battle Jackets Again

Dear Editor:

There is a group of officers, returned from combat, on the airbase where I am now stationed. We have a problem on our hands and we can't decide whether it can be called a gripe, or what.

The situation is this: While overseas in the ETO we were authorized to wear an article of wearing apparel known as a "Battle Jacket." It was considered as class "A" winter uniform, and a lot of officers

went to the expense and trouble of having jackets made.

Since returning to the States, we have been informed that these jackets are not authorized as part of our uniform.

What we would like to know is have we just thrown our money away?

1st Lt. Joseph L. Messer, Jr.,
Gulfport, Miss.

As indicated on Page 23 of our January issue, the jacket may be worn. (WD Cir. 391, 1944.) However, there has since been an amendment (Sec. IV Circ. WD No. 1, 1 Jan. 45) which changes the picture somewhat. The original purpose in authorizing the wearing by officers of wool field jackets (dark shade) was to permit the wearing of such jackets by officers who had purchased them overseas. The effect of the new amendment is to withdraw the authority to purchase dark shade jackets hereafter. In order to insure maximum conservation of materials, however, officers will be permitted to purchase the dark shade jacket until the present stock is exhausted, and will be permitted to wear such garments until worn out. Thereafter, officers will confine their purchases to the regulation wool serge jacket, shade No. 33, same as for enlisted men.—Ed.

Thunderbolt's Powerplant

Dear Editor:

Could you tell me if the P-47 (Thunderbolt) ever had an inline engine?

S/Sgt. V. Palmieri, APO 832

According to Republic's production manager, no Thunderbolt has ever had an inline engine, although an experimental plane in early 1941 used a V-type engine.—Ed.

The Voice of Experience

Dear Editor:

Here are our gripes. Concerning pilots: 1. They don't fly close formation. Because a new pilot doesn't see fighters for five or six missions he gets lazy and doesn't keep his ship tucked in. Then one day the group gets hit and a squadron with ships out of position doesn't come home. 2. They don't fly airspeed as well as position on bomb runs. Too often a ship will lag a little on the run and to catch up the pilot applies power, and just before 'bombs away' the ship is in a nose-high attitude in order to keep from overrunning, or the ship is indicating excessive airspeed in a level attitude. In any event, the bombs are thrown over the MPI. Use plenty of rpm on bomb runs and fly throttle formations, not turbo knob. 3. Pilots don't keep their crews informed on what is going on.

Copilots. 1. They don't accept their share of responsibility. 2. They don't know their airplane. 3. Gripe about being copilots.

Gunners. 1. Gunners don't keep on the alert during a mission. We led a squadron once that had its low element shot away without returning a burst. 2. Gunners either don't call out incoming aircraft or else call out every friendly fighter in the sky thus overworking the interphone and bothering the navigator, bombardier, and pilot on runs.

Navigators. A lot of navigators can keep

(Continued on Page 57)

In This Issue

The glider pilot on the cover this month is Flight Officer William Preus of Verona, N. J. He is 22 years old, holds the Air Medal with Oak Leaf Cluster, and wears battle stars on his ETO ribbon for the Normandy, Southern France, and Holland invasions. His glider was shot down in the Holland push. His wife lives in Verona and his mother, Mrs. Katherine Preus, is foreman in a war plant in Waltham, Mass. For the low-down on glider pilots see "The G stands for Guts" on Page 10 of this issue.

The photograph of Preus was taken by our staff photographer, T/Sgt. Roger Coster, who was also responsible for the Flight Nurse cover last October and the Jet Crew Chief cover in January. Coster has just shoved off for the ETO where he will cover as much of the war as is possible for one small man with a camera. The fact that he is a native Parisien who once served in the French Army will probably be no handicap.

With Coster as Overseas Correspondent went Capt. Eric Friedheim to report activities of the 8th and 9th Air Forces. Friedheim's article "The Enemy Is Listening" appeared last month. He is co-author, with Sgt. Samuel Taylor (who wrote "Portrait of A Crew Chief"—remember?) of a book scheduled to appear shortly under the title "Fighters Up." It will be Friedheim's second tour in the ETO; his first lasted well over a year.

To the Pacific, meanwhile, went Majs. Tom Hardman and Milton Krims. Krims, who had more than a year with the 5th Air Force as boss of a combat camera unit, is heading for Saipan to cover B-29 activities. Hardman goes to the Philippines to replace Maj. Herb Johansen (see "Banzai at Burauen," Page 4) who just returned, full of tall tales and the color of an old saddle from sun or atabrine or both.

Speaking of Saipan, Johansen brings back the report of the B-29 that returned from a strike over Japan with both engines on one side out of commission. Flak damaged one engine so badly that the prop flew off and knocked out the second engine. For a thousand miles the crew nursed the Superfort along, expecting momentarily to have to ditch. But she kept flying, and when they got back to base the pilot was so proud of her and had so much confidence that he didn't even bother to call for an emergency.

Our correspondent in India-Burma, Capt. Larry Bachmann, who wrote "Blister Club" in our last issue, is also full of B-29 stories. He tells of a Superfort returning from Singapore with one engine knocked out and bomb bay doors stuck open. After much conversation on the radio their CO at Group Headquarters advised them to ditch, but the pilot — a little irritably — pointed out that he couldn't ditch with his belly gaping open. It looked like a bail-out, but at the critical moment another B-29, which was flying the Hump with a load of gasoline, cut in on the command frequency saying that he was the regular pilot of the troubled Superfort—and gave advice on how to close the bomb bay. The doors were closed according to his instructions which were relayed by Group—and the B-29 landed at Akyab on a field officially considered too small for peashooters.

In connection with the super-ruggedness of our Superforts see the article on Page 29 which has something to say about the relation between design and performance. This article, called "Design—Key To Air Superiority," is a good example of the work of our lay-out genius and art director, S/Sgt. Seymour Robins, who did the same service for "AAF, Official Guide To The Army Air Forces." In civilian life he was art director for all promotion for the Hearst Magazines.

Another civilian star is S/Sgt. Mark Murphy, also of our staff, whose latest report from ETO, "Tac R," appears on Page 13. Once a frequent contributor to The New Yorker, Murphy has become this magazine's expert on jeep trouble. Almost all his letters begin, as did his last, with an involved dissertation on the state of his jeep: "I am in Belgium waiting for my jeep to be repaired. This time it was climbed over by a six-by-six truck. No one hurt, but the jeep mangled." He promises an article on jeepery for a future issue.

When Jap paratroopers dropped on Leyte, some of our so-called chairborne troops showed they could be plenty tough in a fight

BANZAI AT

BY MAJ. HERBERT O. JOHANSEN

AIR FORCE Overseas Staff

"Two men, isolated in the tower, gave a running account as the crazed Japs hacked at gas drums, shot off flares in a mad orgy of destruction."

By the end of the first week of December, 1944, the 5th Air Force was firmly established on Leyte in the Philippines. Its headquarters at the town of Burauen was functioning smoothly. No one in headquarters considered it remotely possible that a horde of fanatical Japs could appear out of thin air. Yet that is precisely what happened.

It all began around dawn of Wednesday, December 6.

The Negro cook of an aviation construction battalion, located on the Dagami road about a mile north of 5th Air Force Headquarters at Burauen town, was preparing breakfast, frying some precious locally purchased eggs. He heard some shots outside and shouted in an annoyed voice for the boys to "quit dat foolin' around." A moment later, instead of GIs, he saw a group of Jap soldiers armed to the teeth sneaking up on the mess hall.

The cook grabbed his M1 rifle, leaned it on some piled ration tins, and fired. When there were five dead Japs lying just outside the kitchen, he turned back to his stove. Then he lost his temper: the eggs were burned beyond salvage.

The cook's serenity didn't pervade the entire camp, however. There was a lot of wild shooting, a lot of running. Some 15 minutes after the Japs had broken into the area, a lone Negro soldier, barefooted and clad in a pair of blue shorts, came running into the camp of 5th Air Force Bomber Command half a mile down the road.

"Japs," he shouted at the top of his lungs. "Them Japs is comin', they done broke through an' killin' like mad!"

As the shooting had already been heard at BOMCOM, the soldier was taken to an intelligence officer whose first task was to calm him to coherency. The first fact brought out was that the construction outfit had been attacked by a "lot" of Japs (it was later determined that about 150 Japs had infiltrated during the night). The Americans had returned the fire but soon had run out of ammunition. The soldier, whose name was Willis, had been sent back to get more ammunition, infantry, tanks and planes "cause the whole Jap army done broke through."

The officer gave orders to issue ammunition and strengthen the perimeter guard. He also notified higher headquarters, already clamoring to know what all the shooting was about.

Meanwhile, back at the scene of the breakthrough, another aviation service outfit had gone into action.

As a routine precaution, the 1804th Ordnance Battalion, Aviation, located 600 yards from the entrance to Buri strip, had six guards stationed at three vantage points along its defense line. At 0625 the monotony of their vigil was broken by wild shouting in Japanese and the fire of small arms from about 100 yards to the north, and coming closer. One of the guards ran to notify the commanding officer while the others concealed themselves and awaited developments.

The CO, Capt. Robert W. Marriott, of Philadelphia, Pa., issued terse and simple orders. In a matter of minutes the entire personnel of the outfit had been formed into a defense line. Most of them were dressed only in shorts, some had one sock on, others were barefooted. The only uniform items were tin helmets and carbines.

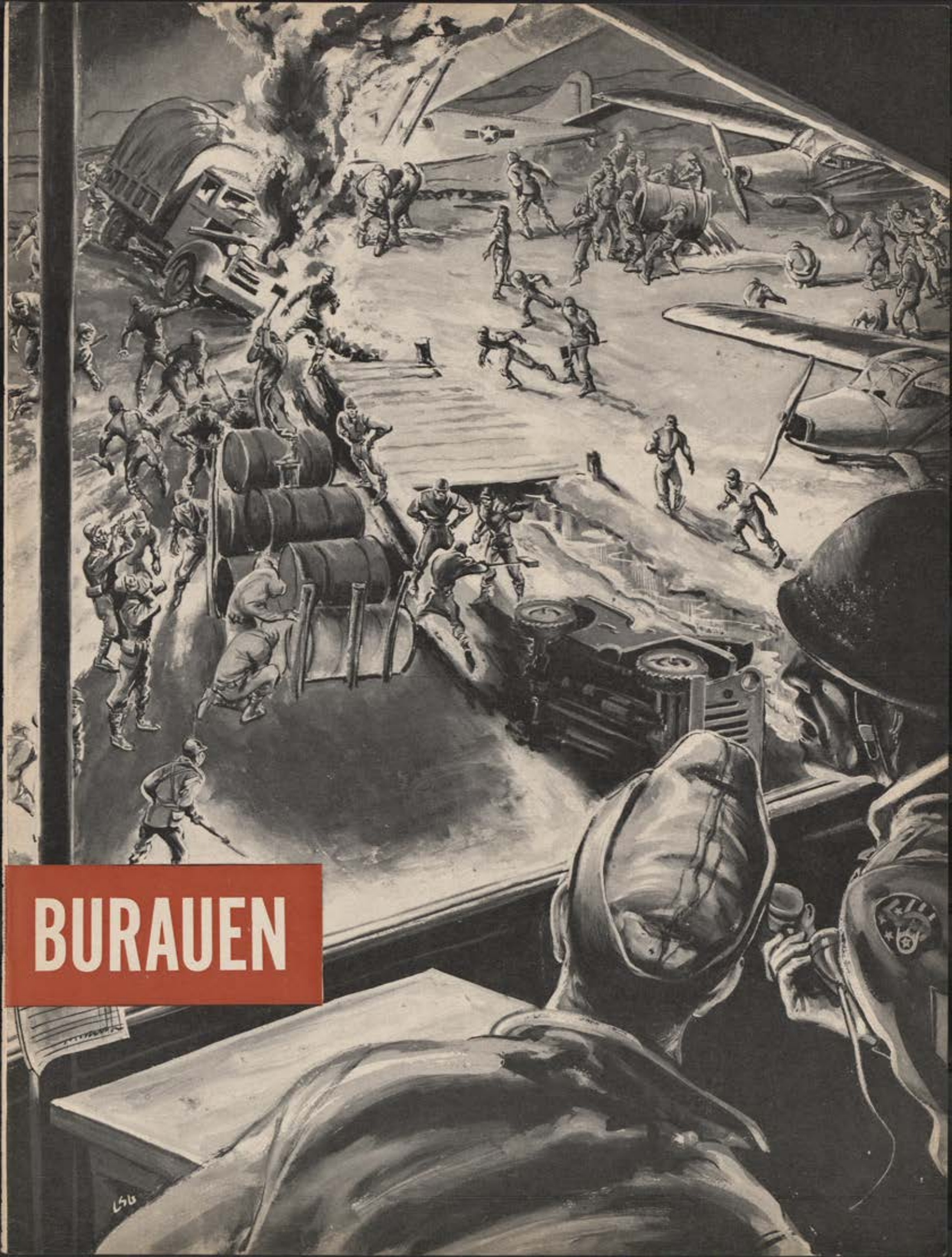
Within less than half an hour elements of a tank battalion bivouacked on the outskirts of Burauen had responded to a call for help. Together with two medium tanks and some 30 men, the 1804th fought a holding action against a fierce onslaught of Japs who had by then penetrated the area, bringing up automatic weapons and throwing hand grenades. At the same time they covered retreat of a signal company that was unable to defend itself.

The first shock of surprise over, Lt. Donald Watkins, of Dayton, Ohio, led a group of his service troops in an advance westward, forcing the Japs to withdraw into a coconut grove, leaving several dead behind. At 1030 a liaison plane was overhead spotting the enemy for the tanks. When the pilot signalled that there were some Japs in a rice paddy, Lt. Joseph Schmid, of Queens, Long Island, New York, led a skirmish which routed the enemy, killing at least two. Enemy machine gun fire then pinned down the Americans for several hours until they were relieved by the arrival of infantry troops. Lieutenant Schmid and one enlisted man were wounded, two enlisted men were killed.

By the time reinforcements from an airborne division took over defense of the area at 0030, the 1804th had killed at least 25 Japs, an enviable record for a service battalion that had neither been trained nor equipped, nor led to expect actual combat with the enemy.

Toward afternoon the situation was well in hand. It was far from peaceful, however, with constant firing of small arms and automatic weapons. A startling change had come over Headquarters, 5th Air Force. Officers and enlisted men sat at their desks with helmets on, .45s strapped to their waists, or carbines leaning conveniently nearby. Everyone was a little sheepish, a little scared, a little thrilled. It was a unique situation for an air force headquarters to find itself suddenly several miles in advance of the infantry's front line perimeter in combat with the Japs. There was the irony, too, of an air force with a thousand planes and more at its command unable to do much of anything about it but sit and wait. At the time a couple of hundred P-38s, B-25s and B-24s would have seemed a fair trade for a couple of hundred infantrymen. It was highly unorthodox and compromising for the powerful Philippines Assault Air Force.

Mess time came that evening, and everyone relaxed somewhat. The firing had died down to a sporadic crack of


BURAUEN

rifles and an occasional burst of machine gun fire. The events of the morning seemed far away and unreal. A group of officers sitting outside the officers' mess was not too concerned about the night that lay ahead. Guards had been doubled and tripled. The whole thing had been an abortive Banzai raid. Tomorrow everything would be normal again.

As they sat smoking and shooting the breeze a roar of engines came out of the southwest. Then came the planes, 13 twin-engine bombers.

"Those boys sure are flying a perfect formation," one of them observed casually.

"Probably back from an Ormoc mission," contributed another, "but I didn't know we had any twin-engine bombers out today. How about that, Mac?"

"Hell," replied Mac, jumping to his feet. "We haven't got any 2-engine bombers on Leyte . . . those must be Japs!"

"In a matter of minutes the outfit formed a defense line. Some were dressed only in shorts, some had but one sock on."

The ack-ack and the rush for foxholes started simultaneously. The sky became a backdrop of brilliant fireworks. The planes didn't waver, the formation remained intact. Directly overhead they droned, the red ball of the rising sun plainly visible, heading straight for the airstrip to the east. They went into their bomb run. Then came the explosions, and as heads raised cautiously above the foxholes, apprehensive eyes saw a heavy smoke screen ascending less than a mile away.

"Smoke bombs," said someone in a faraway voice.

"And more planes," shouted another.

This time the drone of motors came from the southeast. The planes that followed, flying at about 500 feet, at first looked like C-47s. But that didn't make sense.

"C-47s, hell!" shouted an officer who prided himself on recognition. "They're DC-2s."

"Jap transports . . . must be 20 of them . . . heading right for that smoke screen over there towards Buri!"

A few minutes later the telephone rang at Headquarters Squadron. The Commandant, a major, picked up the receiver, recognized the voice of an IO at BOMCOM.

"Spiders are dropping over Buri strip," said the voice.

"That does it," said the major. "Are you sure?"

"Sure I'm sure, Major. Saw three paratroopers come out of one of those Jap transports myself."

"That means probably 200 or 300 paratroopers."

"Don't I know it!"

"Puts you in sort of a bad spot up there on the hill."

"You're telling me, Major . . . and what the hell do we air force guys know about that kind of fighting?"

"That's what we'll find out. Well, do the best you can until we can get some infantry up. This mud is hell, you know, but maybe Daniels can get some of his tanks up there."

The Headquarters Commandant of the 5th Air Force hung up. Immediately the phone rang again. It was a general wanting to know what all the shooting was about this time and didn't those trigger happy so-and-sos know that the situation was well in hand.

"It's well in hand, all right, General," the Major informed him . . . "in the hands of a couple of hundred Jap paratroopers who have just been dropped less than a mile from the general's house."

Two weeks of almost steady tropical rains had converted the mile or so square area of the 5th Air Force Headquarters into a mud wallow. BOMCOM was on a hill overlooking the paratroop landing. A tight defense line was quickly stretched almost solid along the perimeter with colonel and GI alike trying to remember when he had last cleaned and oiled his firearm and silently swearing never to be so lax again. In the area between Buri and San Pablo strips, less than half a mile away, the Japs were shouting and yelling and it was unpleasant music to the grim, silent men waiting on the hill. It was dark now and there was nothing they could do but sit tight and wait.

The area into which the Japs had dropped consisted of flooded rice paddies, water buffalo wallows, grass covered swamps, beautiful for saké-inspired Banzai raids, bewildering to chairborne headquarters troops. To make it worse no one really knew how many Japs there were.

An incredible macabre scene was taking place on San Pablo strip. Jap paratroopers were running up and down the strip as if drunk or drugged. They were singing, shouting; three were playing musical instruments—a jew's-harp, a harmonica and a small horn, evidently some kind of identifying and rallying instruments. They shouted, "Hello . . . hello . . . where your machine guns . . ." . . . hacked at gas drums, splashed the gas over several liaison planes. They threw lighted matches in the gasoline, screamed madly as they flung themselves into an orgy of indiscriminate destruction. Two men isolated in the tower telephoned a blow by blow description. The Japs simply didn't make sense; they shot off flares promiscuously, shot holes in wash stands, burned a jeep, overturned a truck, burned several L-5s. But other aircraft nearby, large ammunition dumps, CP areas and other important installations were unmolested.

Up on the Dagami road the 1804th Ordnance had dug in for the night. The entire personnel of the unit had been formed into a defense battalion. A 24-hour watch had been set up. Three sides of a rice paddy were strung with steel wire. Every 15 feet booby traps were installed, hand grenades with the safety pins attached to the wire. More than one Jap kicked the wire, set off a grenade alarm and was welcomed with a well-placed bullet. One Jap who got through the defense line was killed by a private firing through the mess hall screen, but not before he had thrown a hand grenade in front of the supply tent command post, seriously wounding several enlisted men.

The commanding officer of the 1804th had issued strict orders that there was to be no promiscuous firing, "If you see movement beyond the perimeter out there, hold your fire until you're sure it's a Jap and not a carabao."

Mindful of the order, some of the 1804th's enlisted men on guard duty at night hesitated when they heard splashing sounds in front of them, followed by a muffled cough. As there was no natural history book handy to tell them whether water buffalo coughed, they played safe, hurled five hand grenades and let go their Thompson sub-machine gun. There was no more noise as they sat through the rest of the night. When the first light of day revealed several dead Japs sprawled some 15 feet away, they drew a sigh of relief.

"Jeez," said one, "if they had been carabao the major sure would have burned our tails."

During the next three days the 5th Air Force Headquarters strained to carry on in a nonchalant "business as usual" manner, an attitude difficult to maintain with ma-

chine gun and rifle bullets whizzing through the offices with disconcerting regularity. Rangers and other infantry units of the Sixth Army had sloughed their way through the mud, and were greeted by the 5th Air Force with unrestrained affection. An infantry company was invited and even urged to put up its command post tent right in the officers' living area. As an added attraction it was placed within smelling distance of the mess hall. The best to be had was on the house for the doughboys. And for the doughboys, after four weeks of sleeping in mud holes every night, lucky to get one K ration a day, eating three meals a day out of plates with knives and forks, sleeping on cots, going to movies, it was paradise, a rest camp. It was one for all, all for one and everybody against the Japs.

The tank battalion under command of Maj. Leonard P. Daniels, was located in an area adjoining the headquarters building. It was a beautiful and comforting sight to see a series of Sherman tanks spaced some hundred feet apart, a machine gun nest in the middle of each interval. Stocky Major Daniels was proud of his outfit, informing everyone that his boys had shot down three Jap fighters in the early stages of the Burauen battle. What's more, he was sure his outfit could hold off an entire regiment of Japs should they attack his line, this last observation being of questionable comfort to the admiring headquarters men.

Gradually, men relaxed and by the night of December 10 they were beginning to joke about the incident. Then, of a sudden, at 1930, all hell broke loose again. Fifty caliber bullets tore through the tents of the tank battalions, through the plywood walls of Maj. Gen. Ennis C. Whitehead's house across the road. The Japs had no fifties . . . yet there was no doubt of these guns being 50 caliber after the tracers, one in four, were counted. The General ducked a bullet, ordered someone to find out who the blankety blank was responsible and that he'd blankety blank better stop it or think up a blankety blank good reason. The 5th Air Force had gone without sleepless nights long enough!

A staff officer traced the firing to the 8th Signal Battalion, Aviation, got Lt. Col. Paul V. Kaessner on the telephone. "Colonel," he said sternly, "you've got to stop that promiscuous firing down there immediately."

"Like to, sir," answered the colonel, "but the Japs . . ."

"Japs," shouted the staff officer, "Can't be Japs. That fire is coming from our fifties."

"That's right . . . and the Japs are doing the shooting."

"Where in hell did the Jap's get our machine guns?"

"How in hell should I know, sir?"

"The bullets are coming right through the general's quarters."

"Tell the general to get down on the floor. Incidentally, that yelling you hear is a Banzai raid on our mess hall."

The Japs broke into the signal area, shouting, "Signals, surrender, no?" They fired mortars, rifles, machine guns, threw hand grenades. They set fire to tents, rifled personal luggage, attached booby traps to vehicles. Colonel Kaessner's men fell back until they reached the hospital which was already crowded with wounded. There they reorganized and held. They did more than hold; they counterattacked, forced the Japs to retreat. By 0300, there wasn't a live Jap left in the area. They counted 30 dead Japs. The signals lost two dead, two wounded.

Meanwhile, Burauen and headquarters had once again been thrown into an uproar. Major Daniels "ordered" General Whitehead to the tank battalion command post

(*Continued on Page 46*)

"General Whitehead snapped orders like a tank commander — busy with a new kind of war for an air general."

phase 1

Whittling-down the enemy air strength. This ME-109, shot down over Normandy, symbolizes the highly successful pre-D-day destruction of the Luftwaffe.

phase 2

Isolating the battlefield. This was the long-continuing phase that began before D-day, reached new peak of effectiveness against General von Rundstedt. This photo shows B-26s bombing Moselle bridge, key supply route.

phase 3

Direct cooperation with ground forces: P-47 radios to U. S. tanks a report on Nazi tank columns it has strafed.

How the AAF, in tactical air operations, applies a principle as old as warfare

Isolating the Battlefield

BY BRIG. GEN. FREDERIC H. SMITH, JR., AAF

Jeb Stuart used to say that his cavalry got ahead of the enemy by getting behind him. His favorite tactics were surprise and sharp attack where the consequences to the enemy would be most damaging and most lasting—at the crossroads of reinforcement and supply.

To this economical and highly selective kind of warfare, the modern airplane has added tremendous speed and striking power. Perhaps most important of all, the airplane has made it possible to change the hit-and-run cavalry raid, often a matter of lucky encounters, into a sustained operation directed day after day at definite and profitable targets.

Tactical airpower has recently been employed with tremendous effect in the Belgian Bulge, where General von Rundstedt's forces have been subjected to punishing attack. This was the second of two closely connected demonstrations of tactical airpower in Western Europe, the first having been the operations in Normandy.

The conditions under which we put the theory in practice in these two instances were dissimilar; in one case we were on the offensive and in the other we were on the defensive. Taken together, they present a very complete picture of the tactics and technique of tactical air operations in the isolation of the battlefield. This phase of tactical airpower is made possible by Phase 1—the whittling-down of enemy air strength until our own airpower is assured of definite and marked superiority wherever we choose to concentrate it. It may be preceded, accompanied, or followed by Phase 3—direct cooperation with our ground forces in the role of emergency or supplementary artillery. Both of these phases have been widely treated and are generally well understood; therefore this article is concerned principally with Phase 2, isolation of the battlefield.

Before the invasion of France began, our Phase 1 had been attained. The German Air Force could not possibly meet us on anything remotely approaching equal terms. It was certain that even if the Germans sent over everything they had on D-day, there was no possibility of seizing control of the air. Perhaps because the Germans were resigned to this fact, the GAF did not make an all-out effort.

Meanwhile, even before D-day, we had gone to work on Phase 2, isolating the prospective battlefield. This had to be done with discretion. We knocked down the Seine bridges because that operation could not indicate to the Germans where we were going ashore. We left the Loire bridges because their destruction would have been a complete giveaway. We took care of them on D-day and the days immediately following. For supply by rail, the German forces facing the Normandy landing were quickly reduced to dependence on the lines that ran between Paris and Orleans.

While blocking off the whole area at these important river crossings, our tactical air forces were also busy scouring the country behind the German 7th Army. In overwhelming air strength they attacked everything visible in the way of moving materiel, armor, trains, supplies and personnel trying to get up to reinforce Rommel. In effect, the Germans found a Jeb Stuart sitting on every crossroad for a hundred miles behind them.

The summer days of northern Europe are very long and the Germans had only three or four hours of darkness in which to move.

Gradually von Kluge's whole army was shut off from effective reinforcement. Attrition of the remaining motor vehicles on which he relied for mobility assisted the breakthrough at St. Lo and spelled disaster for the Germans. The certainty of that disaster had been apparent all along. No challenge to Allied power had been made by the GAF. With few interruptions, the build-up of troops and materiel went on across the beaches.

Lacking reinforcements, food, gasoline, and armor, the enemy faced an Allied force of steadily increasing power. The Germans had to break.

The effectiveness of this isolation of the battlefield—which the Germans had demonstrated under quite different conditions in 1940—was a bitter lesson for enemy forces. After the first two weeks, for example, some members of a "Panzer Lehr" outfit were captured. That division had come from a concentration area near Chartres. At the time of the landing, they were about 100 miles away—and it had taken them eight days to get their elements into the battle. Had it not been for our tactical air units, they would have been fighting on D-plus-1. Parachute divisions in nearby Brittany were delayed for two weeks; and even then they dribbled in on bicycles and on foot. Ninety-nine percent of their motor transport had been put out of action.

Quite apart from such dramatic facts as that Field Marshal Rommel lost his life to the "Jeb Stuart" air forces, these tactical operations in Normandy will remain a subject of close study. They preceded and accompanied our breakout from the peninsula and subsequent overrunning of France. As General Eisenhower has cordially said, they were vitally helpful in both achievements. During more recent operations in France and Belgium, tactical airpower has been revealed in another and equally effective role.

In Normandy the tactical job was to force a line, and once through that line to keep the retreating enemy so offbalance that he could at no point collect the strength to turn and confront our pursuing ground forces. The Germans were, in fact, unable to turn until we had been more

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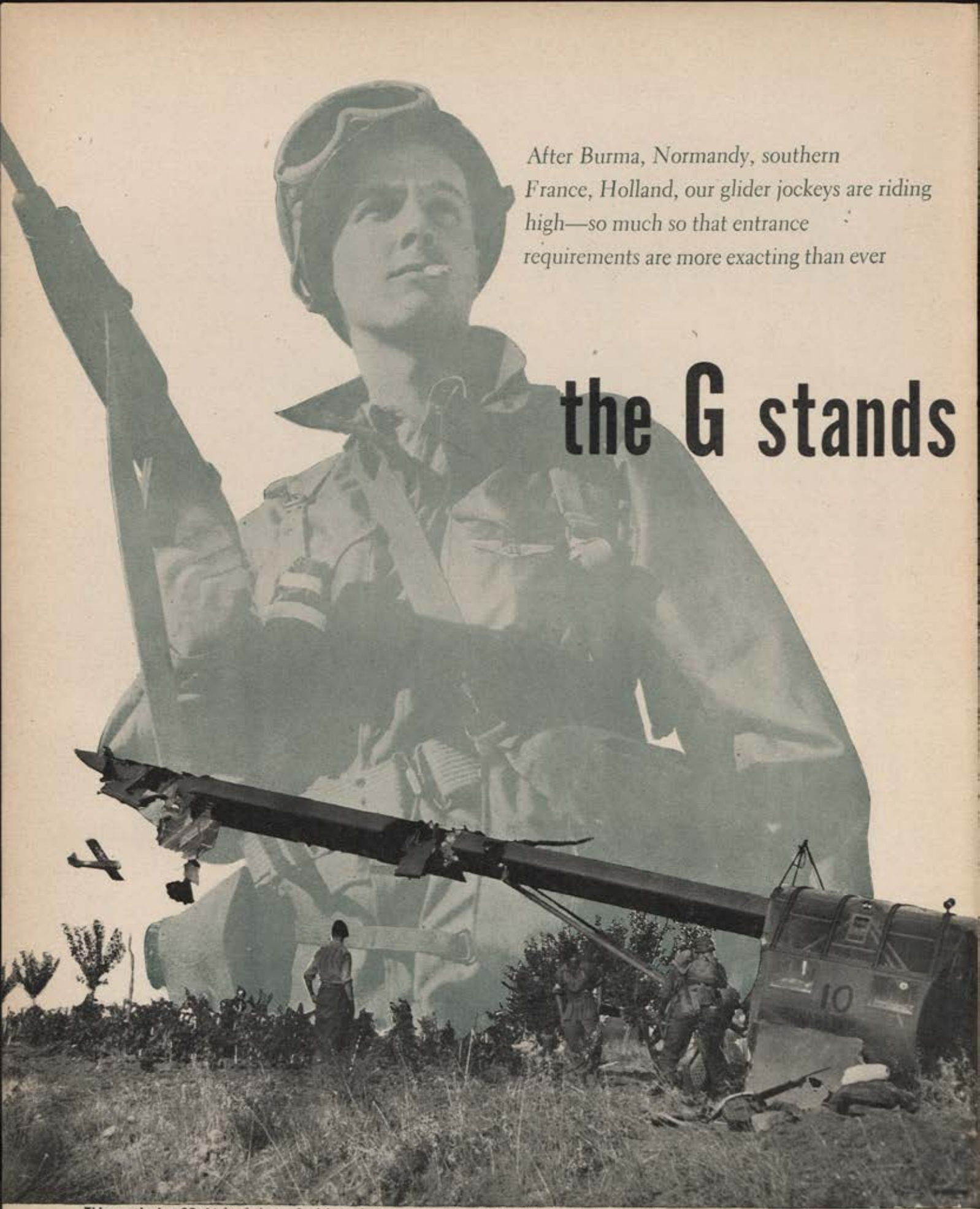
After Burma, Normandy, southern France, Holland, our glider jockeys are riding high—so much so that entrance requirements are more exacting than ever

the G stands



This particular CG-4A landed near La Motte during our invasion of southern France. Although the wing got chewed up, all hands landed safely.

for GUTS

BY MAJ. LUTHER DAVIS

AIR FORCE *Staff*

After a couple of years of being a trifle pushed around and heckled by the power plane boys, our glider pilots now have a great combat record of their own—and are beginning to feel their oats. With the successful glider shows of Burma, Normandy, southern France, Holland behind them, many who have both power and glider ratings say—as did one first lieutenant—"I'd rather wear my glider wings than my power pilot's wings any time. They mean that when the next big show starts I'll be in it—not just over it."

Among their most enthusiastic fans are the airborne infantrymen they've carried and with whom they've fought on the ground. For instance, there's one airborne captain who likes to tell people about the time in Normandy when his outfit was pinned down by German mortar fire. "We couldn't get our heads up long enough to even see where it was coming from," he said. Then they heard the rattle of small arms and next thing they knew there was no more mortar fire. Three glider pilots and a wounded paratrooper had approached the Jerries from the rear and captured the lot of them—40 some odd—with a few carbines and a grenade. "They could have just bypassed the whole affair," the infantryman said. "They'd already done plenty. We owe a lot to them and so do others I know."

A year ago our glider pilots were unknown quantities—about a dozen had taken part in the Sicilian invasion where most of the gliders were flown by British crews. Except for that they had almost no combat record until March, 1944, when they began with a bang—spearheading the invasion of Burma. Since then there's been Normandy, where 20.1% of the total material delivered to the beachhead by air was in gliders; southern France where 41.2% of Troop Carrier's deliveries were landed in CG-4As and Holland, the airborne end of which was 42% a glider show.

They've turned in combat records in the air and on the ground that make some great adventure stories. Take the official report of a flight officer who landed on the Cherbourg Peninsula on D-day: "Flak and machine gun fire were coming up heavy as we glided in and I noticed quite a few holes in the tail after getting on the ground. We started to get it from the coast in and ground fire came from all around our Landing Zone.

"We released and I made a 270° turn, but, as we approached, another glider came in right underneath us and we hit a hedgerow, knocking off our landing gear. The center of the glider buckled, pinning the jeep in, but we had no casualties.

"I took out a patrol to locate our assembly area; shells were coming from the right and there was machine pistol firing from that direction too. The Germans came toward the corner of the hedgerow where I was so I took out a grenade and threw it into the midst of them. I saw five of them fall. Then I opened up with my M-1 and got four more for sure. They threw a grenade on the edge of the bank against which I was lying and the concussion of it knocked me out. I was only semi-conscious when I opened my eyes to find a German officer standing over me with a machine pistol. He hollered 'American officer' and they took me back to a German regimental headquarters.

"While I was there a Frenchman sneaked me wine,

During our operations in Holland, this glider landed in a turnip patch. Dutch civilians helped unload the glider.

Starting our Burma invasion, a CG-4A climbs over the Chin Hills. They had to top an 8,000-ft. range of mountains.

Below: A re-supply man's view of the landing zone in Holland on September 18, 1944. The troops are elsewhere—and busy.

champagne and cognac. After a while I got a pretty good buzz on and when the German colonel came to talk to the guard in the doorway I broke out one grenade which the Germans hadn't found on me. I rolled it between the colonel and the guard, stepped behind the cement wall and waited. It killed them both all right; I took the colonel's folding carbine, map and field glasses and went out through the back door. Found a horse and rode it to behind our lines."

This is the kind of action that provided the background for a document of which the glider boys can all be proud. It's a letter written by the Commanding General of the 82nd Airborne Division from the Cherbourg Peninsula on the eighth of June—two days after D-day. At that hot moment in the history of the world, Maj. General Ridgway found time to write: "Under most difficult conditions, including landing under fire in enemy-occupied terrain, these glider pilots did a splendid job. On the ground they rendered most willing and effective service, providing local protection for the Divisional Command Post during the most critical period when the Division was under heavy attack from three sides."

A Troop Carrier team takes off from England loaded for our airborne invasion of Holland.

Rugged as their job is, glider piloting has not turned out to be the suicide mission many pessimists prophesied. The official loss rate among gliders for the toughest of our large airborne shows so far—Holland—is 7.8%, while in southern France glider losses were 2.3%. The combined glider loss for Normandy, southern France and Holland was 4.6%—which compares favorably with other kinds of combat flying.

The lack of fire hazard in a glider—no engine; no gasoline—helps account for this comparatively low casualty rate, but even more important is the flying skill of the glider pilots themselves. By using their heads at critical moments and by exercising split second judgment they have proved to be their own best friends: "The glider ahead of us made a 270° turn and proceeded to let down into a field directly in the line and umbrella of fire being sent up by enemy troops located around the edge of the field we were briefed for. Observing this fire, I made a 180° turn and landed in a soft green field nearby. Fortunately, the other boys followed me."

When you have no throttle to push forward—no way of making a second pass—a decision like that takes skill to execute. As the glider pilots have performed under fire, respect for the high caliber of technical skill required of them has grown apace. These boys have to know how to fly and from now on, by decision of the Commanding General, all officers chosen for the glider program must have checked out in twin-engined aircraft. This is the culmination of a steady increase in entrance requirements for glider training which started at 35 light plane hours, were later upped to 125—now require the twin-engine rating.

Because the glider is in—has proved itself—and because there are big plans for its employment, we need more glider pilots and need them badly. They will all be drawn directly from the Training Command which now permits newly graduated cadets who have checked-out in twin-engine planes to volunteer for gliders. Single-engine pilots who volunteer will be checked out in twin-engine aircraft before being assigned to 1 TCC.

The students go directly to I Troop Carrier Command's Laurinburg-Maxton Army Air Base in North Carolina where they're given an intensive ten weeks course. This starts with physical training, moves into infantry tactics and use of infantry weapons—M-1, machine gun, sub-machine gun, bazooka—and finally leads into glider flying proper. The students keep their flying pay during the ground phase of their training by getting time in L-4s and L-5s provided for that purpose.

When they come out of Maxton they know how to land the CG-4A under varied and difficult conditions; they know how to fly it, and they know how to fight like commandos when they hit ground. They know judo and a few tricks with knives—they're physically tough and mentally aggressive.

Almost immediately after graduation the new glider pilots are shipped—at present a 30-day lapse between graduation and shipment to a combat theater is considered abnormally long. This fact is causing many new twin-engine pilots to go into gliders rather than settle down for the long routine of transition schools, OTUs and delays in assignment which they expect as power pilots. As one eager young flight officer put it, "My brother was killed last year and I've got a job to do. I figure as a glider pilot I'll get to fight quicker—and harder."

Many of the new arrivals at Maxton are there because they believe that glider flying will improve their skill as pilots of anything, powered or not. This is borne out by the testimony of such famous power-glider pilots as Lt. Col. M. C. ("Mike") Murphy who was a stunt flyer before the war. He believes that motorless flight enormously improves a pilot's judgment of speed and distance; gives him a feel for his aircraft that plain power pilots sometimes lack. In Colonel Murphy's camp are other well known power-glider pilots such as Lt. Col. Arvid Olsen, Col. John E. Allison, both China fighter aces—and even Charles A. Lindbergh.

A rather anxious student at Maxton said he had volunteered because he believed that after the war power pilots would be "a dime a dozen." He thought that if in addition to being a qualified power pilot he had glider wings, he'd be surer of employment and be able to "get in on the ground floor" of a new industry. Glider enthusiasts talk about freight feeder lines depending on gliders for intermediate deliveries, and see great commercial possibilities for this war-developed method of flight.

These are American glider pilots being briefed for a hazardous landing in enemy-held Burma, in March 1944.

Those who volunteer for gliders have great opportunity for rank and ribbon. The T/O permits glider pilot flight leaders to be first lieutenants; glider officers in Troop Carrier squadrons, captains; in groups, majors, and in wings, lieutenant colonels. They rate both power and glider wings; usually get the Air Medal for each combat mission—and glider pilots today are sporting a lot of DFCs, Silver Stars, and Bronze Stars. Of all combat flying personnel only glider pilots rate the bronze arrowhead device to be

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Tac R

If you need some bomb-damage assessed in a hurry, or artillery fire adjusted, or lost battalions found, call on these tactical reconnaissance boys

BY S/SGT. MARK MURPHY

AIR FORCE *Overseas Staff*

When the going was rough in the Ardennes some weeks ago, Capt. E. B. Travis, who is a small slim fellow called "Blackie," was handed a job: two regiments of the 106th Infantry Division were cut off; it was necessary to find out where they were.

Blackie, a member of the 10th Reconnaissance Group, took his P-51 up into a two hundred-foot ceiling and flew the Ardennes, a mist-choked region of trees, mountains and ravines. Sometimes the Mustang whipped through a tunnel formed of ground mist below, cloud above, and snow-bent pines on either side. The plane veered through ravines, followed and skirted the contours of the hills and rocks. Travis made four such flights. No other planes were in the air and Travis went without a wingman because it was judged that the mission was so dangerous that only one aircraft and one man should be risked on it.

The last flight was made toward dusk in a ceiling varying from fifty to two hundred feet—visibility one hundred and fifty yards—and Blackie had to get down low enough to see the ground and recognize things on it; a simple matter of buzzing mountain valleys in a fog, it called for fantastically courageous flying. The two regiments were found.

This work is typical of the pilots in the tactical reconnaissance squadrons of all the TACs, the IX, the XIX and the XXIX. Their job is finding out what has happened, what is happening and what is likely to happen. They whip in and look over a bridge just after the bombers have made a run on it; they seek out enemy troop concentrations and movements; they adjust heavy artillery fire; or stooge around over enemy territory and lead Thunderbolt squadrons to targets they have found.

Capt. Edward L. Bishop landed one recent Sunday after spending what is considered in Tac R circles a good few hours. He was over a small town in Germany adjusting artillery fire, when he saw some tanks moving into the town a little out of range of effective heavy gun fire. He called for some P-47s, and when a squadron showed up some minutes later he led them to the tanks.

The squadron went down toward the tanks, but flak from the town drove them from the bombing run. Bishop got in touch with the artillery fire direction post and gave it the positions of the flak batteries. The artillery let go, and the Germans at the AA guns ran for their foxholes. While they were in them the Thunderbolts nosed down and bombed the tanks. Bishop and the P-47 leader gave the enemy time enough to get back to their gun positions and called for artillery again. The shells hit the flak positions; the gunners ran, and the 47s came down and beat up the tanks with armor piercing incendiaries. The tanks were stopped, the Thunderbolts went home. Bishop got the artillery pin-pointed and then flew on to his other work, which was finding out what the enemy was doing in a certain section in Germany.

Although Tac R fellows see little glamor in their jobs, they are the objects of considerable admiration from other pilots, ground controllers and members of the ground forces. "We think they're wonderful," one rather unrestrained infantry G2 said. They fly in pairs in almost any kind of weather, frequently indulging in an odd maneuver called "jinking." This is visual reconnaissance performed while the number one man weaves along up on one wing and then the other, while the number two man trails him in slightly more level flight. Number one watches the ground continually while the wingman protects the flight by watching the sky. Tac R pilots are superb recognition experts. They know German, American, British and French armor, planes, motor and horsedrawn vehicles—a little better, probably, than the men who write the manuals—and they can recognize any of it while doing a buzz job at 350 mph.

They are not supposed to fight enemy planes, their job being a tactical one of high importance, but as one fellow (an ace) said, "You just can't go and leave an ME109 stooging around. He's likely to get on your neck. So we use active defense." The 10th Group which does day and night photo reconnaissance as well as Tac R got 40 planes last year. Purely in defense, of course.

The pilots are forbidden to do any strafing, but there have been cases. "You train a pilot to be a fighting son of a gun.

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THE AAF LOOKS AHEAD

BY GENERAL OF THE ARMY H. H. ARNOLD

Commanding General, Army Air Forces

In his second wartime report to the Secretary of War, just published, the Commanding General evaluates some important lessons learned by the AAF in three years of war. Explaining that it is impossible to cover all of these lessons in detail and that new ones are being learned every day, General Arnold sets forth certain basic principles regarding airpower and the long-time security of the nation. These principles are stated in 12 major points, as follows:

✈ Airpower is the weapon by which the aggressor in this war first struck and with which future aggressors will strike. The range, speed and destructive capacity of a powerful air force is such that, given sufficient air superiority, the aggressor can by sudden action disrupt the life of the attacked nation and make difficult the taking of defense measures. Moreover, in this field which the present war has shown to be subject to revolutionary advances, we can only dimly visualize the possibilities of such sudden action in the future.

✈ We must recognize that the only certain protection against such aggression is the ability to meet and overcome it before the aggressor can strike the first blow. In the past, such blows were waterborne; traditional naval power was our first line of defense. From now on successful aggression must come by air. The defense lies in adequate airpower with all its manifestations, and our first line of defense must be in the air.

✈ The foregoing principles can mean only one thing to the United States. In two world wars, the aggressor has moved first against other peace-loving nations, hoping that the United States would remain aloof, or that other nations could be defeated before this country's power on land, sea and air could be brought to bear against him. Luckily, in each war there has been time for the mobilization of such power, and the United States has been the determining factor in the defense of civilization. The lesson is too plain for the next aggressor to miss: The United States will be his first target. There will be no opportunity for our gradual mobilization—no chance to rely on the efforts of others. It is of the utmost importance that our first line of defense, in the air, must be ably manned and fully supplied with modern equipment. We must be able to provide time for other parts of the national defense machine to mobilize and go into high gear. The United States must be the world's first power in military aviation.

✈ Airpower and air supremacy are terms which require careful definition. Their full significance must be understood by the American people. The nation must also understand that, due to the revolutionary developments of science and the world's inventive genius, they may have entirely different meanings for successive generations or within any short span of years. In 1918 airpower was built around the Spad, the Handley Page, the Gotha, and the Caproni. In 1944 Allied airpower was built around the Spitfire, the P-51, the P-47, the Hurricane, the P-38, the C-47, the B-17, the Lancaster, the B-24, the B-29 and others. In 1945 or 1946 it may mean other as yet undisclosed types. In 1952 it may mean far different equipment with destructive power and accuracy of which man has not yet dreamed.

✈ Thus, the first essential of the airpower necessary for our national security is preeminence in research. The imagination and inventive genius of our people—in industry, in the universities, in the armed services, and throughout the nation—must have free play, incentive and every encouragement. American air superiority in this war has resulted in large measure from the mobilization and constant application of our scientific resources.

Comprehensive research, both within and without the air services must be expressed in inclusive and continuing programs. Only in this way can our air forces reflect at all times the rapid advances in aerodynamics, physics, chemis-

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THIS IS YOUR ENEMY

. . . it's your life or his

Geschwindigkeit Is Right. A good many American airmen have recently met their first German jet planes in combat. For some time reconnaissance pilots have been reporting the ME262, a more recent acquaintance than the ME163. Fighter pilots and bomber crews have now had their say about the ME262. In a wink it has sometimes been mistaken for a P-38 or a P-51 but recognition is usually instantaneous. As for speed, it blazes along all right—well over 500.

Lightning vs. ME262

The ME262 standard trick is the classic attack out of the sun. Its typical dive is shallow, its standard turn wide. Against bomber formations it slants through at tremendous speed adopting hit and run tactics. It has recently taken on fighter escort. Besides its employment as a fighter it has carried out the same kind of low level attack as the ME163 and is being used to bomb targets of immediate tactical importance.

The Germans have not left all the talking about this plane to allied pilots. Sometime ago Berlin newspapers celebrated it under the name "Blitzbomber." Recently a widely distributed German pamphlet carried this description "BLITZBOMBER hohe Geschwindigkeit dabei starkes Rauschen mit Pfeifton" (high speed accompanied by a loud whistling sound). American pilots don't bother about the whistle but they add "Geschwindigkeit, brother, is right"

Puzzle Solved. Not long ago the 13th Air Force was considerably annoyed by Japanese planes that came in low at night and dropped bombs on airstrips before the Americans had a chance to detect them. Location of the Jap home base was a puzzle. One day the crew of a B-24 out of formation south of Morotai noticed the coconut palms walking like men. It turned out that the Japs had a field in the Halmaheras, hidden by palms on sleds. At night the palms would be dragged away, and there was an airstrip. Repeat, there was an airstrip.

More Smoke. To difficulties which Germany has been able to put in the way of the AAF, add more effective smoke screens. Here's the confirmed score for each January since the war began: 1942, 2; 1943, 10; 1944, 38; 1945, 74. Screens are usually produced by generators consisting of metal drums of 40 gallons of "chlorofonsaure." Effective density is achieved in about 20 minutes. If possible the Germans start the smoke about half an hour before an attack. Crews manning the equipment are often non-Germans; whole smoke companies have been imported from Italy. Screens can be expected on clear nights. Fake screens in wasteland and multiple screens near an important target are sometimes used as decoys. Germany has lately relied more on quantity of smoke than on tricks, however.

The Japanese have also increased their tactical use of smoke. One bomber crew over Manchuria reported that target areas were quickly obscured. The smoke did not prevent effective bombing, but it hampered visual observation. For this kind of difficulty, there is the compensation that efficiency of antiaircraft fire usually decreases in the presence of a smoke screen.

As Matsuzaki Sees Us. Domei's correspondent, Matsuzaki, covering front-line bases in Luzon has informed his Oriental readers that the United States has begun to use pilots "about 45 years old." The sight of them, he says, causes Japanese to exclaim in astonishment, "What old soldiers!" Members of the Imperial Army were also astonished, Matsuzaki adds, by the discovery that B-24s were carrying women members of the crew. He concludes, without exclamation,

"Judging from the way women are used in England as members of the air defense corps and as tank crew members, and from the way pilots 45 years old and even women crew members have been sent by the United States to the decisive battlefields of the Philippines, we conclude the enemy's serious manpower shortage."

One FW Is Missing. The most embarrassed flyer in the GAF is the pilot of a "long-nosed" FW 190. During one of the Luftwaffe's recent attacks in force, this pilot made a steep dive on a light AA position. The gunners put everything up the barrel. As the German came out of the dive, his engine cut out. The FW was dead. With great skill the pilot made a belly landing. He was surrounded and captured, his plane taken as a first-rate military windfall. But as the triple-A battery was about to chalk up one more victory, technical intelligence concluded that credit really belonged to a partridge, nationality unknown, which had hit the coolant radiator, making a hole several inches in diameter.

Wooden Bullets. Talk about German wooden bullets simmered down considerably after United States experts reported for the Air Technical Service Command. The wooden bullets made their appearance on D-day, and large batches were left behind by retreating Nazis. Tested, these gadgets proved less dangerous than peashooters. At two feet, they will pierce an ordinary piece of paper. At five feet, they hit the paper and plop to the ground. Their maximum range is 15 feet. Muzzle velocity is droopy. Speculation about the use of these bullets because of "lack of metal" has given way to the calmer opinion that the missiles were merely leftovers from field maneuvers in Normandy at the time of the invasion.

Jap Dummy Planes. As early as the autumn of 1942, bomber crews reported that the Japanese were using dummy aircraft to mislead our attacking planes. The dummies were not seen in any great number, however, until Japan began to withdraw up the Pacific. Then, on numerous islands, crude makeshifts or painted outlines were found. More recently, dummies have been sighted or captured in larger numbers. Their quality is excellent. They are made with care; propellers have been added and canopies finished so as to deceive low-flying planes. Generally, the dummies are raised in front to imitate the appearance of operational aircraft. Sometimes they are lined up in normal patterns to attract attackers away from profitable targets. Occasionally they are bunched near concealed antiaircraft positions as decoys for the Japanese AA gunners.

German "Work" Planes. German transport planes have come back into the recognition picture. AAF units moving up close to the Reich and those in German air are seeing more and more of the "workers." The tri-motored JU52, old reliable of the Luftwaffe, is still around. The ME323, first cousin of the glider ME321, pounds along on six engines. Of the newer transports, the Arado AR232, high-winged, high-tailed, thin-boomed, appears in twin and four-engine versions. ME109s and FW190s, and the other German combat craft have rated more talk during the war, but the German Air Ministry sounded serious not long ago when it delivered special commendations for "Pilots and planes that get troops and fighting equipment to and from the front."

Jap Armament. A powered gun turret and powered gun mount developed by the Japanese have been reported from the Pacific. The turret generally carries a 20 mm cannon, but it may also be fitted with the 12.7 and 13 mm machine gun. The gun mount carries either 7.7 or 7.9 machine guns. Both turret and gun are operated hydraulically. The single-hand lever turret control usually requires the operator to be at or near the installation, although in some planes—the Irving, for example—the mount is remotely controlled.

The Road Back. The Japanese philosophy by which the individual is canceled out for the sake of the state has been illustrated often enough in combat. No official Japanese statement has given more solemn expression of this attitude toward war than a training directive which includes instructions to soldiers taken prisoner:

For unwounded personnel, the only alternatives are death or escape. Before dying, the Nipponese fighter is expected to strike a blow against the enemy. He is warned especially that kind treatment by captors and anti-war doctrines are subversive to his honor.

For the prisoner who escapes, the future is grim. He is directed to collect as much information about the enemy as possible and report to his superior officers. After return to his ranks, the ex-PW must "realize his misdeed, show penitence, make a full statement, and await the decision of his superiors." He still has a chance to "wipe out the humiliation and cleanse his disgrace by death in combat" if he is an enlisted man; if he is an officer, the recommended course is suicide.

The directive leaves no room for compromise: "Although there are sympathetic feelings against persons who have fallen into enemy hands due to severe wounds, no matter what the excuse may be, it is the utmost disgrace to be captured alive."

Conversation. Lieutenant General Tatekawa, director of one of the Japanese youth groups, has issued instructions on "loyal conversation." If a true loyalist hears somebody say, "Japanese Fleet does not show up. Where is it?" and somebody else reply, "My guess is that it has been defeated," the loyalist's comment should be, "Fleet? Fleet is still intact. It watches gloatingly for opportunities to strike."

If that bit of repartee isn't successful, the loyal conversationalist is to add, "Besides, warships are not the deciding factor in present naval warfare."

To complaints that "aircraft production may be great, but half the planes are useless," the loyal answer must be, "Government admits a few planes are useless; but half of them—that's absurd." The suggested tag-line here makes some sense: "If we can manufacture enough planes, we can win."

Tatekawa's conclusion to all this loyal repartee is that men can be trained to "grab any man with wrong ideas, hold him by the arm," and correct his thinking.

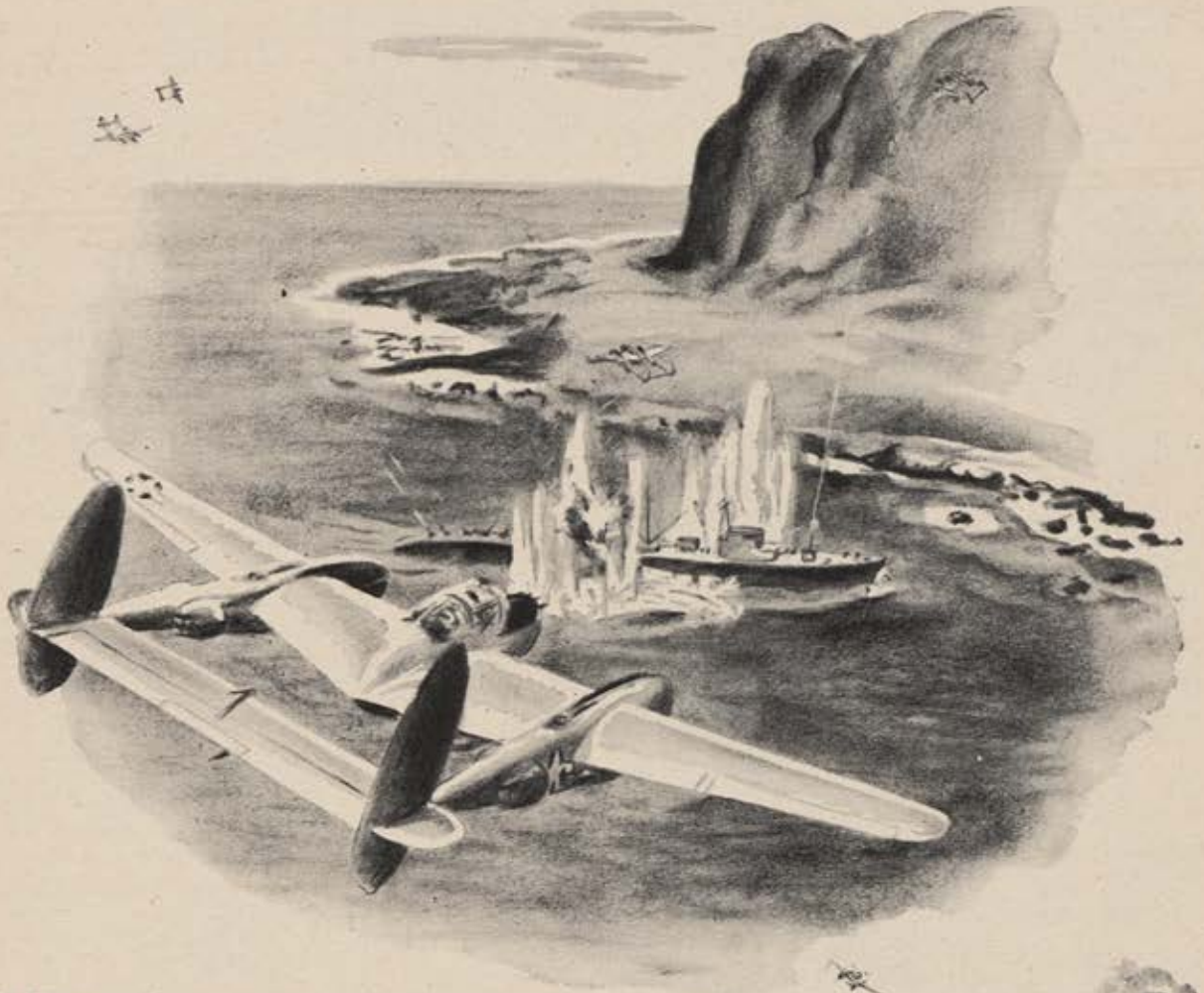
Then, as a mild cynic has suggested, if the thinking is too hard to correct, you can always twist the arm.

Ace of Aces. Hitler has created the fanciest of all decorations, and a flyer is the first to win it. The new symbol of valor, to be awarded to only one dozen men, is called the "Golden Oakleaves with Swords and Diamonds to the Ritterkreuz." Hans Ulrich Udel, the Luftwaffe's "Ace of Aces," is the first recipient. Udel commands S.G. 2, which bears the name of the famous Immelmann. Flying on the Eastern Front, he is said to have put 16 Russian tanks out of action within a few days. ☆

Strike at Iwo Jima

P-38s strike at Iwo Jima—7th Air Force P-38s based on Saipan, 750 wet miles away. The accompanying sketches were made by AIR FORCE staff artist, Capt. Raymond Creekmore, who rode in a B-29 acting as navigation plane for the mission. Since last August, the 7th has raided Iwo Jima almost daily, dropping over 4,600 tons of bombs on the 12½ square miles of volcanic island, and the 21st Bomber Command has added more than 1,000 additional tons. The reason—Iwo Jima has two airfields and is midway between Guam and Tokyo. A very strategic island.

P-38 piloted by Maj. W. Roeser exploded a Nick's right auxiliary gasoline tank, and caused another explosion in the Nick's left wing root: One Nick, confirmed.



All the fighters made repeated passes at a Jap Naval Transport (APD) lying offshore. The vessel put up a lot of heavy automatic rifle fire which slightly damaged one P-38, but the fighters kept plugging at the superstructure, bridge, and waterline. When last seen the ship had been beached to prevent sinking and three fires were burning amidship. The rifle fire had stopped.

Three Zekes were found neatly parked, wingtip to wingtip. They were thoroughly strafed by 1st Lt. James Devonker, and the plane in the middle exploded, probably setting fire to the other two Zekes. Everybody came down on the deck—including the B-29—and soon there were many fires in dispersal areas, bomb dumps, and unidentified buildings. All our planes returned to base.

SNOOPERS

By Air Force *Overseas Staff Correspondents*

ILLUSTRATED BY FIRST LT. NORMAN F. TODHUNTER

A crew of the B-24 "Snoopers" is being briefed. Weather and other factors pertinent to a long over-water flight are covered in detail. Then comes the payoff—target and mission for tonight.

"We believe," says the intelligence officer, "that the Japs must be staging their raids on our Leyte forces through airfields on Cebu Island. That is your target—every airfield you can find on Cebu. And your mission: to heckle the hell out of them all night long. That will be all, gentlemen."

With that laconic instruction, the Snooper crew is on its own. The real briefing takes place within the B-24 as it gains altitude over the Celebes Sea; the mission is planned, decisions made, tactics evolved by the crew itself. Pilot, navigator, bombardier, electronics operator, all make their contributions to the plan of operations that will be translated into action by the superhuman Snooper devices, equipment that enables their plane to navigate unerringly across a thousand miles of open sea and weather, through the blanket of night, to spot a blacked-out, invisible target with the sureness of a thoroughbred pointer.

The Snoopers of the 13th Air Force in the Southwest Pacific are individualists, whether their mission is sea search, shipping attack, or the blasting of enemy airfields. They are wolves of the night, hunting alone, as against the pack tactics of their daylight brothers who fly formation.

This type of operation was born as a project of Lt. Gen. George C. Kenney back in the days of the Bismarck Sea.

The Snoopers, one of these units now operating with the Far East Air Forces, did not attain the maturity of a per-

The "Snoopers" of the Far East Air Forces have a unique method of making life miserable for the Japs—after dark

manent status until early 1944. Since then, like bats out of hell, their nocturnal B-24s and those of a similar outfit with the 5th Air Force have haunted the Japs from New Ireland to the Netherland East Indies, from Palau to the Philippines, have tormented Truk, bedevilled Borneo, walloped Woleai, struck shipping from battleships to barges.

Like huge, purring cats in the night, they pounce upon their prey without warning. Their eyes are a low altitude bombsight that sees in the dark far better than human eyes have ever seen in the daytime, enabling the Snoopers to come in undetected by the enemy and strike at an altitude of 1,500 feet or less, an altitude that makes the daylight boys shudder.

Snooping is hard work. Missions of the 13th Air Force Snoopers (who claim the global copyright to the name) are 2,000 miles and more over open water, without fighter escort; duration of missions varies from 10 to 18 hours in the air, is limited only by their gas supply. With their special electronic detecting, navigating and bombing devices, heavy bomb loads and maximum gas load, B-24 Snoopers carry more than 10,000 pounds in excess of the plane's designed load capacity.

Maj. James D. Barlow, of Oakland, Calif., former B-25 pilot and commanding officer of the Snoopers, explains that the outfit has had to adapt itself and its technique to fit the tactical situation, sometimes almost overnight. They have switched from shipping to land targets and back to shipping. A similar method of locating the invisible targets is used for attacking both shipping and land targets. The latter, however, does not permit as great accuracy in bombing, is more often of the "keep the Jap awake and alerted" variety.

By choice, shipping attacks are the favorite Snooper vocation. There is a definite satisfaction, they say, in being out there in the night, all on your own, sighting the target from 30 or more miles away, figuring out for yourself the best method of approach and attack, the challenge of closing in undetected on the victim, making the kill unassisted.

Every mission presents a new and different problem to be solved. Their target is an unknown quantity and may vary from a Sugar Charlie to large transports, cruisers, destroyers or battleships; each one requires a different technique. The ship may be alone or in convoy, it may be capable of sudden evasive action, possess an unexpected potential of firepower. As each mission is performed by an individual plane, it calls for extraordinary initiative on the part of each crew, the closest cooperation. Within each Snooper crew must exist the essence of teamwork.

Considerable research and practice went into the development of the Snooper—which has been referred to by the Japs as "the plane with a thousand eyes." Credit for much of the pioneering must go to Col. Stuart O. Wright, who in 1942 rounded up some veterans from the old First Sea Search Attack group and formed the first Snooper squadron.

First they tried out the new equipment while hunting enemy subs. Then came months of additional testing at Eglin Field. Finally in the summer of 1943 they decided they were ready. In August of that year, the first squadron of Snoopers arrived in the Pacific and joined the 13th Bomber Command.

In those days the Japs were convinced they could hold the Solomons for a long time. We had fairly good control of the sky in daylight but at night Jap surface vessels could shift men and supplies from one island to another with little chance of detection.

But on the night of August 23, 1943, we gave the enemy one more indication that this war was going to be fought according to our time table and under our conditions.

Two Jap destroyers slipped out of their hidden harbors and moved into the slot that runs all the way up the Solomons between Santa Isabel and New Georgia. They were going to evacuate some troops from Kolombangara and Vella Lavella.

We knew they were coming. They had been doing this regularly for it had been almost impossible to intercept them due to treacherous waters and the darkness of night.

Confident that nothing could stop them, the men on those Jap destroyers probably didn't pay much attention to the drone of an airplane in the black skies above them. If they thought about it at all they probably figured that the Americans must be desperate to waste gasoline and airplanes in such darkness.

Suddenly several bombs rocketed down as if they were released along an invisible line connecting the plane with the ships. As they hit squarely on the destroyers they tore the night apart. The airplane made two bomb runs and each time scored direct hits.

This was the first Snooper mission and a highly successful one. But the Japs evidently thought that precision bombing after sundown was purely a matter of luck. They continued to send shipping down the slot at night.

This refusal to face realities proved costly for the Japs on the night of September 29, 1943. In Snooper annals, this date is known as "the night of the Tokyo Express." On that night 11 enemy ships steamed down the slot to evacuate their men from Kolombangara.

The Snoopers were expecting them. They had six planes up and every entrance and exit in the slot was covered.

There is little twilight in the tropics and the darkness closes in quickly. It was just a few minutes before the last faint rays of the setting sun had vanished from the western horizon that the Snoopers caught the Jap convoy in Bougainville Strait.

By the time the battle was joined, it was completely dark but the Snooper crews could see their hits. Five distinct

fires flared up from five of their targets. One ship blazed like a candle in a closet before capsizing.

In the early morning the action finally was broken off. The Jap formation turned—what was left of it—and retreated back to its base. The enemy had used every means available to break through the aerial blockade. Their anti-aircraft fire was heavy and one of the Snoopers went down. But the Snoopers again had proved themselves.

As time went on, the Snoopers expanded the radius of their patrols alert for anything that moved below.

Perhaps the largest single victory for a Snooper plane occurred when one of them spotted a Jap aircraft carrier attempting to ferry fighter plane reinforcements to one of the battlefronts. This Snooper caught the flat top just off Buka passage and scored three direct hits. The next day there was little fighter opposition when our bombers came over Kahili and Bonis airdromes. The carrier later was detected in Simpson Harbor of Rabaul being patched up.

A Snooper mission generally will cover well over 2,000 miles and nothing is too small to escape attention. Admiral Halsey, Commander of the South Pacific, said he was gratified with "the manner in which your searchers and Snoopers put the hot foot to shacks, barges and even canoes."

One day a Snooper caught a Jap submarine between Bougainville and New Britain. The sub went down—or so the Snooper reported. But the next day a search plane found it on the surface in exactly the same spot where the Snooper reported bombing it. The sub didn't move. It just dove whenever one of our planes appeared. And judging from the frantic work going on aboard, it was apparent that the Snooper had wrecked everything on the sub but its ability to surface and submerge. For the next three days "Bob and Joe," as the sub was affectionately called, was the delight of every plane that passed. All tried to catch it on the surface, but a destroyer finally sank it.

Then there is the story of one of our own subs that had been stalking a merchant vessel. Just as it was moving into position to let go a torpedo a string of bombs came out of the sky and the Jap merchantman went up in flames. The sub commander complained bitterly when he put into port and learned that a Snooper had beaten him to his prey.

One of the most important factors in the success of a mission is weather. Due to the length of Snooper missions, which makes every drop of gas count, they cannot afford to fly around weather but must go through it.

Lt. Clayton F. Seavers, of Cleveland, Ohio, a veteran Snooper navigator, tells of a new navigator he was breaking in on the electronic navigating equipment during a practice mission. When a bunch of weather was sighted ahead, Seavers let the neophyte solve the problem his own way, which was simply to go some 100 miles off course to skirt the turbulence.

The new navigator was quite proud of himself until Seavers explained that if it had been a combat mission, that extra 100 miles would have exhausted their gas supply many miles short of home base. He left it to the other navigator's imagination to figure out the fate of a heavily over-loaded B-24 and its crew in a crash landing. It is possible to get out, but there are easier ways to complete a tour of duty.

The new navigator listened, but was not convinced that the electronic navigating device could have done any better, could have taken them safely through the weather. Seavers bided his time; it came on the next combat mission. A few hours out, bad weather was indicated some time before it actually was visible in the sky. Seavers saw that it was bad, and so did the new navigator.

"We've got to go around it," said the new navigator.

"We can't afford the gas," countered Seavers.

"Then we'll have to turn back," said the new navigator.

"Snoopers don't turn back because of rough weather," said Lt. S.

"Then what do Snoopers do?"

"Find the safety zones on the equipment and weave their way through the weather. Go ahead, try it."

"All right," said the new navigator dubiously, but settling down to work. He became engrossed and fascinated as he picked his way along, shouting instructions to the pilot. Then the blackest and biggest front he had ever seen in the sky or textbooks loomed up ahead, and he hesitated.

"Go ahead, you're doing fine," encouraged Seavers.

When the B-24 pushed along and squeezed through a narrow space between two perilous fronts to emerge into a clear sky, no one drew a deeper sigh of relief than Seavers. He didn't tell the new navigator that it was a miracle that there had been that opening and more so that they had found their way through it. He did know that the new navigator had been sold on Snooper ways and was one of them.

Selling Snooper ways to new crews is an old story to the veterans. New crews listen to lectures, are exposed to practical demonstrations, read reports of successful employment of the special technique. More often than not they are decidedly suspicious of the low 1,500-foot bombing altitude, consider the electronic devices so many fancy gadgets, insist that navigation is navigation and not a mysterious interpretation of lights and shadows on a screen. So, they do it their own way. Their bombs splash harmlessly wide of the target they "had in the bag." Then they start wondering if they know it all. And that is what the veterans have been waiting for.

"Look here," they say. "You've tried it your way and washed out. Now why not try it the Snooper way?"

"That's all right for you to say," is the retort. "You've completed your missions, sunk your ships and waiting to go home."

"Well, isn't that proof enough that it works?"

That usually hits home. "OK, we'll give it a try your way."

Once is enough. To paraphrase an automobile manufacturer's sales slogan, the evidence of the effectiveness of Snooper tactics is to "ask a crew that has tried it." It gets in the blood. The hunting instinct is aroused. To get a ship becomes an obsession.

Time after time, bombardiers who have an enviable record of bombing land targets behind them seek out Capt. Fred S. Howell, of Jerseyville, Ill., in charge of Snooper electronic equipment and development, to ask for help.

"I've almost finished my missions," pleaded one, "and I haven't gotten a ship yet. You know, captain, I'd be one hell of a Snooper to go back home without at least one Jap ship to my credit."

The captain, a dyed-in-the-wool Snooper, understands. He coaches the bombardiers in all the fine points and tricks of the plane's special equipment. In fact, there are those who say that Captain Howell deserves a share of the credit for every ship the outfit sinks.

This passion for going after Jap ships, small and large, in any number, sometimes backfires. Take the case of the Snooper plane on which Lt. Charles W. Binford, of Michaux, Va., was pilot, and Lt. James L. Lockwood, of Hampton, Va., navigator.

"We were out over the Sulu Sea on a sea search," began Lieutenant Lockwood. "That means we weren't carrying bombs, just a pile of gas."

"Our job," cut in Lieutenant Binford, "was to report something the brass hats call the 'trend of Jap shipping,' whatever that is."

"Well, anyhow," continued Lockwood, "it was the night

(*Continued on Page 60*)

Proud Partisan stands guard over B-24 that made forced landing. Partisans are always eager to help.

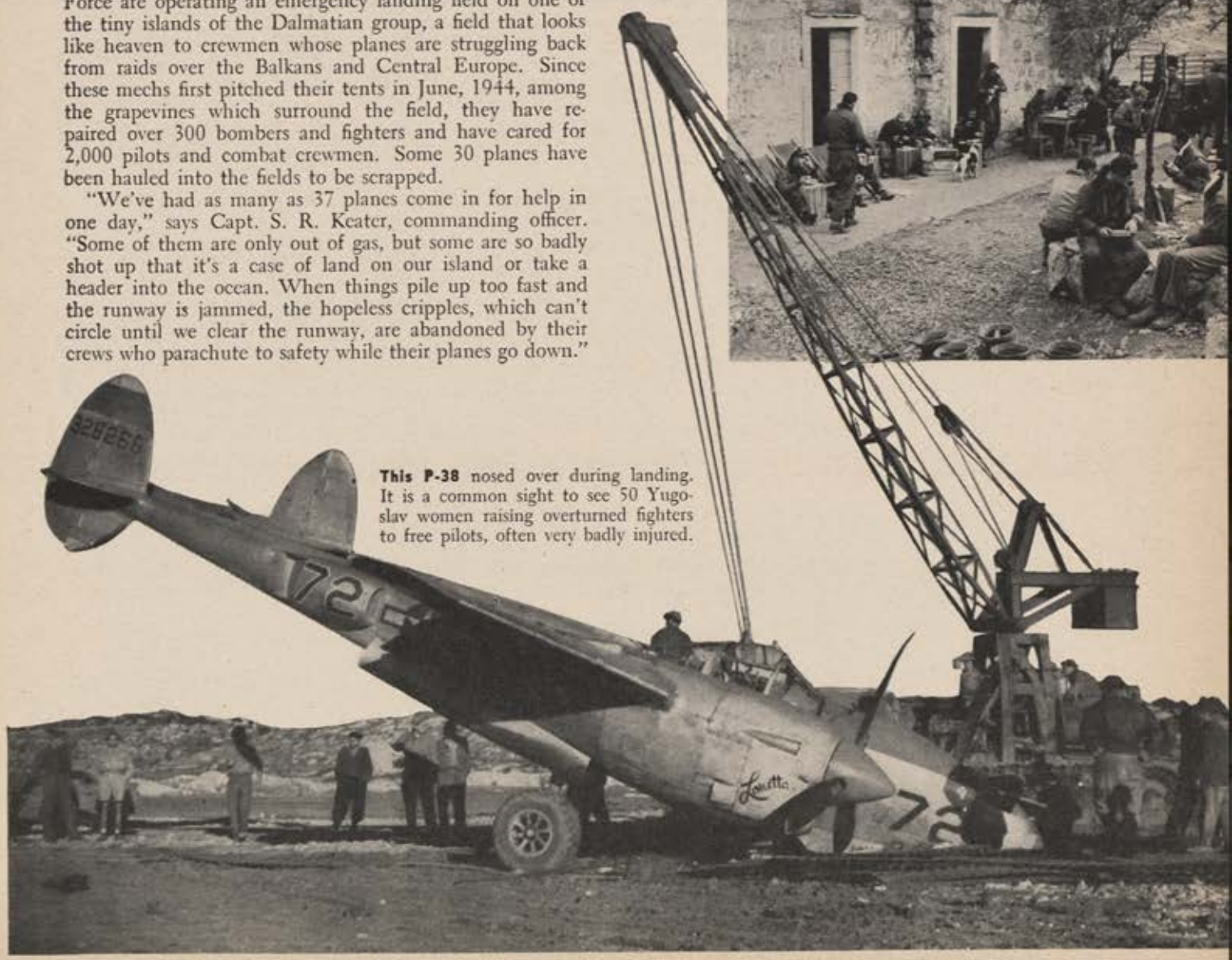
Working conditions are primitive. There are no shops, no hangars, no cemented taxiways and all work is done under the open sky and in the mud, as photo shows.

A BIT OF HEAVEN

A handful of grimy, grizzled mechs of the 15th Air Force are operating an emergency landing field on one of the tiny islands of the Dalmatian group, a field that looks like heaven to crewmen whose planes are struggling back from raids over the Balkans and Central Europe. Since these mechs first pitched their tents in June, 1944, among the grapevines which surround the field, they have repaired over 300 bombers and fighters and have cared for 2,000 pilots and combat crewmen. Some 30 planes have been hauled into the fields to be scrapped.

"We've had as many as 37 planes come in for help in one day," says Capt. S. R. Keater, commanding officer. "Some of them are only out of gas, but some are so badly shot up that it's a case of land on our island or take a header into the ocean. When things pile up too fast and the runway is jammed, the hopeless cripples, which can't circle until we clear the runway, are abandoned by their crews who parachute to safety while their planes go down."

This two-story stone farmhouse serves as headquarters building. Men live in nearby port town.



This P-38 nosed over during landing. It is a common sight to see 50 Yugoslav women raising overturned fighters to free pilots, often very badly injured.

BATTLE HONORS

Out of the bitter air battles of the last three years have come stories of heroism and triumph unsurpassed in the annals of warfare. Here AIR FORCE presents a chronology of the AAF units which have received Distinguished Unit Citations "in the name of the President as public evidence of deserved honor and distinction." The chronology includes citations officially recorded at Headquarters AAF up to January 1, 1945, except those which cannot be revealed for security reasons. In the future, AIR FORCE plans to report in somewhat more detail each citation as it is recorded.

The brief summaries of the actions are presented in the wording of the original citations as published in General Orders of the War Department. It may be pointed out that almost invariably the citations acknowledge the contribution of the ground echelon to the success of the combat achievement. Units that have been cited more than once are entered at the appropriate dates for the various citations.

The Distinguished Unit Citation should not be confused with the Presidential Unit Citation, the group award of the United States Navy. Both are awarded in the name of the President. The Army, however, has not borrowed the name of the Naval award, and the ribbons are different. The Army's ribbon is the familiar dark blue bordered in gold. Personnel assigned or attached to the organization and physically present and at a normal post of duty with that organization on the occasion or at any time during the period for which the citation was made may wear the Distinguished Unit Citation ribbon.

FAR EASTERN AIR FORCE Dec. 8-22, '41
Engaged an enemy greatly superior in numbers and inflicted damage far out of proportion to its meager means, during first weeks of war in the Philippine Islands.

19TH BOMBARDMENT GROUP (H) Jan. 1—Mar. 1, '42
Participated daily in attacking the enemy wherever they found him during his prolonged drive through the Philippines and Netherland Indies to Java.

5TH INTERCEPTOR COMMAND Jan. 6, '42—Mar. 8, '42
Made a major contribution to the prolonged defense of Bataan and Corregidor by carrying out hazardous reconnaissance missions and attacking ground, air and naval elements of the enemy.

7TH BOMBARDMENT GROUP (H) Jan. 14—Mar. 1, '42
Same citation as 19th Bombardment Group.

17TH PURSUIT SQUADRON (PROVISIONAL) Jan. 14—Mar. 1, '42
Repeatedly entered into combat against a numerically superior enemy during the defense of Java and other South Pacific islands.

49TH FIGHTER GROUP Mar. 14—Aug. 25, '42
Defended area near Darwin, Australia, though greatly outnumbered by enemy aircraft, and took toll far out of proportion to its own losses.

376TH BOMBARDMENT GROUP (H) May, '42—Aug. '43
Conducted the first U. S. air combat operations in the defense of the then threatened Suez Canal area and later in support of the British 8th Army.

PAPUAN FORCES, U. S. ARMY, SW PACIFIC (AIR UNITS) July 23, '42—Jan. 23, '43
Made possible the success of the ground operations which repulsed the Japanese drive against Port Moresby, by attacking enemy ground forces and convoys, and by transporting to, and supplying our forces in, the jungle.

11TH BOMBARDMENT GROUP (H) July 31—Nov. 30, '42
Participated continually in attacking the enemy in his efforts to

obtain stronger foothold on South Pacific strategic territories.

98TH BOMBARDMENT GROUP (H) Aug. '42—Aug. '43
Rendered an invaluable contribution to the success of our Allied forces from the beginning of the Middle East campaign to the capitulation of Sicily.

19TH BOMBARDMENT GROUP (H) Aug. 7-12, '42
Performed repeated long-range bombing attacks on heavily defended enemy airdromes and shipping in the vicinity of Rabaul (during the invasion of Guadalcanal).

435TH BOMBARDMENT SQUADRON (19TH BOMBARDMENT GROUP) (H) Sept. 10—Oct. 10, '42
Performed repeated long-range reconnaissance and photographic missions with unescorted single B-17E type airplanes over hostile areas in New Guinea, New Britain and the Solomon Islands.

374TH TROOP CARRIER GROUP Sept. 19—Dec. 22, '42
Utilized various types of unarmed aircraft to supply ground troops and evacuate casualties during the Papuan campaign.

301ST BOMBARDMENT GROUP (H) Apr. 6, '43
Struck a decisive and crippling blow at a critical point in the battle for Tunisia by destroying an enemy convoy in Bizerte Harbor.

57TH FIGHTER GROUP (S) Apr. 18, '43
Participated in the destruction of 72 enemy aircraft including 58 transports carrying reinforcements to Northern Tunisia.

314TH FIGHTER SQUADRON (324TH FIGHTER GROUP) (S) Apr. 18, '43
Same citation as 57th Fighter Group (S).

44TH BOMBARDMENT GROUP (H) AND HQS. 66TH, 67TH AND 506TH BOMBARDMENT SQUADRONS May 14, '43
Successfully fulfilled hazardous mission of dropping incendiaries on naval installations at Kiel, Germany, after lead group had released high explosive bombs.

99TH BOMBARDMENT GROUP (H) July 5, '43
Played a major part in preparing the invasion of Sicily by heavy

12TH BOMBARDMENT GROUP (M) Oct. 23, '42—Aug. '43
Contributed greatly to the defeat of the enemy in the Middle East while operating in direct support of the British 8th Army.

57TH FIGHTER GROUP (S) Oct. 23, '42—Aug. '43
Same citation as 12th Bombardment Group (M).

480TH ANTISUBMARINE GROUP Nov. 10, '42—Oct. 28, '43
Led Army Air Forces in the fight against the U-boat, carrying the offensive to the home waters of the enemy.

2ND TROOP CARRIER SQUADRON Jan. 26—Dec. 31, '43
Operated its aircraft over some of the world's most rugged terrain performing vital transport and food dropping missions in CBI.

9TH COMBAT CAMERA UNIT Feb.—Aug. '43
Participated in long and dangerous flights over enemy territory in the Middle East theater to bring back vital documentary photographs.

340TH BOMBARDMENT GROUP (M) Mar.—Aug. '43
Contributed directly to the expulsion of the Axis powers from Africa and Sicily by bombardment attacks on airdromes, supply lines and ground units of the enemy.

79TH FIGHTER GROUP (S) Mar.—Aug. '43
Made invaluable contributions to the success of our ground forces in the North African campaign, advancing with the front lines of the British 8th Army.

324TH FIGHTER GROUP (S) Mar.—Aug. '43
Same citation as 79th Fighter Group (S).

attacks on enemy airfield at Gerbini five days before our landings were made.

325TH FIGHTER GROUP (S) July 30, '43
Contributed directly to the surrender of the Island of Sardinia by destroying 21 enemy aircraft in a single, half-hour engagement.

44TH, 93D, 98TH, 376TH AND 389TH BOMBARDMENT GROUPS (H) Aug. 1, '43
Participated in the 2,400-mile flight to attack the oil refineries at Ploesti, striking a blow at a vital enemy resource.

3RD BOMBARDMENT DIVISION (H) Aug. 17, '43
(INCLUDED THE FOLLOWING GROUPS: 94TH, 95TH, 96TH, 100TH, 385TH, 388TH AND 390TH)
Executed the first shuttle mission in the ETO, wrought destruction on aircraft factory at Regensburg, Germany, and destroyed 140 fighters in the air.

82ND FIGHTER GROUP (TE) Aug. 25, '43
Dealt a crippling blow to the enemy prior to the Salerno landing by the first mass long-range, low-level, strafing attack on the Foggia airdromes.

1ST FIGHTER GROUP (TE) Aug. 25, '43
Same action as above.

310TH BOMBARDMENT GROUP (M) Aug. 27, '43
Hastened the collapse of the enemy in Southern Italy by destroying the heavily defended rail yards at Benevento, key transportation center of the Naples-Salerno-Foggia area.

82ND FIGHTER GROUP (S) Sept. 2, '43
Escorted 75 medium bombers over 360 miles of water to the

target (Cancello marshalling yards near Naples, Italy) and back to their base so efficiently that all the bombers returned safely despite heavy enemy opposition.

321ST BOMBARDMENT GROUP (M) Oct. 8, '43
Reduced strength of German XIth AF in the Balkans by persistent and extremely effective bombing operations, especially during a raid on this date on the Eleusis airdrome near Athens.

95TH BOMBARDMENT GROUP (H) Oct. 10, '43
Despite lack of fighter escort, successfully attacked target at Münster, Germany, and destroyed 41 of approximately 250 attacking enemy fighters.

390TH BOMBARDMENT GROUP (H) Oct. 14, '43
Rendered an invaluable contribution to the Allied war effort by seriously damaging vital industrial plants at Schweinfurt, Germany.

354TH FIGHTER GROUP Nov. 4, '43—May 15, '44
Flew the first long-range escort missions in P-51s on bombing attacks deep in enemy territory (ETO).

INDIA-CHINA WING, ATC Dec. '43
Exceeded substantially the tonnage objective set for the transportation of vital supplies to China by air during this month.

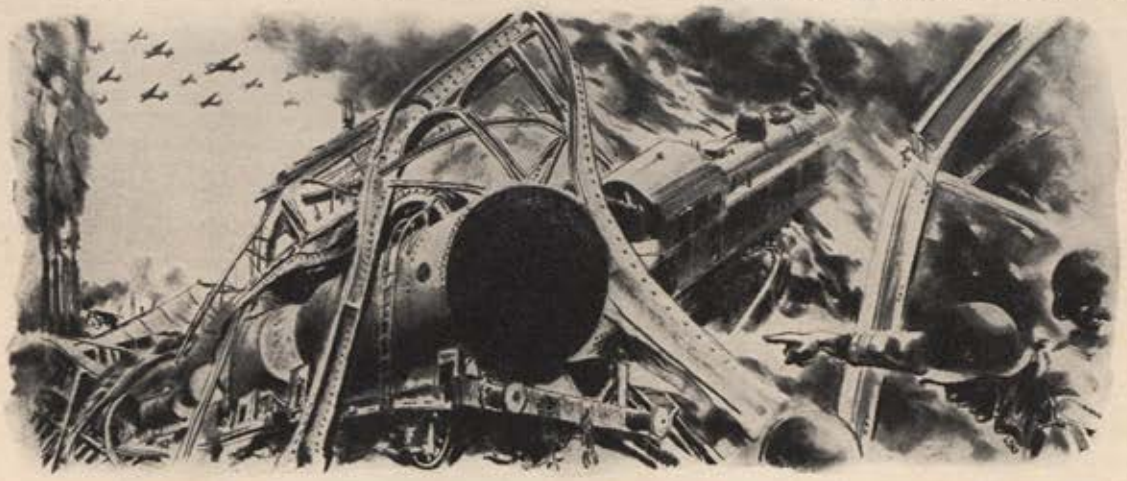
2ND BOMBARDMENT GROUP (H) Feb. 24, '44
Withstood concentrated enemy opposition while flying as rear group, without escort, in the attack of this date on Steyr, Austria.

451ST BOMBARDMENT GROUP (H) Feb. 25, '44
Led an entire wing formation in a bombing attack on aircraft factories at Regensburg which completely destroyed the target despite intense enemy resistance.

301ST BOMBARDMENT GROUP (H) Feb. 25, '44
Inflicted heavy damage on enemy aircraft factories at Regensburg, Germany, despite lack of fighter escort to target, and withstood attack by approximately 200 enemy aircraft.

319TH BOMBARDMENT GROUP (M) Mar. 3, '44
Inflicted heavy damage on marshalling yards at Rome, bombing with such accuracy that adjacent religious and cultural centers were not hit.

4TH FIGHTER GROUP (S) Mar. 5—Apr. 24, '44
By its determination, aggressiveness and will to engage the enemy, destroyed 189 enemy aircraft in the air and 134 on the ground during this period in the ETO.



17TH BOMBARDMENT GROUP (M) Jan. 1—July 31, '44
Achieved the unparalleled over-all bombing accuracy average of 63.07% in 215 missions flown during this period (MTO).

1ST BOMBARDMENT DIVISION (H) Jan. 11, '44
(CONSISTING OF THE FOLLOWING GROUPS: 91ST, 92ND, 303D, 305TH, 306TH, 351ST, 379TH, 381ST, 384TH, 401ST)
Led the 8th Air Force to its target in Central Germany and returned without fighter escort due to adverse weather conditions. Endured severe enemy attacks and is credited with the destruction of 210 enemy planes, largest total achieved by any division of the 8th Air Force on a single mission.

94TH BOMBARDMENT GROUP (H) Jan. 11, '44
Successfully bombed an aircraft components plant at Brunswick, Germany, despite weather conditions which recalled most of the other planes and compelled the group to make a second run over the target in order to identify its objective.

325TH FIGHTER GROUP (S) Jan. 30, '44
Neutralized the enemy's aerial defense at Villaorba, Italy, and made possible the success of the bombing attack which followed.

2ND TROOP CARRIER SQUADRON Feb. 1-29, '44
Supplied Allied forces isolated in Northern Burma with 5,661,725 pounds of war material, without which they would have ceased to be operative.

56TH FIGHTER GROUP (S) Feb. 20—Mar. 9, '44
Engaged enemy aircraft over Occupied Europe, accounted for 98 enemy aircraft destroyed, 9 probably destroyed and 52 damaged for this period.

97TH BOMBARDMENT GROUP (H) Feb. 24, '44
Led attack against an aircraft factory at Steyr, Austria, and after bombing the target, directed its fighter escort to protect the rear group in order to reduce the concentration of enemy aircraft against it.

319TH BOMBARDMENT GROUP (M) Mar. 11, '44
Repeatedly demonstrated superior bombing accuracy during critical periods in the Italian campaign, including a highly successful attack on this date on marshalling yards at Florence.

307TH BOMBARDMENT GROUP (H) Mar. 29, '44
Flew approximately 1,700 miles over water to attack Japanese base at Truk in coordination with naval task force operations in that area.

455TH BOMBARDMENT GROUP (H) Apr. 2, '44
Scored direct hits in face of enemy attack on important unbriefed target after finding the assigned target at Steyr, Austria, obscured by clouds.

14TH FIGHTER GROUP (TE) Apr. 2, '44
Assured the success of a bombing attack on enemy ball bearing works in Austria by effectively protecting the bombers it was escorting.

449TH BOMBARDMENT GROUP (H) Apr. 4, '44
Successfully attacked rail facilities in Bucharest despite bad weather that made the planned rendezvous with other groups and wings impossible.

451ST BOMBARDMENT GROUP (H) Apr. 5, '44
Attacked enemy oil installations and marshalling yards at Ploesti despite difficult conditions on the ground and adverse weather in the air.

350TH FIGHTER GROUP (S) Apr. 6, '44
Contributed to the success of Operation "Strangle," a vital phase of the Allied effort which resulted in the liberation of

Rome; brilliantly accomplished a variety of missions over vast areas and against great odds.

64TH TROOP CARRIER GROUP
4TH TROOP CARRIER SQUADRON OF THE
62ND TROOP CARRIER GROUP — Apr. 7—June 15, '44
Gave desperately needed support to ground units fighting in the Imphal Valley and the Myitkina areas of Burma.

96TH BOMBARDMENT GROUP (H) — Apr. 9, '44
Accurately bombed highly important aircraft factory at Poznan, Poland, despite generally adverse weather which caused other aircraft to abandon the mission and intensified enemy resistance to this group.

461ST BOMBARDMENT GROUP (H) — Apr. 12-13, '44
Carried out attack on an aircraft plant at Budapest despite severe weather conditions and heavy enemy attack on unescorted planes.

57TH FIGHTER GROUP (S) — Apr. 14, '44
Carried out low-level strafing and dive-bombing attacks in the Italian operations of early April, 194, and on this date flew six missions in which great damage was done to enemy communications in the Florence-Arezzo area.

7TH PHOTO GROUP (RECONNAISSANCE)
May 31—June 30, '44
Apart from regular reconnaissance duties, voluntarily undertook the most hazardous missions in order to further invasion plans and operations in Europe, sometimes converting from high altitude photo reconnaissance to tactical reconnaissance at medium to low altitudes.

61ST, 313TH, 314TH, 316TH, 434TH, 435TH, 436TH, 437TH, 438TH, 439TH, 440TH, 441ST AND 442ND TROOP CARRIER GROUPS — June 5-6-7, '44
Participated in the initial phases of the European invasion, delivering paratroops and releasing gliders carrying airborne infantrymen to their assigned areas.

315TH TROOP CARRIER GROUP — June 5-6, '44
Carried out night dropping operations in early hours of European invasion despite adverse weather conditions and alerted enemy defenses.

52D FIGHTER GROUP (S) — June 9, '44
Provided penetration, target and withdrawal cover for a bombing mission against targets in Munich, Germany, with such protection to the bombers that all returned safely.

31ST FIGHTER GROUP (S) — Apr. 21, '44
Destroyed 16 of 60 enemy planes it engaged after flying 580 miles through almost insurmountable weather conditions, as escort to a bombing mission in the Ploesti-Bucharest regions.

459TH BOMBARDMENT GROUP (H) — Apr. 22-23, '44
Completed a mission against the Bad Voslau aircraft plant in Austria despite desperate resistance by large enemy formations.

99TH BOMBARDMENT GROUP (H) — Apr. 22-23, '44
Led a successful mission against enemy aircraft factory at Wiener Neustadt, Austria; all aircraft returned safely to base despite severe air and ground resistance.

320TH BOMBARDMENT GROUP (M) — May 12, '44
Achieved spectacular results in attacks on heavily defended enemy troop concentrations, in cooperation with the Fifth Army's advance toward Rome.

463D BOMBARDMENT GROUP (H) — May 18, '44
Persisted in a bombing mission against Ploesti oil installations, despite weather conditions that caused all other units to abandon the mission, and bombed the target despite fierce opposition by enemy aircraft.

1ST FIGHTER GROUP (TE) — May 18, '44
Provided withdrawal cover for the mission of this date against Ploesti oil installations, and destroyed 10 of 80 enemy fighters which attacked the bombers.

86TH FIGHTER GROUP (A-36s AND P-38s) — May 25, '44
Made an outstanding contribution, in the Frosinone-Cori-Cescano area, to attacks which so crippled the enemy's transportation system in southern Italy that he was forced to abandon his projected defense of Rome and retreat northward.

464TH AND 465TH BOMBARDMENT GROUPS (H) — July 7-8, '44
Attacked vital oil installations at Vienna, Austria, despite intense enemy opposition.

449TH BOMBARDMENT GROUP (H) — July 9, '44
Successfully bombed oil installations at Ploesti, using PFF methods which penetrated enemy smokescreens that had caused other bombers on this mission to miss the target.

461ST BOMBARDMENT GROUP (H) — July 15, '44
Led a bombing mission against oil refineries at Ploesti and successfully used Pathfinder equipment to penetrate enemy smokescreens and focus the bombs of the entire formation on the target.

483D BOMBARDMENT GROUP (H) — July 18, '44
Destroyed all major installations of a target at Memmingen, Germany, and withstood concentrated attack by the enemy, destroying or damaging 62 of his aircraft.

31ST FIGHTER GROUP — July 25, '44
Completed a strafing mission over Poland in P-51s and while returning to its base in Russia, encountered a large force of enemy dive-bombers, destroying 27 of them.

885TH BOMBARDMENT SQUADRON (H)
(SPECIAL.) — Aug. 12, '44
Gave much needed assistance to French Forces of the Interior in a night dropping operation carried out on an instrument flight of over 1,200 miles.

484TH BOMBARDMENT GROUP (H) — Aug. 21-22, '44
Inflicted great damage on Lobau Underground Oil Storage in Vienna despite extremely adverse weather conditions and heavy enemy resistance.

They've Got You

BY SGT. LOUIS W. DAVIS

Army Airways Communications System

There was a brief lull in the Navy fighter and bomber traffic at Tacloban airstrip, Leyte, on A-day plus 5. A tired, hungry radioman of the Army Airways Communications System, one of the crew which had waded ashore on Leyte's White Beach three days before, removed his headphones, leaned back to relax a moment and turned to a fellow operator.

"Well, Mack," he said, "headquarters can hang up another red pin on that Pacific airways map. We're on the air—and how!"

These radiomen were doing again what AACS detachments had done time and time again in the Pacific, European and CBI theaters. They had gone in early to establish radio communications channels for the air traffic which would be coming along later. Until the airstrip was finished, they were to unpack transmitters, dig foxholes, erect tents, broadcast weather reports provided by AAF weather observers, and send and receive operational messages. Upon completion of the strip by the engineers, their task of PX-ing air traffic at Tacloban was to begin.

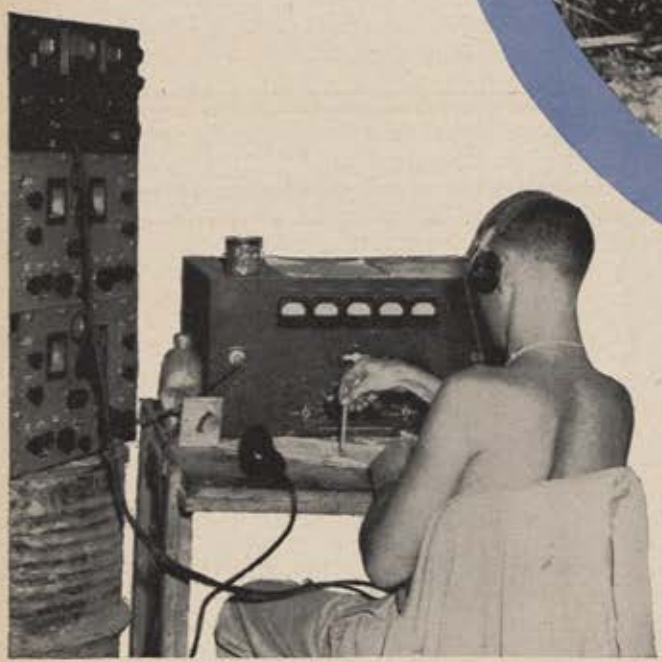
Tacloban airstrip was scheduled for its official opening on A-day plus 7, which would have been October 27, 1944, but the men who planned that schedule didn't know that nearly 100 Hellcats, Avengers and Helldivers, deprived of their jeep carrier bases by Jap shelling, were to arrive five days after A-day (see "Back to the Philippines," AIR FORCE, December, 1944). They neglected to note on that schedule that these Navy aircraft would be landed on the strip which was unprepared for anything larger than an L-4, that they would be repaired, refueled, rearmed and cleared off again to hit at the Jap fleet. The authors of the schedule might have scoffed at the thought of radiomen handling 200 landings and take-offs during a 20-hour period, just 3 days after wading ashore. But, that's what happened.

The AACS radio team at Leyte, and the others who went ashore at Saipan, Peleliu, Emirou, Green Island and Lae, are part of the AACS Pacific Wing, operating joint Army-Navy communications. This wing is one of eight covering

Life is no easy lot for weather and communications personnel who man the AAF weather station perched atop this frigid arctic ridge.

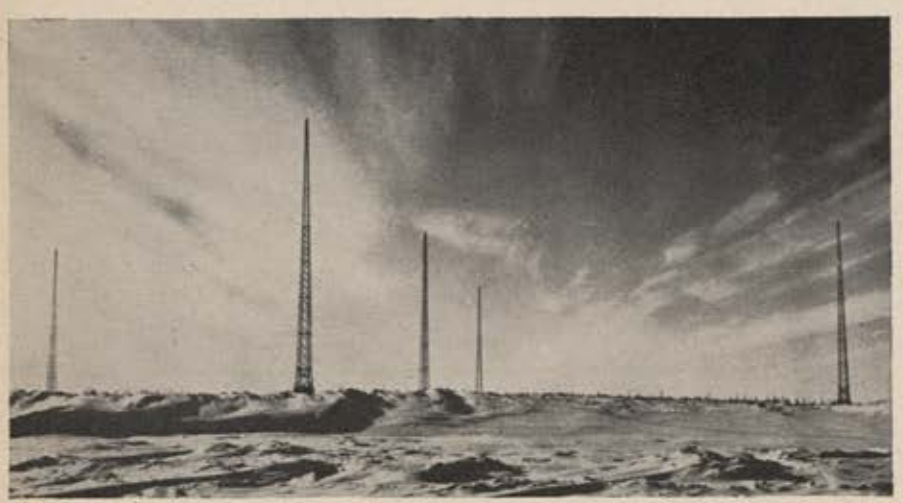
Covered

AACS men with the Green Island invasion forces spent the first days hacking away thick jungle growth before they set up shop.



Makeshift facilities were used to set up radio communications at the newly won airstrip near Myitkyina.

No matter where you fly over more than 100,000 miles of military airways, the AACS keeps a watchful radio eye on you—



Radio range transmitter towers rise above the windswept snow blanket which covers this station on the North Atlantic air route to the European theater.

Japanese bombs damaged this station in China but radio communications continued without interruption.

AAF airways which stretch through the States and 52 foreign countries and territories. These men are among the 30,000 officers and enlisted personnel—including Wacs serving in the U. S.—who are operating and maintaining communications and navigational aids along 100,000 miles of military air routes at 1,000 stations.

Other accounts of AACS radiomen at work may not equal the Leyte story for its drama, but they are indicative of the over-all job being performed.

Cpl. J. C. Melton, radio maintenance mechanic, was over 10,000 miles from Leyte in the winter of 1942. But he, too, was fighting a war—a war against the bitter cold and isolation of the Arctic. Melton and his crew of AACS GIs had a job to do in the power generator shack at Crystal Three weather station which had been set up on Padloping Island in the Canadian Northwest. The water pump on the only remaining Ford V-8 power generator had become defective, and it was up to Melton and his men to keep the plant going as the only source of power for radio and lights. They made their own cooling system and worked in shifts for days, dumping snow into a steaming oil drum which had been connected by hose to the generator.

Fort Lamy, French Equatorial Africa, lies 7,500 miles west of Leyte's White Beach. It was at this sun-baked, dust-covered airport that S/Sgts. William Tindell and John G. Koch, Jr., crawled from a plane on October 13, 1942, armed with a screwdriver and a rusty pocketknife. They were to keep Fort Lamy on the air with existing radio equipment so that aircraft could use this base for refueling on their flights from Accra to Cairo and the Middle East. Sweating out contacts in a thatched roof hut at 120 degrees in the shade and fighting dust storms which grounded radio transmitters rated priority in their personal kind of war.

Sgt. Robert A. Coop, one of five AACS men setting up radio at Momote airstrip in the Admiralties last March, knew that infiltrating Japs weren't particular as to whom they picked as targets. Radioman or not, he dug foxholes and put his carbine to good use.

Behind these men is the AACS organization of eight wings under the command of Col. Ivan L. Farman. At the time of the AACS' activation on paper in 1939, few even dreamed that these air-roads in four short years would extend from Tacloban airstrip at Leyte, through San Francisco, to Kunming, China.

The global network of the AACS today renders the following specialized services: air traffic control through airdrome control towers and ground-to-air stations; weather and operational communications lines via a point-to-point system of radio and landline facilities; route navigational aid to the pilot through an integral system of radio ranges, homing beacons, direction finder nets, instrument landing approach units and other radio aids still classified.

The first major AACS assignment came in late 1940. Its total strength of four officers and less than 100 enlisted men was scattered across the North Atlantic from Presque Isle, Maine, to Prestwick, Scotland. Capt. James Dyer with 11 enlisted men went by whale boat to Crystal Three. Others took up stations in Newfoundland, Labrador, Greenland and Iceland. Each set up temporary facilities in arctic weather until Signal Corps construction crews arrived to make them permanent and livable.

In sharp contrast to the trickle of bombers passing over these stations in 1940, weather permitting, are the traffic reports of round-the-clock operations today. ATC operates 500 scheduled round trips per month; it delivered 10,000 aircraft to the European theater in less than two years.

The North Atlantic AAF airway boasts of many firsts. It was the first military airway under construction; the first to hang up a 98.5 percent safety record, in 1943, and the first to be equipped for all-weather operation. It served as the springboard for AACS expansion to the operation of communications and navigational aids along the first established airways system around the world.

The military pilot using any section of the system today, receives the same service and aid as that described in the following typical flight over the Pacific:

The bomber pilot and crew of a B-24 are ready to take off from Hamilton Field, Calif., for Biak, New Guinea. They will fly this 8,500-mile overwater route for the first time, using several coral atolls for refueling and rest stops.

The first job of the pilot is to get the weather. Hourly reports on the 2,000-mile gap of ocean between Hamilton Field and his first stop, John Rogers Field, Honolulu, are available at Hamilton's AAF weather station. The weather briefing officer interprets the reports and provides the latest forecasts. From this intelligence, the pilot determines his most economical cruising altitude, considering favorable winds and bad weather which may be encountered. He estimates his ground speed and approximate time of arrival at Hawaii. Then he files his flight plan with Hamilton Operations for forwarding to the ATC Flight Control Center.

As the B-24's engines warm up, the pilot contacts Hamilton tower on his radio-telephone command set. Taxi clearance comes from the tower operator and the Pacific-bound bomber moves to take-off position adjacent to the runway in use. Here the engines are given a final run-up and the tower is contacted again for take-off clearance.

Tower operators regulate the movement of incoming and departing aircraft, thus providing air traffic control within the airport control zone, usually an area covering a radius of three miles in all directions. When the B-24 is cleared for take-off, the tower operator notes the time, and, by telephone or squawk-box, ATC flight control receives the time of departure from the tower. This data, together with the ETA, goes to the point-to-point operator for forwarding to John Rogers Field Operations.

From this point on, the pilot depends upon AACS air-to-ground radio communications. He has received clearance out of the control zone from the tower and now takes up airway heading while climbing to desired altitude. The navigator starts his 10-hour task of plotting positions and charting progress along the route. At regular intervals, the B-24 radio operator calls AACS air-to-ground stations via radio telegraphy or CW (continuous wave)—using the liaison set—to report the bomber's estimated position. Each time he transmits, AACS radio direction-finder nets take a bearing on the radio signals and check the reported position. If the latter is off, further bearings are taken and the pilot is advised through air-to-ground station contact.

West Coast AACS serves the B-24 until it has passed the halfway position, over a 1,000 miles out. At this point, communication is switched to the Hawaiian system of the 7th AACS Wing. En route, the B-24 radio operator keeps a check on the weather ahead and transmits any changes in conditions encountered by the plane to air-ground stations.

When the B-24 is within 500 to 600 miles of Hawaii, the radio range or homing beacon signals are audible. The pilot tunes to the frequency of the aid desired and flies a direct line of approach to John Rogers Field.

Some 15 miles from John Rogers Field, the pilot contacts the tower, reports his position in the area and asks for landing instructions. The tower assigns the B-24 a position in the landing pattern within the control zone. The pilot also keeps his command receiver on the tower frequency and listens for instructions from the tower which are pertinent to his safe conduct through the traffic area to the landing.

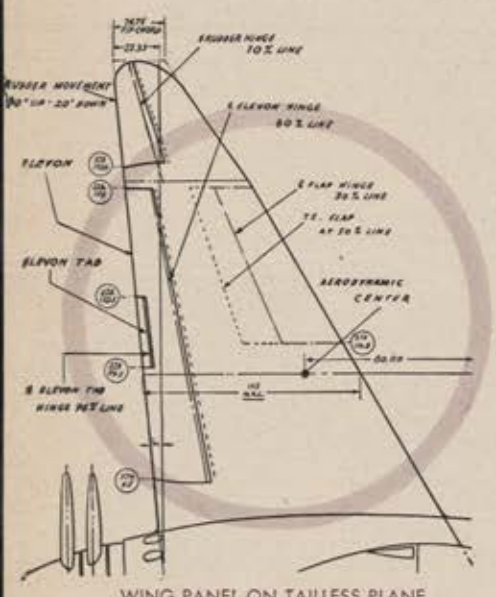
Should low ceiling conditions at the airport require in-

(Continued on Page 59)

WRIGHT 1908 MODEL

WING LOADING

B-29 EMPENNAGE



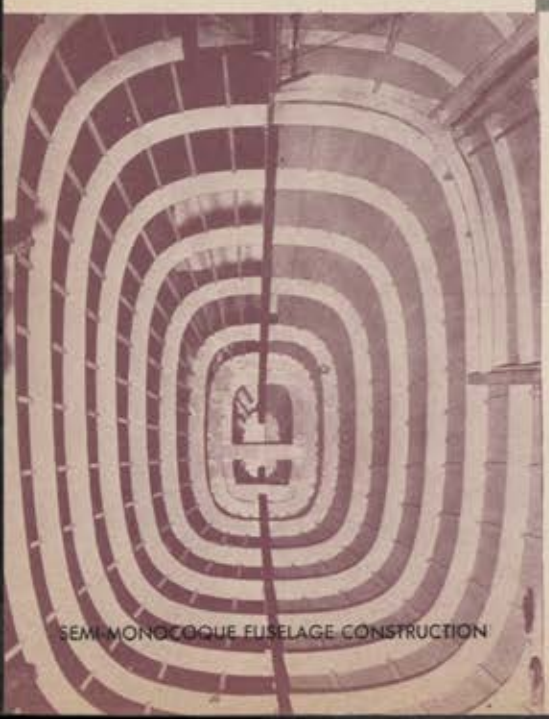
WING PANEL ON TAILLESS PLANE

B-29

DESIGN:

key to air superiority

BY MAJ. ROBERT V. GUELICH AIR FORCE *Staff*



SEMI-MONOCOQUE FUSELAGE CONSTRUCTION

AIRFOIL TYPES

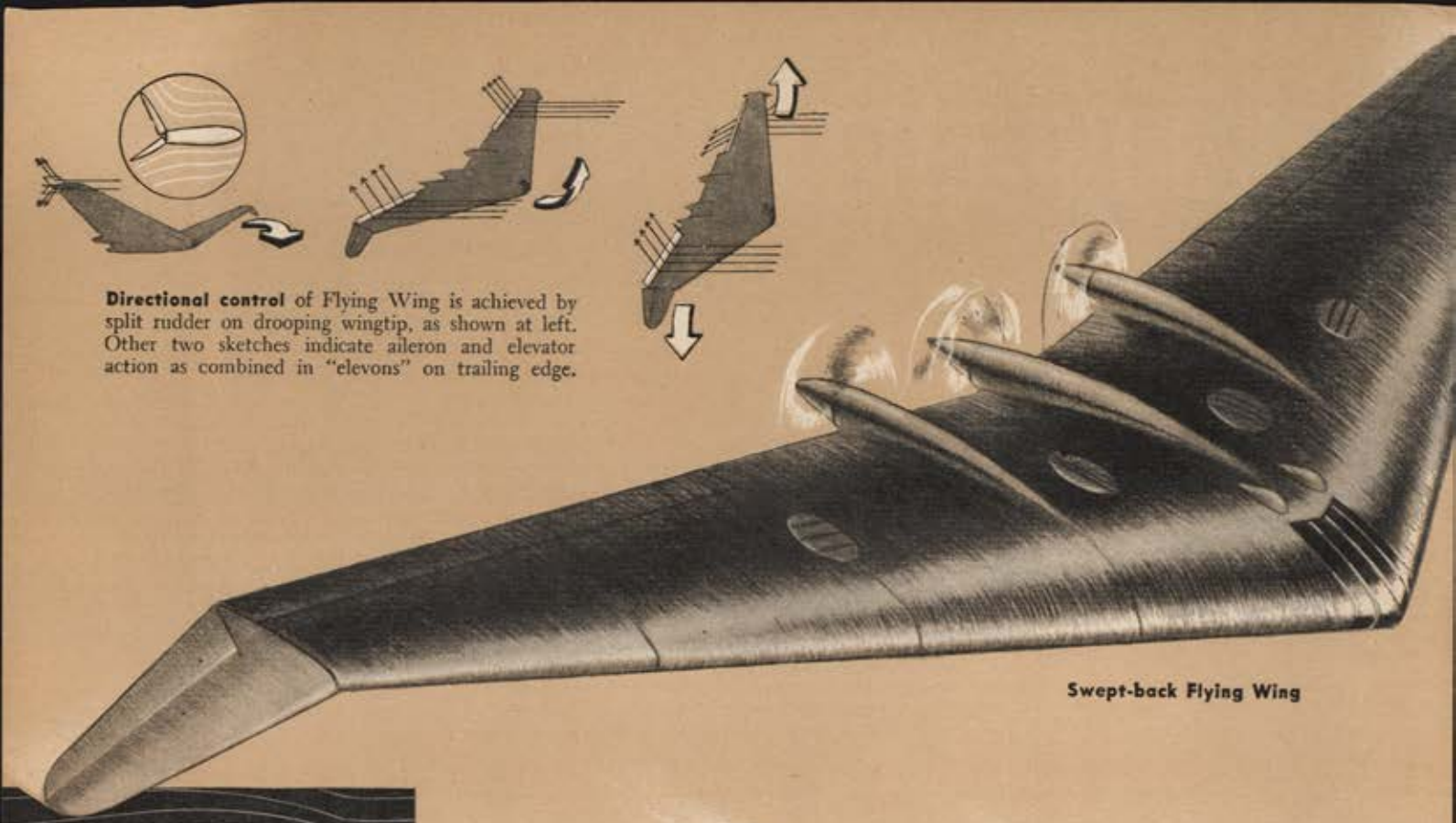
Key to air superiority is design—the shaping of wings, fuselages and control surfaces, the harnessing of power, and the arming of airplanes as more deadly weapons that can fly greater war loads farther, faster and higher than any enemy aircraft while preserving the maximum of safety for our crews.

World War II has crystallized many trends in aircraft design—some old, some new—and has accelerated development of many radically different designs that may establish the pattern for aircraft of the future.

Advances in turbo-jet and rocket propulsion are accelerating development of near-wingless aircraft, such as robombs. At the other extreme of aircraft design is the all-wing aircraft, or Flying Wing, which is emerging from the experimental stage.

Since 1917, when experimental engineering became an integral part of Army aviation, "idea men" of the AAF constantly have been striving to make the airplane a better warplane. At Wright Field's Aircraft Laboratory, the basic problems now are to reduce airflow drag, to design high-speed wings that can fly beyond compressibility limits, to simplify control and improve stability, to adapt more powerful engines—conventional and jet—to all aircraft.

Directional control of Flying Wing is achieved by split rudder on drooping wingtip, as shown at left. Other two sketches indicate aileron and elevator action as combined in "elevons" on trailing edge.



Swept-back Flying Wing

DESIGN:

Swept-forward Flying Wing

Fundamental principles of flight developed by such pioneers as Leonardo da Vinci, Lilienthal and the Wright Brothers, continue to provide the basis for all winged aircraft designs. Changes we sometimes call "revolutionary" are only modifications and refinements of the basic precepts.

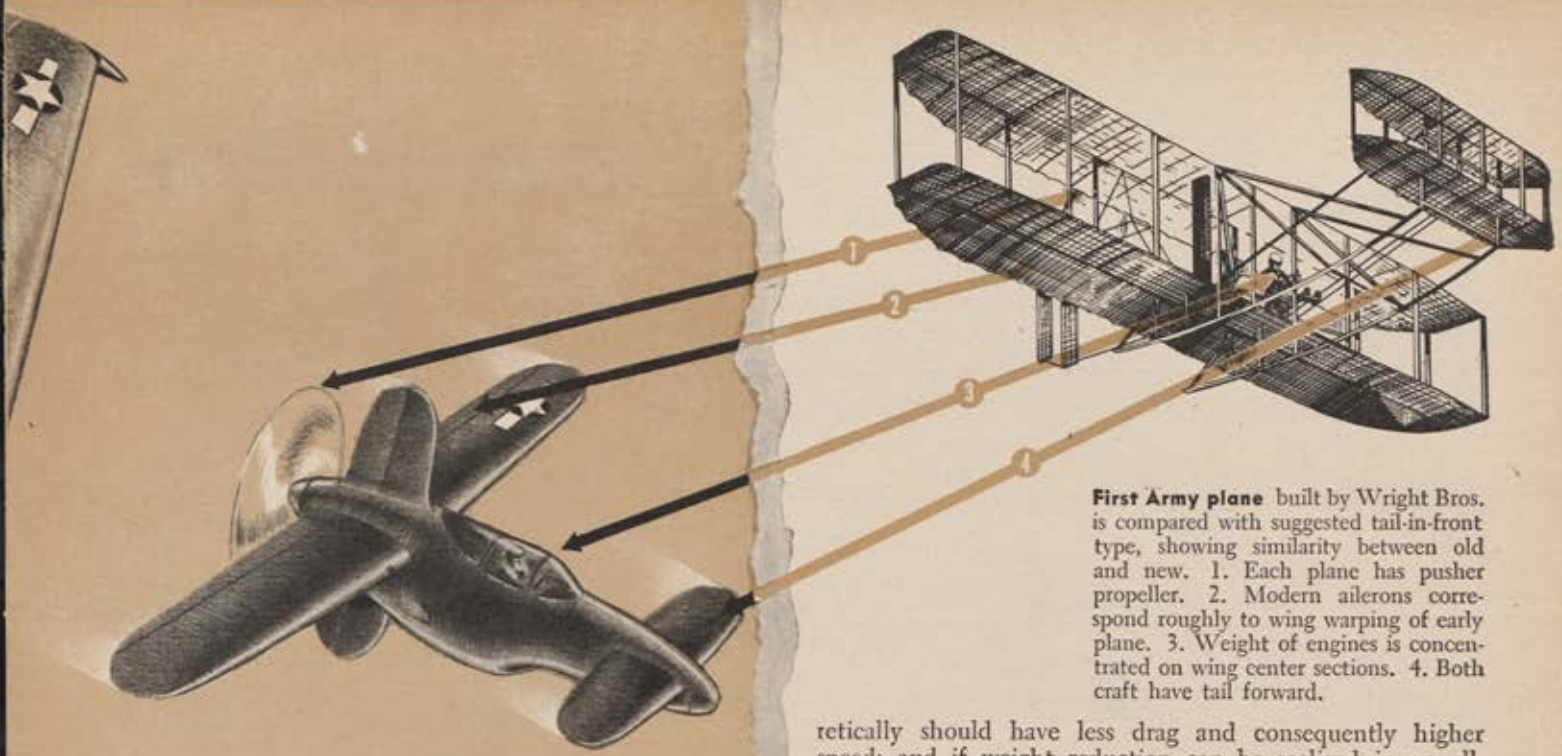
The B-29 flies the same way, aerodynamically, as the first Army plane, bought from the Wright Brothers in 1909. But the wing of the B-29, because of its improved airflow characteristics, enables the Superfortress to lift 100 times the gross weight of the first military airplane. The B-29's four 2220-hp engines—each of which develops approximately 100 times the power of the *Wright Flyer's* small gasoline engine —drive propellers that pull the big bomber at 9 times the speed of the Wright plane and for 50 times the distance.

Progress of aircraft design has not been retarded by a "law of diminishing returns." Only limitation has been the rate of development of new materials, powerplants, methods of fabrication, carburetion and cooling radiators.

One major trend in wing development is toward the tailless airplane or the Flying Wing. Many elaborate claims have been made for this envisioned plane of the future, but because of its current limitations as an effective combat plane, its development has not kept pace with that of today's conventional aircraft.

The reason for such a design is obvious. Engines and payload are buried inside a large airfoil section, eliminating the drag of cockpit, fuselage, engine nacelles, rudder and stabilizers that disturb airflow around conventional aircraft.

A tailless airplane with less "wetted area" (surface exposed to the airstream) than a conventional plane theo-



First Army plane built by Wright Bros. is compared with suggested tail-in-front type, showing similarity between old and new. 1. Each plane has pusher propeller. 2. Modern ailerons correspond roughly to wing warping of early plane. 3. Weight of engines is concentrated on wing center sections. 4. Both craft have tail forward.

retically should have less drag and consequently higher speed; and if weight reduction can be realized in an all-wing plane it should have superior climb characteristics. Combined, these factors would increase the range.

Under emergency conditions, conventional aircraft can be flown with relatively large variations in CG positions. But tailless aircraft with like variations in CG would not be flyable. This is one of the principal "bugaboos" that must be whipped before the Flying Wing attains practicability.

Flaps on conventional aircraft increase the lift of the wing at low speeds, but the pitching moment of the lowered flap can be trimmed out by elevators. In large tailless aircraft, elevator control is less effective and cannot economically compensate for high pitching moments which would result from use of large flaps. Therefore, increased lift can be obtained only by increasing wing areas, thereby reducing some advantages gained by elimination of drag and weight.

At present, tailless aircraft designs fall into two major categories—the "swept-forward" and the "swept-back" wing.

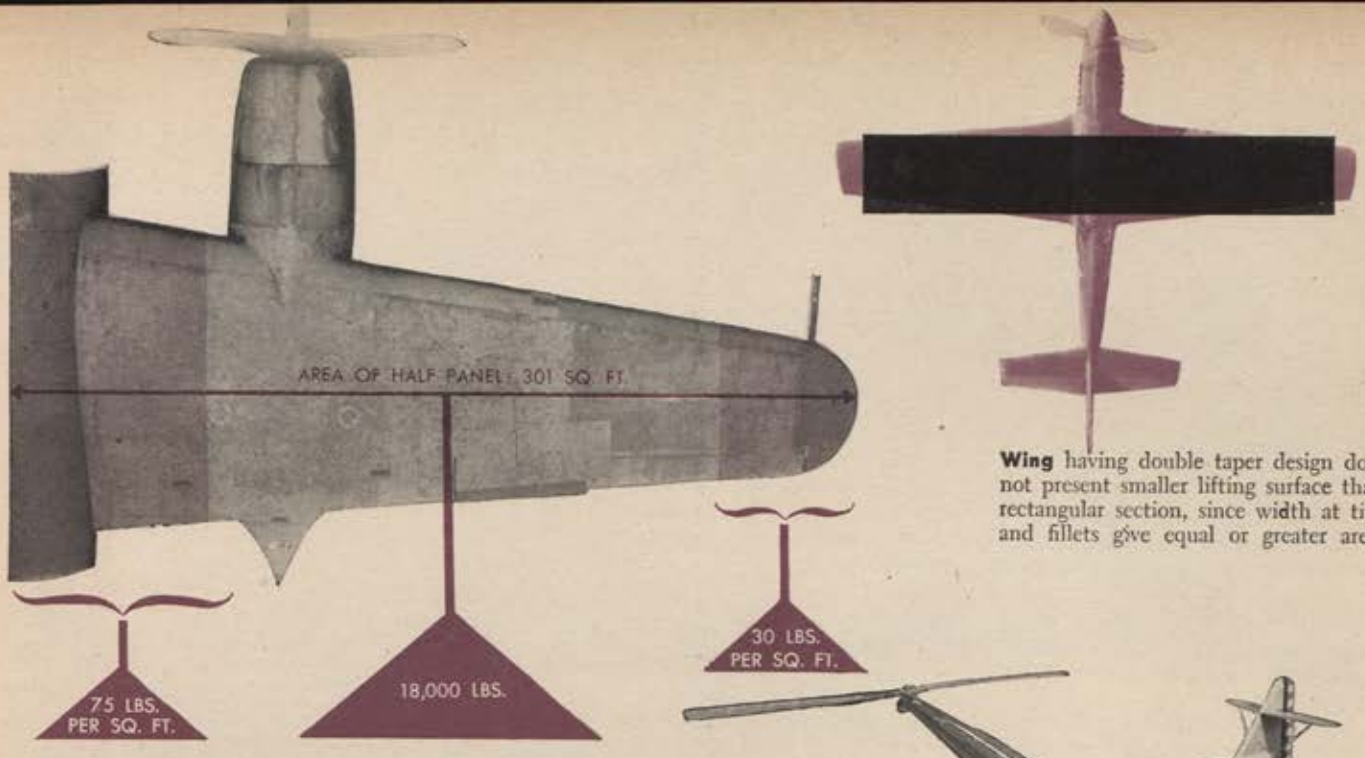
The swept-forward wing design eliminates the problem of wingtip stall, common to swept-back wings, and has control surfaces farther behind the center of gravity to increase controllability. This difference in control surface location also permits increase of the CG range. But this type of aircraft requires a partial fuselage—which in turn necessitates use of a vertical tail and rudder—properly to locate the CG ahead of the center wing section. While increasing directional stability and control, these modifications nullify some of the low-drag, low-weight advantages of the flying wing.

• As a fighter-type aircraft, however, the swept-forward design has some definite combat advantages over the swept-back design. The pilot can be located ahead of the wing in the small fuselage where vision is best; he also can fly the plane from a prone position, reducing the danger of black-out and increasing comfort. Armament can be concentrated in the nose where structural strength permits heavier-caliber weapons to be installed.

The "swept-back" design is best for bombers and transports since fuel and bombs can be located in the roomiest and the strongest part of the wing where effect on balance is minimized when bombs are dropped and fuel is consumed.

Test flights of prototype models of tailless aircraft indicate that chief advantages of this design may be realized only in the very large bombers and transports since the fighter designs do not have enough room for installation of the equipment now being carried by conventional planes.

Designer's Conception

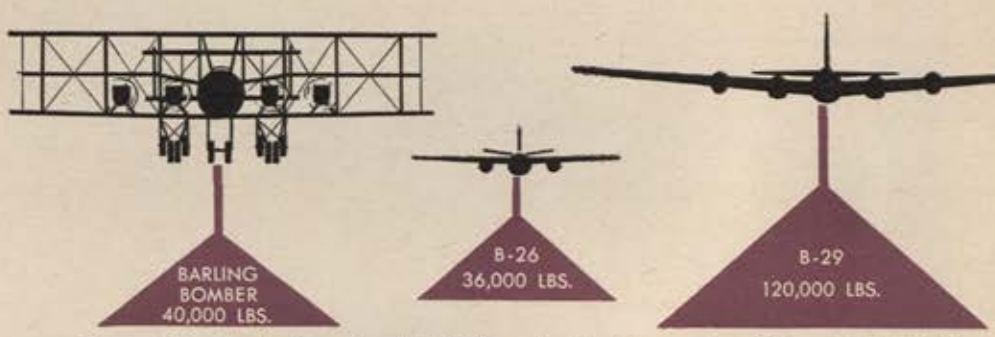


Wing having double taper design does not present smaller lifting surface than rectangular section, since width at tips and fillets give equal or greater area.

B-26 wing illustrates that as area of supporting surface decreases, load per square foot is lessened.

Helicopter blades are rotary wings with changeable pitch to give thrust and lift.

DESIGN:



Progress in wing loadings show that B-26 carries almost as much weight as obsolete Barling bomber, though latter has three wings, while B-29 trebles load with only slightly more span.

Since flight characteristics of an aircraft may be determined to a great extent by basic wing design, trends toward higher wing loading and thinner wing construction are fundamental and exert great influence in the design of conventional type aircraft.

Because an aircraft with a high wing loading requires more speed and greater distance for take-off than one with a low wing loading, aircraft design necessarily is compromised by the length of available runways, unless the plane is aided by assisted-takeoff devices. Various systems of rocket propulsion have been developed to step up the rate of acceleration and hurl the plane into air in one-half the distance normally required—this distance depending upon the amount and duration of the rocket thrust applied.

When tactical experience in this war revealed that most combat flight strips were long enough, or could be lengthened, to take care of any type of aircraft under development, design and use of planes with high wing loading were stimulated. Consequently, in the last five years the ratios of maximum speed to stalling or landing speed—sometimes referred to as speed ratio—have been increased on our aircraft by 50 percent.

At present, maximum wing loadings are in the range of 70 to 80 pounds per square foot in bombardment aircraft, and 40 to 55 pounds per square foot in commercial aircraft, which must land at lower speeds to abide by CAA regulations. Higher and higher wing-loadings can be adopted, but, as a general rule, not until additional horsepower per pound is harnessed in aircraft engines.

As military requirements have called for higher speed aircraft, designers have concentrated on development of thinner and more efficient high-speed wings to combat the effects of compressibility. Because a thick wing accentuates the airflow velocity ratio over its surface, compressibility shock waves are induced at lower speeds. It is for this reason that higher speed planes evidence a design trend toward smaller and smaller wings.

Continual increase in wing loadings and the compressibility demands for thinner wings have greatly increased wing structure problems. In bombers, reduction of the space inside the wing for loads such as fuel tanks—that tend to reduce the upward bending of the wing in flight—have to be compensated for by a heavier wing structure. In fighters too the thinner wing decreases the space available for such

items as landing gears, armament, etc., and creates the need for increased structural strength to withstand lift forces and torsional loads on the wing. Provision also must be made in such planes for placing fuel tanks in the fuselage since wing tanks, to fit into the thinner wing, must be reduced in size.

As stronger, lighter-weight materials are perfected, further reduction of wing area and wing thickness may be attained for high-speed aircraft.

While aluminum alloys continue to be most practical for aircraft structures, other materials are being improved to the point where they now are used in many liaison, training and cargo planes. Stainless steel is comparable to aluminum on a strength-weight ratio and holds considerable promise in future high performance airplanes having relatively thin wings with high wing loading. Therefore, it may be used to advantage on some planes when the required skin thickness is sufficient to provide smooth surfaces. Magnesium and beryllium alloys also are being adapted to some structural parts. Because high strength steel has low-creep characteristics at high temperatures it is being used more extensively in jet turbines.

Light weight, easily fabricated plastic and impregnated fibre glass already have been used successfully in experimental and production planes. Chief advantages of these materials are simplicity of design and construction, and their ability to be bonded continuously by "cement," eliminating the disadvantages of riveted and welded joints. The impact-absorbing characteristics of these new materials are particularly important for protection of combat aircraft against low velocity flak. Continuing experiments to determine resistance to weather exposure and extreme temperature variations will determine the limitations of these materials for general use in combat planes.

To improve the aerodynamic efficiency of conventional wings, some aircraft have been designed with pusher propellers to eliminate propwash over the wing. This type of powerplant installation was on the first *Wright Flyer*. Since then, such AAF planes as the Barling Bomber (4 tractors, 2 pushers), the twin-engine Bell Airacuda and the single-engine Vultee XP-54 adapted the pusher propeller principle.

Chief disadvantages of this type of installation are that auxiliary cooling equipment for ground operations is necessary since airflow through the engine is reduced; a longer take-off run is required because the advantage of increased airflow speed over the wing of the tractor-type plane is sacrificed; pilots are reluctant to sit in front of propellers because of danger in bail-outs; stones are thrown into the propeller from the landing gear; flow of air over flaps interferes with airflow to the pusher propeller, forcing reduction of usable flap deflection in order to prevent large losses in propeller efficiency and consequent long take-off runs. In smaller types, ground protection for the propeller is necessary, so an extended tailwheel gear prevents the propeller from striking the ground at the planes' landing angle.

As these problems are solved, the pusher type airplane and the utilization of jet propulsion may offer advantages over conventional designs in pilot vision, forward angles of fire and improved airflow over the wing.

The more radical designs which visualize a pusher propeller behind the tail are confronted with the serious problem of properly locating the engine without making the plane tail-heavy. Extension shafts for the propeller can be used if the design offers enough advantage over our present planes.

Use of pusher propellers on large bombers, possibly in combination with tractor propellers, or "pusher" jets with tractor propellers, may prove to be practical applications of this type of powerplant installation.

Tail-first pusher type aircraft are of interest to designers

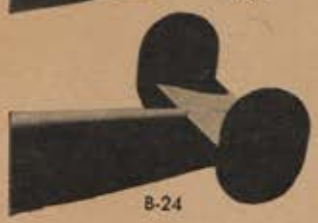
Wing of Wright Bros. 1908 model had wire trailing edge.

B-24 uses Davis wing with a reverse curve at trailing edge.

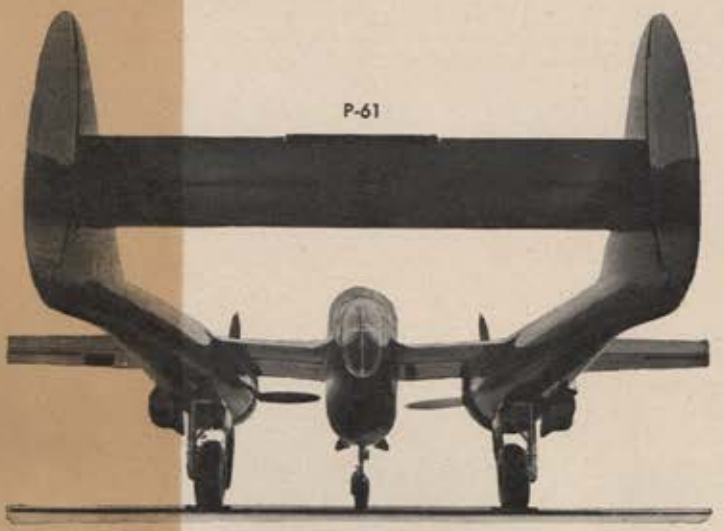
P-63's laminar flow airfoil has thickness toward the rear.

Symmetrical airfoil features Flying Fortress's wing profile.

Future planes of supersonic speed may have angular airfoil.



Representative empennage assemblies illustrate trend toward reduction of drag. Above, B-17G tail is compared with old type, while twin-boom structure of P-61, below, streamlines engine nacelles. Constellation and Liberator rudders, at left, typify tendency toward repair accessibility and space saving.



DESIGN:

Primary function of bombers is to carry destruction to enemy, and increased explosive loads affect fuselage design. Elongated bomb bay of A-26 adds no beauty lines but holds aerial torpedoes for shipping attacks.

because they require little compromise in forward field of fire and can house practically any combination of armament. Problems of instability and control, attributable to the forward location of the elevator in respect to the wing, must be solved before more extensive experiments can be made to determine the practicability of such aircraft.

Design developments of greatest military importance in this war have been the unglamorous ones that have rapidly improved performance of our conventional aircraft—a new ducting system for an oil cooler, a small strip of fairing, a change in the weight distribution, refinement of control surfaces, lengthening of bomb bays to hold larger bombs. These are the basic steps that chart the course for some trends in the design of our planes tomorrow.

Surface drag, resulting from the tendency of air to cling to the airplane skin instead of sliding over it, proved to be so important that we abandoned the use of camouflage paint in favor of smoother unpainted metal where the military situation permitted. In tests with a P-51, removal of the rough paint surface increased top speed approximately 40 mph at its critical altitude.

To reduce external drag to a minimum, the "laminar flow" airfoil was developed and flush-rivet, spot-weld and plastic cement methods of joining parts are being utilized to obtain smooth surfaces in fabrication. Antennae have been streamlined and in some cases removed from the airstream; turrets have been cleaned up aerodynamically, to some extent, and some now are retractable. Fillets have been designed to fill up angular joints that had prevented smooth

airflow along the fuselage at wing or tail intersections. These modifications require hundreds of hours of designing and testing but pay off in additional speed, range and handling characteristics of original plane designs.

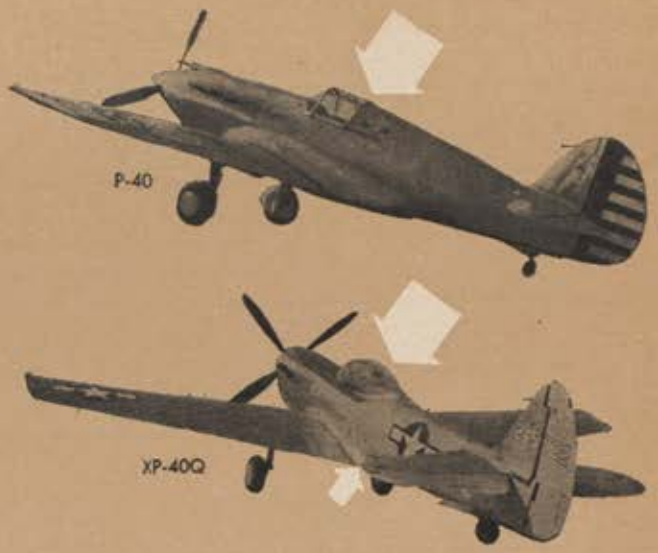
At one time not so many years ago, the layman regarded a twin-boom arrangement as a radical design change. Actually it does increase the weight of an aircraft, but as an extension of the engine nacelles, it is simply an aerodynamic refinement—reducing drag by smoothing out the airflow behind engine nacelles. One test conducted by the AAF revealed that extending the engine nacelles two feet increased the speed of a conventional aircraft approximately 10 mph by smoothing out the airflow.

The twin-boom, twin-tail design, further extends the nacelles to the tail assembly, provides room for more equipment in the booms and permits reduction of the size of the center fuselage. Also, its tactical advantages are better dispersion of defensive armament, improved forward and rear vision. Side vision, however, may be poorer than in other arrangements. The twin-boom arrangement and the pusher type aircraft represent attempts to reduce drag and improve aerodynamic efficiency of specialized aircraft.

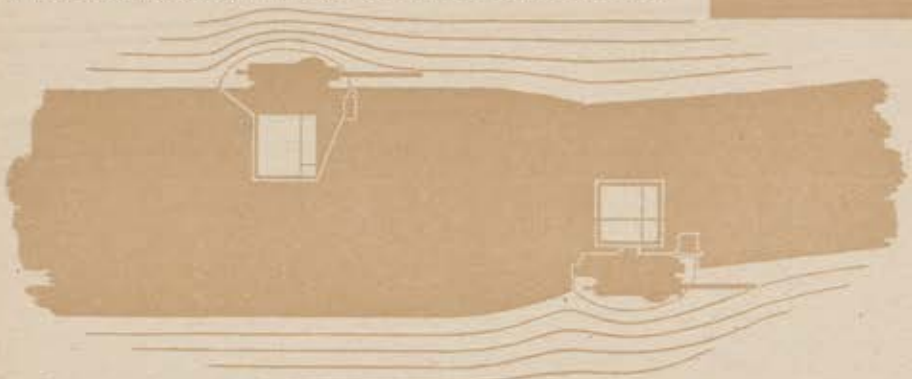
Overall design development during the war has emphasized a trend to specialized aircraft. As performance of each airplane type has been increased, in some cases the ability to perform alternate missions has been reduced. A high altitude escort fighter may be handicapped in speed and maneuverability at low altitudes where it may be less efficient and where its supercharger and oxygen equipment are dead weight. A heavily armed, low altitude attack bomber substitutes guns and ammunition for the bombs, gasoline and bombardier that are needed on a medium altitude precision bombing mission. Our planes can perform alternate missions, and in emergencies frequently are modified as combat conditions change, but performance usually is not as satisfactory as when the plane is designed for only one specific type of mission.

The performance and utility of our pre-war aircraft have been greatly improved during the last three years. Whenever possible, necessary changes have been built into production line planes. However, extensive modification leads to development of new aircraft—A-20 to A-26, P-39 to P-63, B-17 to B-29—which will in turn be improved until they reach the limits of their development when another new design will be put in production. Some of these planes of the future already are being flown experimentally. Meanwhile, creative designers are engrossed in solving the problems of compressibility, determining the effects of adiabatic heat (heat of compression generated by high-speed flight), and searching for improved control devices that will enable our planes to hold the aerial superiority they are winning. ☆

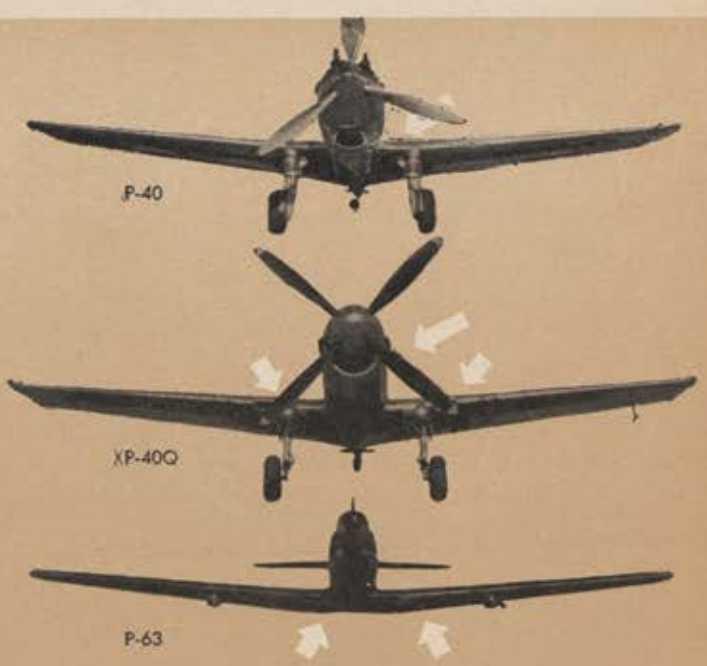
This is the first of two parts on "Design—Key to Air Superiority." The second will appear next month.



Bubble canopy on experimental Warhawk smoothes airflow over fuselage, and reduced fairing on XP-40Q. (small arrow) cuts down on parasite drag, increases speed.



Installation of remote-control gun turrets has eliminated protruding domes, since gunner may be placed elsewhere in plane. The sketch at left shows upper and lower RCT (remote controlled turrets) of the A-26.



More mph are added to fighters through relocation of airscoop. In XP-40Q, vents in wing divide job, while in P-63, at bottom, scoops are built right into airfoil.

ISOLATING THE BATTLEFIELD

(*Continued from Page 9*)

or less brought to a halt by our own increasingly difficult supply problem. We covered so much ground so fast that we simply had to pull up, reestablish our supply lines, fill our new advance dumps, repair or construct airfields within easier reach of the new lines, reorganize our troops, and in general get ready for another push ahead.

In this sense, even the most successful advance is self-limiting. Modern warfare imposes this limitation because the modern army, particularly the modern army in attack, requires an overwhelming supply of ammunition, gas and munitions of all kinds. The Germans suffered an enormous defeat in France. They were greatly weakened by losses of men and materiel. One circumstance, however, favored them: while we were leaving our main sources of supply farther and farther behind, they were getting closer and closer to their main sources with every mile of their retreat. This logistical movement is like that of a spring; power increases under compression. We had to get new bases so that we could push our spring up and get force into it again.

The Germans, who are good soldiers and always pretty much on the ball, took the fullest possible advantage of our pause. We can't pretend to know exactly what went on in the minds of the German High Command, of course, but several fairly safe assumptions can be made. They knew that we were going to have to pull up, and that we would be capable of no serious, full-power thrust for a certain number of weeks after we stopped.

They knew that until we got the port of Antwerp, we simply could not bring in the volume of materiel which a full-scale offensive would require.

When we finally got Antwerp and opened the port, the German High Command must have known that it would not be long now. We were pressing their armies, and pressing them hard, at point after point from the North Sea to Switzerland. They could do two things: one was to sit and wait for a blow certain to come in smashing force at some place which we might select. The other was to seize the initiative at any cost, hit us where it suited them, and see what would happen. They chose the latter—an audacious move—probably because they were desperate.

Only desperation would have ignored the principle which this war has firmly established: heavy odds lie against any offensive attempted without control of the air. The Germans did not have control of the air. By our calculations, and they proved about right, the GAF's maximum potential was no more than 1,100 sorties on one day. On this basis, they did not have even air equality. We could match each one of those 1,100 planes with five or six. For the German break-through to be permanently successful, isolation of the battlefield was absolutely necessary. It was as certain as anything in war can be that the battlefield would be isolated —but not by the Germans. As soon as the impetus of the initial drive was spent, the Germans would find their supply lines wrecked, their reinforcements halted, their fuel and ammunition largely cut off—while the flow of our supplies and reinforcements would continue almost undisturbed.

This, of course, is exactly what happened.

The initial break-through was protected by a few days of bad weather. German meteorologists must have figured prominently in the planning of the German offensive. Because most European weather moves from west to east, their facilities for weather observation were probably not as extensive as they would have liked. Perhaps they predicted a longer spell of bad weather than actually occurred.

At any rate, the Germans made good use of their temporary advantage. By December 24 their spearheads were 50 miles into Belgium, almost to the vital line of the Meuse River. There the stiffening resistance of our ground forces—and, no doubt, the first effect of that self-limiting factor in any offensive—brought them up short. A critical moment was approaching. Could the Germans get their supplies and reinforcements smoothly and rapidly for a further push? They could not. The simple reason was that the weather cleared, and at once the Allies took to the air in enormously superior strength. With hundreds and hundreds of planes, they headed for the supply lines through which Marshal von Rundstedt's vital means for advancing, or even staying where he was, would have to move. From this moment, there was no let-up in the terrific plastering. We, and not the Germans, were isolating the battlefield.

After that period of bad weather from December 19 through December 22, tactical operations built up to a peak on December 24. That day the 9th Air Force, together with elements of the 8th Air Force which had joined the operations, flew 5,262 sorties. Throughout the period from December 16 to January 2, the tactical air blows were heavy and carefully aimed.

Altogether, more than 120 major marshalling yards, airfields, bridges, rail cuts, communications centers, and troop concentrations—from the central battle areas back to the Rhine River—were hit. Rundstedt's lines of supply to the salient were not merely interdicted at single points. Repair difficulties were heaped up by cutting the lines both forward and behind. The pattern for attack spread east of the Rhine to the communication centers which were essential to the movement of supplies from central Germany.

It is true, of course, that broken railroad lines and wrecked marshalling yards can be cleaned up and restored to use in what often seems a miraculously short time. But everybody knows what happens on one of our own railroads here at home when a few yards of track are torn up, a locomotive derailed and some box cars piled across the right-of-way. Trains are going to be delayed from one to ten hours. Imagine that line wrecked at half a dozen points, and wrecked again and again. Then you can guess how much of his time Marshal von Rundstedt must have spent pacing up and down, looking at his watch, while the vital trainloads of supplies waited helplessly on sidings a hundred miles away. Very often these supplies were not merely waiting; while they waited, they burned and exploded under direct attack of the tactical air forces.

We have good evidence that by January 1 this situation was more than the enemy could cope with. At German headquarters it must have been felt that something had to be done to check the galling attacks. Shortly after 0900 on New Year's, the Germans sent several hundred planes to attack 16 of our airfields in France, Belgium and Holland.

For the first time in months, the Germans made a large-scale air attack, but the damage was not severe enough to reduce our air effort.

In those days from December 16 to January 2, then, tactical air operations rounded out the principles demonstrated in Normandy. The Germans may make other thrusts elsewhere with forces and supplies massed for that purpose. Yet no such thrusts can be successful so long as we maintain air superiority. First-line German troops have experience—some of them six years of it—behind them. They are doing all that experienced and well-led troops can do, and we have every reason to respect them for toughness and resourcefulness. They will not fold up just because their first counter-attack failed. But this we do know: in the end they will fold up. There can be no final success in modern war for a military power that does not control the air. ☆

CROSS COUNTRY

News and Views around the World

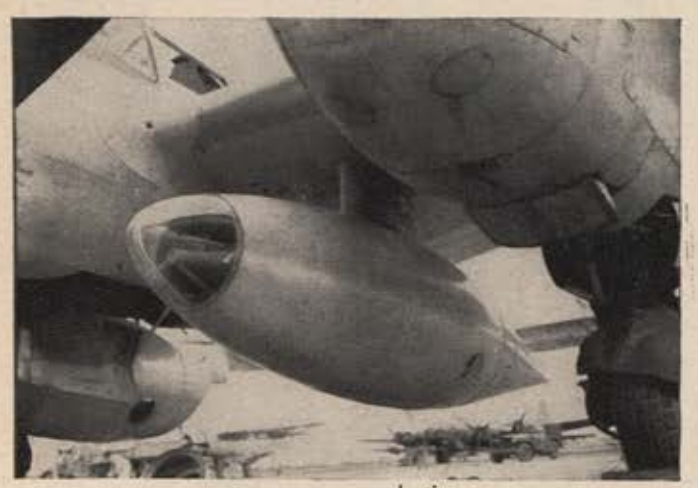
Mascots in the AAF—See Page 40

Cargo Cocoons

Fighter squadrons soon may be flying into advance bases with their own ground crews, comfortably lounging in cocoon-shaped auxiliary wing tanks, and enough supplies (except gasoline and oil) to fly operational missions for several weeks. In the Pacific and CBI, wounded men already have been carried to rear bases in make-shift modifications of ferry tanks. Beer, medicines and critical repair parts frequently have been stuffed into the tanks when transport planes were not available.

At Eglin Field's Proving Ground Command, all types of supply loads have been packed into 310-gallon capacity ferry tanks on P-38s to prove the reliability of carrying personnel and cargo under various flight conditions. Dummies were kicked out of the jettisonable tail cone at first to make sure a man could get out in an emergency. Then, Chief Warrant Officer George L. Singleton, a veteran of many jumps at Eglin, emerged from the wing tank cocoon at 7,000 feet and 170 mph indicated airspeed and easily parachuted to earth, demonstrating that a man could bail out without difficulty.

Hitch-hiker's dream—



—plastic nose cargo cocoon—more comfortable than your own sack

The cargo-carrying cocoon tank is a standard type but is modified by removing the innerlining, inserting a plexiglas nose and a jettisonable tail cone. It has an 1,800-pound capacity and two men can be carried comfortably, although it is big enough to transport three, somewhat crowded. An intercom system links the pilot with his passengers under each wing. Into each cocoon tank of a fighter can be packed enough mechanical supplies for minor repairs of a squadron for five days; enough ammunition for three and a half days, as well as four extra machine guns and enough rations for 24 men for three and a half days.

Armament supplies in cocoon

After Germany Falls

Concluding his second wartime report to the Secretary of War, General Arnold observed that the AAF operation in the Pacific after victory in Europe will be more than the simple matter of flying our men and planes from Europe to the Far East and promptly bringing Japan to her knees. Bombers can fly to the Far East, but fighter planes must go by boat, and that takes time. Planes must have modifications. New airbases closer to Tokyo must be built. Where possible, said the Commanding General, AAF men will be granted leave in the United States, but many and possibly most of them will have to go direct from Europe to the Pacific. Crews will have further training after they reach the Pacific.

Crash Fire Precautions

Recent findings by Office of Flying Safety medical officers show that between five and six percent of all persons receiving non-fatal injuries in airplane accidents are burned to some degree.

Although burns are a direct cause of death in only 2.3 percent of all fire-accident victims, a much larger percentage—75.4—are burned if fire occurs. In 50 selected cases where air crewmen received non-fatal crash burns, 45 were burned on the hands, face, or both. In only five cases were other parts of the body burned without the head and hands being involved. In 30, both head and hands were burned.

Obviously, uncovered faces and hands are most vulnerable to burns. Any sort of covering that can be utilized when fire is present or imminent lessens the danger of burns on these exposed areas.

Habitual use of light gloves, helmet and goggles provides valuable protective covering. Additional protection for the face may be gained by wearing an oxygen mask in case of fire or a crash landing.

Milk Run

The AAF has enriched the language with many new expressions and it is only natural that the home front cannot keep abreast of these additions to jargon and patter. Through the Atlantic City Redistribution Station recently came a pilot of the 15th Air Force. This young man carried a clipping from his hometown newspaper, a cherished memento of his overseas tour. It seems that after one particularly easy mission over Jugoslavia this pilot had said to his Public Relations Officer that "it was really a milk run," and the PRO sent this rather unstartling bit of intelligence to the flyer's hometown paper.

The following week the hometown sheet put this optimistic interpretation upon the message. Across the front page it read: LOCAL BOY BOMBS BALKAN DAIRY FARM.

Destroyer

Ensign Clarence A. Borley, Navy fighter pilot, shot down two Oscars and a Zeke while making a sweep over southern Formosa. A fourth Jap fighter pilot bailed out

as Borley's guns came within range. In a diving run over Takao his plane was shot down and the ensign bailed out into the sea. About an hour after he had hit the water, a small Japanese sailing dinghy set out from the shore to capture the American. But the shooting was not yet over. While they were searching for Borley, he drew his .38 caliber pistol from its holster and knocked one of the Japs out of the bow of the boat. The man fell overboard, presumably killed. The second Jap ran toward the front of the boat and Borley fired at him three times. On the third shot the Jap fell overboard capsizing the dinghy, and he too is presumed to have been killed. The pilot was later rescued by a U. S. vessel.

The Island-Hoppers

One of the oldest heavy bomber outfits in the Pacific, the 11th Group Island-Hoppers rounded out five years of service on the first of February. The group's combat path since Pearl Harbor crosses a map representing nearly half the globe, and today it is grinding down enemy resistance in the Bonin and Volcano islands, flying within 600 miles of Japan.

Many coral atolls ago this group was credited with the first offensive blow of the Pacific war when it struck Lunga airfield on Guadalcanal in July, 1942. Since then the group has moved steadily forward as a spearhead in the massive offensive that has rolled the Japanese back from 16,000,000 square miles of ocean into their own home waters. From all this has come the expression familiar to the 7th Air Force, "one damned island after another."

After suffering heavy losses in the Japanese attack on Pearl Harbor, the 11th Group salvaged what it could of its outmoded B-18s and the Flying Fortresses that had been acquired a few months earlier. The first task was looking for Jap submarines and aircraft carriers. The first blood was an enemy submarine, the first to be sent down in the Pacific by land-based bombers.

Built up to fighting strength by June, 1942, the B-17s ranged out 1,100 miles from the Hawaiian Islands to assist the Navy at Midway in beating off the Japanese task force that threatened to gain a foothold on the strategic island.

A few days later this group, which had been taken into the new 7th Air Force, bore down in a strike on Wake Island. Beginning their odyssey of the Pacific, the 11th was transferred in July to 13th Air Force in the Southwest Pacific. Taking their place in the plan for a combined operations drive northward against the Jap-held islands, squadrons of the 11th were spread out over bases 600 miles apart near the Solomons. Each facing different problems, the squadrons had certain things in common: few airplanes, torrential rains, temperatures as high as 140 degrees, dengue fever, flies, a shortage of equipment, mud and tiresome food.

At the request of General Douglas MacArthur, the 11th left the fight around Guad-

QUESTIONS
on Policy and Procedure

Q. May Wacs be granted furloughs for periods in excess of 15 days to correspond to longer leaves and furloughs of husbands?
A. *Yes, if the exigencies of the service permit. Leaves and furloughs of Wacs married to men in the armed forces, so far as practicable, will be granted concurrently with leaves and furloughs of husbands. Leaves granted to WAC officers will not be in excess of the amount of accrued leave the officer has to her credit. (Sec. III, Cir. 17, WD, 1945.)*

Q. Are former enlisted men who were awarded the Good Conduct Medal during their enlistment authorized to wear the medal (or ribbon) after being commissioned?
A. *Yes, per informal decision of The Adjutant General, 7 August 1942.*

Q. Are temporary appointments as warrant officer, junior grade, suspended indefinitely or entirely eliminated?
A. *Neither. Sec. I, Cir. 375, WD, 1944, stated that "pending the receipt of revised AR 610-15, 15 September 1944, examinations for and appointments as temporary warrant officer, junior grade, under the provisions of AR 610-15, 27 February 1943, are suspended, effective immediately." AR 610-15, 15 September 1944, however, has now been issued and applies. With certain exceptions, listed in these regulations, the Commanding General, AAF, is the appointing authority for warrant officers, junior grade, to fill authorized vacancies within the units of activities under his control. Previously, the Commanding General, AAF, was authorized to delegate this authority to subordinate commanders.*

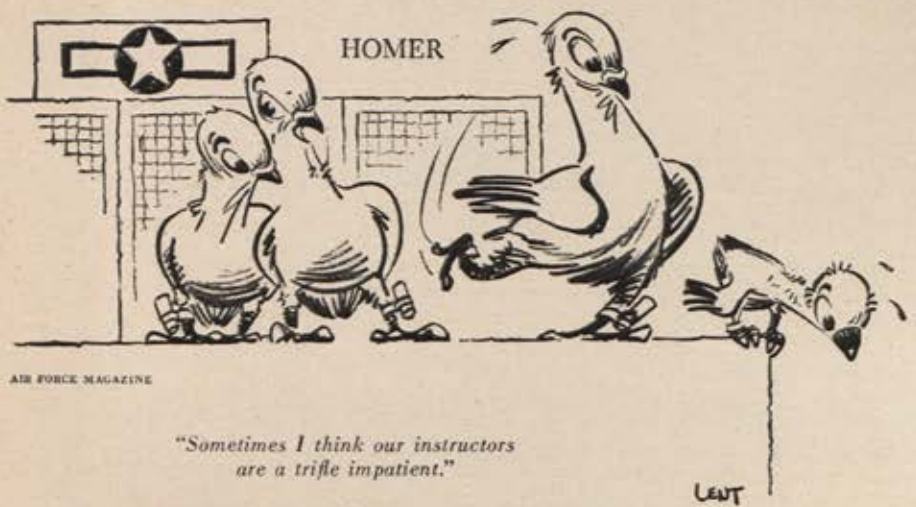
Q. May Army Air Forces pilots apply for Civil Aeronautics Administration pilot certificates and ratings?
A. *A recent amendment to the Civil Air Regulations provides for the issuance of CAA pilot certificate of appropriate grade and rating to individuals holding a currently effective pilot rating issued under the provisions of AR 95-60 while on active duty, provided application is made within the twelve-month period subsequent to being released. To such applicants on active duty, who are on flying status, the Civil Aeronautics Administration may issue either a Private Pilot Certificate or Commercial Pilot Certificate, depending on the qualifications of the applicant, provided the applicant submits a Certificate of Pilot Status and accomplishes successfully the 40-question multiple choice type examination on Civil Air Regulations. All questions are covered in parts 20 and 60 of the Civil Air Regulations. These parts may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., at the cost of ten cents each. For further details, see AAF Ltr. 60-7, 18 January 1945, Subject: "Issuance of Civil Aeronautics Administration Pilot Certificates and Ratings."*

Q. Does a Reserve Officer relieved from active duty have to travel to his home of record to obtain mileage?
A. *Where a Reserve Officer established a home at a place other than his home of record at the time of assignment to active duty, and travels to the new home following his release from active duty, he may be paid mileage for travel actually performed to such place, not in excess of mileage computed on the distance to his home of record at time of assignment to active duty.*

Q. Some enlisted men are not applying for officer candidate school because they believe that their chances for return to a civilian status upon partial demobilization would thereby be impaired. Are such beliefs or impressions justified?
A. *No. The War Department states specifically that "eligibility for discharge or relief from active duty for both officers and enlisted men will be determined by military necessity and the Adjusted Service Rating Card."*

Q. Can graduates of Advanced Army Flying schools obtain Service Pilot's ratings upon obtaining the requisite experience in military aircraft or must the experience have been obtained in civilian aircraft?
A. *Flying time required to qualify for the rating of Service Pilot may be in either civilian or military aircraft. Time flown while undergoing a duly authorized course of pilot training in the AAF may be credited toward the flying time required. However, due to the large number of returnee combat pilots, additional Service Pilots are not needed, and additional ratings as Service Pilot are not being granted at the present time.*

PREPARED BY THE OFFICE OF THE AIR INSPECTOR



"Sometimes I think our instructors are a trifle impatient."

alcanal to strike at Rabaul from Port Moresby, New Guinea. It participated in the battle of Savo Island.

By the time the patched and battered 11th was recalled to Oahu to reorganize as a B-24 unit in March, 1943, most of the aircrews had flown 80 to 100 missions. One plane, the "Yokohama Express," was lost on its 114th mission. However, these missions were shorter than those the Group was to fly later in the Central Pacific. Changed over to Liberators, the group established bases in the Ellice Islands in November, 1943, and squadrons were organized at Funafuti, Nukufetau, and on Canton Island in the Phoenix group.

Crews of the 11th were first into action as the 7th AAF started its offensive against the Japs from its forward bases with a heavy strike against Tarawa from Funafuti on November 13.

Following close on the Tarawa invasion, the 11th plastered Jap bases in the Marshalls, hitting Mili, Jaluit, Maleelap, Wotje and Kwajalein. These were among the longest regularly scheduled heavy bomber missions of the war, many of them averaging 2,000 miles to a round trip. Crews spent from 10 to 15 hours in the air and averaged a mission every third day.

In February, Kwajalein and Eniwetok yielded to our amphibious forces and the 11th moved its bases forward again. For the first time since the island advance began all squadrons were together at one base. While continuing to keep the by-passed Marshalls neutralized, the 11th struck west to begin the neutralization of Truk, Ponape and other targets in what became the by-passed Carolines.

From bases in the Marshalls the 11th bombers struck at the Marianas; Guam, Saipan and Tinian came within the B-24 bombsights. In one strike against the Marianas, the 11th flew one of the longest shuttle bombing missions of the war. Turning away from their targets at Guam, the Liberators swung south across the Carolines to the American bases in the Admiralties and then returned with more bombs by way of Ponape. The mission totaled about 4,000 miles of over-water flying.

In October, 1944, the Liberator squadrons took off for the first time from the Marianas to begin bombing the heavily fortified enemy bases in the Bonin and Volcano Islands. Just in moving its bases the 11th Group has traveled 12,489 miles.

Something for the Girls

First Sgt. Darius King, recently returned from England, struck up an acquaintance with Sgt. Joseph Pry while visiting in Chicago.

"Sergeant King," Pry said, "I want you to come out to my house for dinner. I want you to meet my mother-in-law, my wife and my daughter." King accepted this offer of hospitality and went to Pry's house.

Throughout the afternoon the two sergeants exchanged overseas experiences, Pry having spent 26 months in the Mediterranean. About dinner time Pry told King and the womenfolks that he had a little surprise for them. He took a bundle out of his barracks bag and went to the kitchen. He was busy for 30 minutes preparing food and setting the table with fresh linen and the best silverware. When Pry invited them to dinner—there on the table was a complete meal of C-rations: beef hash, meat and beans, vegetable stew, hard tack and powdered coffee.

"I been eatin' these items for two years," Pry told his family with some emotion. "I want you folks to eat them just once."

CAP Completes Tow Job

One of the least known missions of the war will be concluded on the first of March with the closing of Civil Air Patrol's tow target operations, it has been announced by Col. Earle L. Johnson, the National Commander. All other activities of the 48-State CAP organization will continue as usual.

The tow target work was one of the jobs that CAP, as an auxiliary of the AAF, set up at a time of critical need to relieve Army planes and airmen for combat duty.

Now the AAF is prepared to take over.

The towing of sleeve targets over the fire of antiaircraft guns, the flying of "tracking" missions for aiming practice, and maneuvering at night over the blinding glare of searchlights are missions which call for a high degree of skill, often against serious hazards.

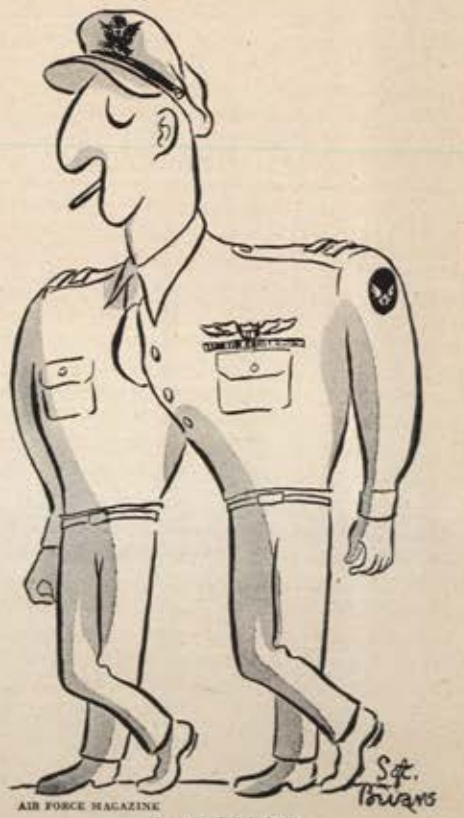
"In this work," said Brig. Gen. W. W. Welsh, Assistant Chief of Air Staff, Training, "CAP's volunteers have made a notable contribution to the training of antiaircraft gun and searchlight crews. This training is essential not only for the defense of our coastal areas but for the sending out of skilled crews to protect airfields and other military installations in the zones of combat.

"All reports from the Army units for which the work has been done are highly commendatory. Performance has met the standards of the AAF itself. It is a job well done."

CAP, founded a week before Pearl Harbor, undertook the towing of aerial gunnery targets as one of its first volunteer missions. Early in 1942, pilots of the Illinois Wing, at their own expense, towed targets over the fire of the guns of Fort Sheridan. This is believed to have been the first time that civilian planes were used for such work.

Toward the end of 1942, regular tracking missions for aiming practice began on the Eastern Seaboard. A year later, several special CAP tow target and tracking bases were set up in the Eastern and Western Defense Commands and were completely manned by CAP members who brought their own planes and equipment. These operations, at their height, employed about 300 men, most of whom were over-age or were otherwise disqualified for combat.

In the CAP tow target and tracking work, over 19,000 missions totalling more than 44,000 airplane-hours were flown.



P-38 PILOT

There were 7 members killed, 5 seriously injured, and 19 CAP planes lost in this work.

Income Tax

The Legal Assistance Division of the Air Judge Advocate's Office advises that conversations with returnees and letters from personnel overseas have pointed up a need for further emphasis on the status of military personnel with respect to their liability under the federal income tax laws. It is strongly recommended that those who did not happen to read "The Hard Facts about Income Tax" in our October issue secure a copy of that issue and see for themselves how the income tax law affects them.

There is quite a difference between personnel serving overseas and those within the continental United States as far as their income tax obligations are concerned. It is definitely unwise for a man overseas to pay any income tax or allow his wife or someone else to file and pay his income taxes for him during his period of overseas service. The man overseas should wait until the 15th day of the 4th month following the month in which he returns to the continental United States before filing returns and making the payments which have accumulated while he was away. Meantime, however, it is a good idea to set aside the approximate amount of tax which is accumulating, so that actual payment will not be too much of a blow financially.

Men serving within the continental United States are subject to the same rules as to the time for filing returns and paying taxes as are civilians, except that if such personnel can show affirmatively that their military service has affected their ability to pay the tax they may request a deferment from their collector of internal revenue. Even if the collector grants a deferment, men within the continental United States must still file declarations of estimated tax and final returns on or before the dates they fall due. Remember, this deferment is not automatic, but must be applied for and granted before it is effective. Men who have returned from overseas can, of course, likewise apply for such a deferment.

It is a safe rule for the wife of a serviceman serving overseas, who is working or has other income of her own, not to claim her husband's surtax exemption on her return or on the form filed with her employer for withholding purposes unless she is absolutely sure that her husband will owe no tax, in which case she should claim her husband's surtax exemption. In filing any return, she should ignore any income of her husband who is overseas and base her return solely on her own income.

If you are overseas, plan to see a Legal Assistance Officer as soon as possible after your return to the continental United States. He'll be glad to give you the assistance you'll need.

Conversation

Lt. Jesse C. Simonds of Rochester, N. H., had just stepped from his plane at a Russian base after a shuttle bombing raid. A

PLANE BONERS

Analyzed by Veteran Pilots

WAYCROSS, GA.—As a P-40 pilot ran up the engine prior to take-off, the plane began to move forward. He applied the brakes to stop the roll but he did not retard the throttle. Consequently, the pull of the prop against the brakes nosed the plane over.

Comment: When an irresistible force tangles with an immovable object, something's bound to happen. Most pilots realize that power and brakes are each other's antithesis—one being used to cause motion and the other to prevent it —and that both are not to be applied simultaneously.

ENGLAND—Returning from a combat mission, a P-47 pilot landed his plane normally and then pulled over to the side of the runway so that he could have a clear view of the plane ahead of him. The Thunderbolt's right wheel slipped from the edge of the strip and dug into the mud, causing the plane to turn turtle.

Comment: Simply a case of pilot error. Shoulders are usually soft and hazardous, and flyers have been warned time and again to keep their planes on the runway.

MCCHORD FIELD, WASH.—The wings of a B-25H buckled when the pilot executed a pull-out too sharply after attaining a speed of 250 mph in diving from 7,000 feet.

Comment: Evidently forgetting that B-25Hs have control boosters, the pilot overcontrolled when he pulled out of the dive. In the overly sharp pull-out, the designed load limit of the plane was exceeded.

AVON PARK, FLA.—The electrical operation for lowering the landing gear of a B-17 had been completed, and the pilot directed the engineer to make a visual inspection of the gear. The engineer reported all wheels were down and locked. After the Fortress had been landed, it could not be turned off the runway. Examination revealed that the plane had been brought in with its tailwheel retracted and that the tail section had been damaged beyond repair.

Comment: Investigation disclosed a blown-out fuze in the tailwheel retracting motor. Thus the wheel could not be lowered electrically. When questioned, the engineer admitted he had checked only the main gear. He was ordered tried by a summary courtmartial on a charge of negligence.

FRANCE—Ten minutes after taking off, a UC-78 pilot was forced to crashland when both engines conked out. He was injured only slightly but the transport was washed out completely.

Comment: Although this pilot had many hours of training and operational flying to his credit, he disregarded one of his most basic responsibilites by takng off without having his engines serviced.

OKLAHOMA CITY, OKLA.—After a normal approach, an F-5E landed nosewheel first. The wheel collapsed backward and the plane skidded to a stop. The pilot was uninjured but the plane was damaged extensively.

Comment: The attitude of the plane definitely was wrong for landing on a tricycle gear. A nosewheel is not intended to withstand the full initial landing shock. Therefore, the nose must be held high enough to permit the plane first to rest on its main gear and later to settle slowly on the nosewheel.

ENGLAND—Trying to save time, a B-17 pilot ran through his checklist from memory and then took off. As the bomber became airborne, the pilot sensed something was wrong. He cut the switches in an attempt to land but his right wing struck the brick wall of a transformer station, broke off and burned. The crew escaped but the Fortress was a total wreck.

Comment: Investigation revealed that the pilot in checking without consulting his list had overlooked the aileron control and consequently was unaware that it was locked. Correct procedure should never be sacrificed to gain a few minutes.

ITALY—Flying with a full combat load, the pilot of a P-47D attempted to make a tight, 360-degree turn to 500 feet in order to join a formation quickly. The plane stalled, flipped over on its back and dived into the ground. The pilot was killed and the Thunderbolt was wrecked completely.

Comment: A steep, tight turn with a heavy load is always foolhardy. If a pilot must risk high-speed stalls, he should be certain there is plenty of space under him for recovery.

TALLAHASSEE, FLA.—The pilot of a P-40N made a normal night landing and then taxied to the clearly-lighted end of the runway. There he attempted an abrupt, sharp left turn onto a taxi strip. When he jammed on the left brake, however, the plane nosed up. The engine and propeller were wrecked completely.

Comment: A pilot must tread lightly while taxiing. A heavy foot on a plane's brake has led more than one flyer into trouble.

PREPARED BY THE OFFICE OF FLYING SAFETY.

NEW BOOKS

On Aviation Subjects

AT WAR

FIGHTERS UP. *Eric Friedheim* and *Samuel W. Taylor.* An account of combat experiences and between-mission activities of fighter pilots of the 8th and 9th Air Forces. Sale benefits AAF Aid Society. MACRAE-SMITH, PHILADELPHIA.

OUR FLYING NAVY. Concise history of naval aviation, with color illustrations by 7 American artists. MACMILLAN, N. Y.

PILOTS ALL. *Henry Felson.* A story of pilot training and personal combat incidents. HARPERS, N. Y.

TECHNICAL

AIR NAVIGATION, Part Seven, Nautical Astronomy and Celestial Navigation. Another in the series of air navigation texts prepared under the supervision of the Aviation Training Division, U. S. Navy. MC GRAW-HILL, N. Y.

AIRFRAME MATERIALS. *F. S. Stewart.* A description of processes by which lightweight materials are assembled for airframe construction. MC GRAW-HILL, N. Y.

COMFORTIZATION OF AIRCRAFT. *A. A. Arnhym.* Discusses light, air, heat, and flight comfort. PITMAN, N. Y.

METEOROLOGY, a Practical Course in Weather. *G. J. Brands.* Fundamentals and modern developments in synoptic meteorology. MC GRAW-HILL, N. Y.

PARACHUTE TECHNICIAN. *C. A. Zweng.* Manual of instruction for the parachute worker. PAN-AMERICAN NAVIGATION SERVICE, NORTH HOLLYWOOD, CALIF.

PIONEERING THE HELICOPTER. *C. L. Morris.* History and potentialities of rotary aircraft. MC GRAW-HILL, N. Y.

QUESTIONS AND ANSWERS FOR AIRPLANE AND ENGINE MECHANICS. Aviation Research Associates. Compilation of practical and theoretical knowledge for aviation mechanics. MC GRAW-HILL, N. Y.

THE MODERN GAS TURBINE. *R. T. Sawyer.* Study of the gas turbine, including its application as a supercharger and its use in jet propulsion. PRENTICE-HALL, 1945.

YEARBOOKS AND HANDBOOKS

AVIATION ANNUAL OF 1945. *R. M. Cleveland* and *F. P. Graham.* New issue of a yearbook covering all phases of aviation. DOUBLEDAY, DORAN, N. Y.

HANDBOOK TO ARMY REGULATIONS AND OTHER DIRECTIVES ON ADMINISTRATION. *Walter Sczudlo.* A reference book, arranged alphabetically by principal subjects. MILITARY SERVICE PUBLISHING CO., HARRISBURG, PA.

THE AERONAUTICAL DICTIONARY. *T. A. Dickinson.* The latest compilation of aviation terminology with definitions and illustrations. CROWELL, N. Y.

THE AIRCRAFT MANUAL, 1945. *David C. Cooke.* Recent developments in military and civilian aircraft. MC BRIDE, N. Y.

These books are available to AAF personnel through the AAF Field Technical Library Service, which provides for technical libraries at all major institutions. List compiled by the AAF headquarters library.

friendly group of civilians crowded around to salute the crew, and a young Cossack girl ran up to Simonds, navigator, choosing him as her personal hero. "How many Germans have you killed?" she asked eagerly. The navigator, reminded that this was his first mission, was embarrassed at the girl's enthusiasm. This wasn't helped by the kidding remarks thrown at him from his crew. "Go on, tell the little girl," the copilot urged.

"Please do," the girl added. "I will tell you first. As a sharpshooter I have killed 20 today. You must have killed many more. How many have you killed?"

Pilots' Examinations

A recent AAF letter, concerning the examination of pilots and flying regulations, directs that all individuals except command pilots, senior pilots, senior service pilots, pilots holding a currently effective instrument pilot's certificate, AAF Form 8A (Green), and civilian pilots of army contract cargo aircraft who pilot AAF aircraft will be examined at six months' intervals. All pilots, with these exceptions, upon permanent change of station, will be examined at the new station before being permitted to make other than local flights.

Command pilots, senior pilots, senior service pilots, and pilots holding a currently effective instrument pilot's certificate, AAF Form 8A (Green) will be examined at the discretion of the commanders concerned. Pilots returned from combat will not be examined at Redistribution Centers.

They Call Her 'Uncle'

The control tower call symbol UJ61, or in pilot language "Uncle Jig Six one," suddenly became "Aunt Jane six one" when WAC Pvt. Elsa Mood took over the tower microphone at the Midland (Texas) Army Air Field. But the authorities couldn't agree that the advent of a soprano was any reason for a change in the phonetic system so Elsa is "Uncle Jig" to Midland flyers.

Paging Lieutenant Brown

From Maj. Herbert Johansen, our correspondent in the Philippines, comes an account of the unusual experience of an AAF fighter pilot, a lieutenant named Brown.

Forced down in the ocean off New Guinea after an encounter with the enemy, the pilot reached shore about dusk. He buried his Mae West in the sand and concealed himself in the thicket, for he knew he was in Jap-held territory.

Next morning, the pilot heard sounds of beating in the brush and several voices shouting: "Lieutenant Brown, Lieutenant Brown . . ." Certain the voices were not American or Australian and suspicious of a Jap trick, he remained hidden. He couldn't figure out, though, how anyone could know his name or that he was in that area, for he was pretty sure no other flyer, friendly or enemy, had seen him go down.

When later in the day, however, his name was called again, curiosity got the better of him and he emerged to find New Guinea natives were doing the yelling. Addressing the bushmen, he found they knew no English. They responded only by repeating his name and beckoning him to follow them.

Deciding to take a chance, he accompanied the group to a small village. There a bushman, who had learned English at a missionary school, explained that after finding the Mae West with "Lt. Brown" stencilled on it, he had taught the others how to shout the name and had then dispatched them as searchers in all directions.

A short time later, Lieutenant Brown was back at an Allied base, a great believer in missionary work.

Tail Gunner, 53

M/Sgt. Michael Jamrack, 53 years old, 31 years in the Army, is a little unhappy at being kicked out of the service, just when the chow is getting good. Mike, sometimes known as The Sleeve (he has 26 stripes and

So they said "Uncle"

chevrons of various kinds and colors between shoulder and wrist), spent World War I as a machine gunner in the infantry. In this war he completed a tour of missions as tail-gunner in a B-25 squadron in Africa. Now back in California, being crowded out of the Army due to his age, Mike says: "I hope my discharge takes all winter to come through. In all my time in the Army I've never seen such good food." When the discharge comes through Mike is going back to his home town of Lup City, Neb.

The Sleeve

Responsibility

General Arnold's recent letter on the subject of "Continuing Responsibility of ALL AAF Personnel," is reprinted here to give additional circulation to the commanding general's attitude on a matter of growing importance in the Air Forces:

1. I want to impress on all officers and men of the Army Air Forces, both those who have returned from overseas and those who have not had the opportunity for service in an active theater, the urgent necessity for hard and continuous work. The resources of our country are not unlimited; and we must each of us devote ourselves unstintingly to our duty wherever assigned.

2. Those who have experienced the rigors of combat service must adapt themselves to frequently less stimulating duties in the United States. This is acknowledged to be difficult; none the less it can and must be done whole-heartedly.

3. There remain in the United States many thousands of highly qualified officers and men who have not yet had the opportunity for combat service. It is my intention that these officers and men shall have service in an active theater. To accomplish this objective will require their replacement by personnel returned from overseas. I shall expect commanders of all echelons to insure expeditious action to attain this objective.

4. Within the framework of the continental commands you must place combat experienced personnel in positions commensurate with their grade and ability. These officers and men have demonstrated in combat the highest soldierly qualities. They deserve and are entitled to continue giving devoted service. Temporary maladjustments, due to nervous and physical strain over an extended period of time, must be recognized and handled with a high degree of leadership. Where retraining is necessary, you will see to it that no time is lost in accomplishing such training.

5. Good discipline is essential to the military establishment. Good discipline includes acceptance and top performance of assigned duties regardless of personal desires. Commanders, combat experienced personnel, and those not yet having overseas service must all remember this fact. The commander must remember that he is commanding men; the men must remember that they are men; it is a mutual responsibility.

6. It will probably be inevitable that physically and professionally qualified officers and men will be assigned to more than one combat tour. It is, therefore, imperative that where practicable no effort be spared to provide one combat tour for all qualified before the inexorable demands of war require the return of the combat veteran to an active theater.

7. I shall give this matter my continuing attention; and it will be the subject of inspection and inquiry by senior staff officers of this Headquarters during field visits.

8th Air Force leader plane—not the whole 1,500,000 gallons

Reverse Lend-Lease

During the first six months of 1944, during the aerial build-up to D-day, English industry supplied 425,000 ship-tons of critically needed items that helped make possible the constant pounding of Occupied Europe.

To keep U. S. Air Service Command repair depots operating at peak efficiency, the British supplied more than 2,500,000 separate items of engineering and shop equipment, according to Brig. Gen. Junius H. Houghton, director of supply for the Air Service Command in Europe. In addition, American planes are flying with more than 50,000,000 British rivets in their bodies and are covered with almost 1,500,000 gallons of British paint, dopes and varnishes.

Other figures include: well over 1,000,000 British spark plugs, used in P-51 fighters alone; almost 400,000 auxiliary fuel tanks, vital to long range fighter aircraft; about 30,000 suits of body armor to protect American airmen from German flak, and almost 5,000,000 feet of fabrics, ropes and cords used in aircraft repair.

To improve the accuracy of U. S. aerial gunners, the British in the past year provided more than 6,000,000 clay pigeons and 4,500,000 shotgun shells for target practice.

Closest Coordination

Cooperating with a Chinese drive on Lungling, pilots of "Flying Horse" Fighter Group dropped a bomb squarely on a heavily fortified Jap gun emplacement while the advancing Chinese hugged the ground but 25 yards away. After this action the Chinese inched forward with identifying panels on their backs to mark their positions. The planes then swooped down repeatedly to strafe a matter of yards in front of the troops. This combined land and aerial attack proved too much for the Japanese who had originally intended to make a stand to the last man. They broke and ran in an attempt to escape the planes and infantrymen. When the pilots returned to their advanced base they found a commendation awaiting them from the commanding general. The enemy position had been taken and not one Chinese soldier had been injured during the extremely close aerial coordination.

Miracle Man

Lt. Wallace G. Montague, 20-year-old veteran of more than 100 missions in the Southwest Pacific, is known among fellow pilots as "the man who forgot to die." Lieutenant Montague, of Baltimore, survived a 1,300 feet parachuteless fall into the ocean and survived.

Montague said he had been forced to bail out of his plane when his engine exploded. "The whole plane was in flames," he said. "I pulled the ripcord and the chute failed

TRAINING AIDS

Newly Standardized for Field Use

FILMS

REMOVAL OF BATTLE CASUALTIES FROM AIRCRAFT (TF 1-3355)—Shows correct methods of removing air combat casualties from various aircraft, using standard, semi-rigid and improvised litters. Running time: 14 minutes.

B-17F ENGINE REMOVAL (TF 1-3728)—Formerly listed as AF-185. Routine engine change on No. 2 engine, including step-by-step stripping of engine. Running time: 17 minutes.

B-17F ENGINE BUILD-UP (TF 1-3729)—Formerly listed as AF-186. Detailed step-by-step procedures for preparing new engine for mounting on plane. Running time: 22 minutes.

THE REMOTE INDICATING COMPASS (TF 1-3722)—Operation, testing, installation and compensation of compass. For personnel in depots and sub-depots. Running time: 30 minutes.

NAVIGATION GROUND MISSION, PARTS I AND II (TF 1-3431)—For navigator's schools only. Simple photographic coverage, without sound track, of navigation problem. Running times: Part I, 55 minutes; Part II, 50 minutes.

PUBLICATIONS

PRECIPITATION STATIC (AF Manual No. 40)—Down-to-earth information on what this atmospheric phenomenon is and how to defeat it.

SHOOT THE BULL (AF Manual No. 1, revised)—Fixed gunnery testing aid for study of range estimation, angle-off estimation and deflection allowance by fighter pilots.

AIDS FOR NAVIGATORS AND BOMBARDIERS (AF Manual No. 41)—Suggestions for improving target and terrain identification.

NEW PUBLICATIONS CATALOG—Lists more than 200 titles of training publications available for AAF use.

FIRST AID IN FLIGHT (AF Manual No. 45)—Compact, simplified briefing on life-saving during flight. Is to be part of "Kit, First Aid, Aeronautic," found in both Army and Navy planes.

INSTRUCTOR'S MANUAL FOR PHYSICAL RETRAINING (AF Manual No. 24)—Common causes of military disability and techniques of physical therapy most suitable for each. For physical instructors in convalescent training program.

SIT DOWN AND PLAY (AF Manual No. 29, Book I)—A handbook of elementary piano playing for the convalescent soldier. Obtainable through Air Surgeon's Office.

GRAPHICS

"ONE MAN LIFE RAFT" and "EMERGENCY SUSTENANCE KIT, INDIVIDUAL BAIL OUT RATIONS"—Although not the latest of their kind, these two single posters will be found valuable while new posters showing later models of similar emergency equipment are being developed.

MAKE AND PLAY YOUR OWN MUSICAL INSTRUMENT—Poster series comprising complete plans for building the "Xylette," miniature piano to be used with music instruction handbook, "Sit Down and Play" (AF Manual No. 29, Book I). Obtainable through Air Surgeon's Office.

A-26 DITCHING POSTER—Illustrates four major phases of ditching, namely, flight positions, ditching attitude, braced positions and exit procedure, and gives specific directions for those crew members concerned in each phase.

RECOGNITION

RECOGNITION OF AIRCRAFT IN SEARCHLIGHT BEAMS (Aircraft Slide Supplement No. 9)—Now being distributed to using activities in accordance with requirements received from all Air Forces and Command headquarters, both domestic and overseas.

Information on the availability of training aids listed in this column, unless otherwise indicated, may be obtained from the chief, Training Aids Division, Army Air Forces, One Park Avenue, New York 16, N. Y., upon request through channels.

to open. I made a free fall of 1300 feet and landed feet first in the water. I went under about 30 or 40 feet, then began struggling toward the surface. I pulled my cords to inflate my life vest, then passed out."

About five minutes later a Navy motorboat picked up the pilot, gave him a dose of morphine and took him ashore. Examinations showed that Montague's left lung had collapsed, but doctors predicted it would return to normal. Other than this he suffered only a twisted ankle and a few bruised muscles.

Getting Tough

The 4th Air Force has inaugurated a course at Camp Pinedale, near Fresno, Calif., designed to refresh officers in all phases of administration and the handling of troops, with strong emphasis on their conditioning and physical improvement.

The schedule calls for more than 300 hours of schooling a month and operates on a seven-day week. In addition to the usual classroom subjects, there is a two-day field compass problem, 100 miles of hiking, training in hand-to-hand fighting, bayonet drill, a sham battle, swimming and water safety, pole climbing, wire laying, and practice in digging foxholes and slit trenches.

These outdoor activities, combined with a two weeks' bivouac in the mountains, have been the means of graduating many officers much better fit for field duty than they were before the hardening process began. The program, now being enlarged, is under direction of Maj. G. V. Underwood.

Odds: 100 to One

Can a single Superfortress defend itself against persistent fighter attacks? Is an airplane the size of a B-29 maneuverable enough to take good evasive action? In heavy bombers, a lone plane is duck soup—doesn't the same situation apply to the very heavies—only more so?

For some remarkable answers to these questions, trace the flight of a China-based B-29 which went on a photographic mission over Japan. The Superfort was so new that a name had not yet replaced its number; its pilot had never been under fighter attack before. The two previous reconnaissance flights by other B-29s had ended in crack-ups in which 11 men were killed.

Superfortress #582—the nameless one—ran into bad weather, and a thick overcast at 5,000 obscured the indicated target area. Some pictures were made of a target of opportunity—which turned out to be an important dyestuffs plant—and the B-29 turned for home. It was a routine mission.

But the Japs weren't passing up the opportunity of getting in a couple of licks at an unaccompanied B-29. Cpl. William L. Douglas, tail gunner, called off the first ones. "Nine fighters at six o'clock. Coming in fast."

A formation of Tonys and Zekes drew abreast and then raced pass the Superfort. Maj. Charles Eiggerman, the pilot, nosed down his plane to gain speed. The fighters came in from one o'clock and Eiggerman

turned into the attack. The forward turret gunner opened with his four 50s and a Tony dropped off and went down in smoke. Eiggerman kept pushing head-on into the attacks, refusing to make a straight and level run for it, thereby giving the Japs an easier target. The Japs were flustered; they split up, unable to improvise against a Superfortress doing the head-on flying.

A Tony made a pass from nine o'clock low and Sgt. David Sagoy, left blister gunner, nailed it with a couple of bursts. Three more approached from eleven o'clock level. Eiggerman nursed the plane around into the attack and the forward turret gunner disintegrated a Zero at 200 yards dead ahead. The six remaining fighters pulled away, apparently short of gas, but 15 more climbed to continue the assault.

The new fighters made individual attacks from every position on the clock. Whenever possible, the B-29 turned into them, bringing the combined power of its six forwardshooting 50s to bear on the enemy. On the majority of attacks, the B-29 fired first.

Fifteen Jap fighters converged on the B-29 like so many vultures pecking at a carcass. Two pulled ahead and waited to make coordinated attacks from either side; Eiggerman throttled back and threw off their timing. The tail gunner called two more screaming up from six o'clock low; Eiggerman jammed on the power, varying his speed as much as 50 mph. A single Zero climbed to rake the bottom; Eiggerman nosed up. A Tony barrelled in from seven o'clock; Eiggerman nosed down, changing his altitude by as much as 1,000 feet. Nothing violent. Nothing too sudden. A slight, gentle turn was enough.

Suddenly, the Japs turned and left. After a running fight for an hour and a half, they were obviously short on gas. With the skies cleared, the crew relaxed. Gunners checked their ammunition. The navigator brought his log up to date. The heavy flak suits were taken off. Somebody broke out thermos jugs full of fruit juice. The attack was over.

Then the tail gunner called over the interphone. He said calmly, "There are about 75 to 100 Japs climbing fast from 4,000 feet below us."

Eiggerman, just as calm, asked, "What did you say?"

Douglas repeated and allowed that maybe he had overestimated. "There might not be more than 70," he said.

Seventy Japs against a lone Superfort. Against a Superfort already low in ammunition. Against a very tired crew.

The Japs peeled off in line astern, and kept coming. Eiggerman had the light touch of a fighter pilot as he maneuvered his more than 40-ton airplane. He pushed up the nose, and then turned it down, almost with the same movement. He went to the right to meet an attack, then carefully swung around to head into a fast pass from the left.

Crewmen used up their small ammunition supply grudgingly. Some Japs hung back and fired from maximum range; others closed in, trying to get point blank shots. There were so many of the enemy that they got in each other's way.

The attack continued for 35 minutes. Eiggerman realized that he had only enough gas to fly straight home—he could not use up any more fuel in taking evasive action. As he throttled back to thin the mixture, the tail gunner called, "The Japs are leaving. It's all over."

The nameless one had defended itself against persistent enemy attack, lasting a total of more than two hours. About 94 enemy fighters had risen to intercept the lone B-29. *Yet not a single bullet had touched the Superfortress.* There was no battle damage. No American had been hurt.

HOMER

"ATC can keep their damned North Atlantic route!"

HOW SHARP ARE YOU?

QUESTIONS

1. What plane is shown in the picture?
2. How many guns are visible?
3. How many crossbars are there on stand at left?
4. Where is the helmet of the man bending over the engine?
5. Where is a canteen shown?
6. Which man is wearing a watch?
7. Are both men wearing first aid pouches?
8. How many cannon cleaning rods are shown?
9. Which man has his sleeves rolled up?
10. On which stand is an oil can?

ANSWERS ON PAGE 60

Parachutes

LOST

No. 41-40252, B-7 type; return to the 78th AAF Supply Officer, Selman Field, Monroe, La.

No. 42-147974, seat type; return to AAF-391-SO, Army Air Base, Abilene, Texas.

Nos. 42-22-784, 42-416564, 42-333200, 42-467367, 42-264018, 42-781235, 42-220847, 42-85226, all seat type; return to 320th Troop Carrier Squadron, Wendover Field, Utah.

Nos. 42-239727, 42-285076, 42-371246, all seat type; return to Commanding Officer, Merced Army Air Field, Merced, Calif.

No. 42-389533, seat type; return to Post Operations Officer, Midland Army Air Field, Midland, Texas.

Nos. 42-785425, 42-426590, 42-296019, 42-316443, 42-785684, 42-786118, 42-277629, seat types; return to Parachute Department, Ellington Field, Texas.

Nos. 42-230985, 42-297823, both QAC type; 42-450631, S-1 type; return to 11th Tactical Reconnaissance Squadron, Lafayette Army Air Field, Lafayette, La.

Nos. 42-392642, 42-420580, 42-447989, 42-453553, 42-672851, 42-275567, 42-1036946, return to Base Operations Office, Alliance Army Air Field, Alliance, Neb.

Nos. 42-426446, seat type; 43-54314, QAC type; return to Headquarters, AAF Western Flying Training Command, Orange County Army Air Field, Santa Ana, Calif. Attn: Maj. John P. Couch, Airdrome Director.

No. 42-466169, type S-1; return to Dale Mabry Field, Tallahassee, Fla. Attn: Maj. Paul B. Gambonini, Operations Officer.

Nos. 42-461771, 42-221925, 42-660059, 42-659864, 42-694344, 42-659860, 42-659852, 42-123169; return to Base Operations' Parachute Pool, Malden Army Air Field, Malden, Mo.

No. 42-5968; return to Cochran Field, Macon, Ga. Attn: Operations Officer.

FOUND

No. 42-204671, seat type; held by Coffeyville Army Air Field, Coffeyville, Kan.

Correction

In the article "Shock Waves at 600MPH" in the February AIR FORCE, the omission of six words from a sentence resulted in an erroneous explanation of the effect of shock waves on aircraft stability. As published, the third paragraph on Page 31 of that issue implied that formation of a shock wave on the wing shifted a plane's center of gravity. This, of course, is impossible since the CG can be changed only by shift of weight within the plane itself. We quote below the corrected paragraph with the six missing words italicized:

"With the formation of a shock wave on the wing, the lift on the wing will be greatly decreased. This will affect the stability of the plane *in the same manner as shifting* the CG to a far-forward position, make pull-outs difficult."

Banzai at Burauen

(Continued from Page 7)

for reasons of safety. It was a new kind of war for an air force general but "Whitey" as the tank boys were calling him within a few minutes, took to it like a duck to water.

He squeezed into the telephone compartment of a half track, inspected the defense lines, snapped orders to headquarters over a direct line strung under fire by tank communications men. When it was all over, Major Daniels paid General Whitehead the highest compliment he knew. He said, "The General would make a damned fine tank commander."

More infantry and artillery were brought in. Parties combed the hills beyond Burauen, annihilating Japs by the score. Reports came in every hour; 26 Japs killed a mile to the north, a hundred bottled up in a cave to the west with an airborne company waiting grimly and patiently for them to come out. Straggling Jap infantry and paratroopers were being thoroughly and systematically wiped out to the east and west, to the north and south.

The few prisoners taken revealed the paratroopers were fanatics, volunteers for a suicide mission the nature of which was not specified when they joined. They had been in Formosa, were flown to Manila the day before the attack. They were excellently equipped, a typical paratrooper carrying an 8 mm tommy gun of a new type, an 8 mm pistol, 8 M-97 grenades, 2 smoke candles, a bayonet, a case with tommy gun clips, a case containing two Molotov cocktails, one magnetic mine and case with spare parts, a parachute, a set of waterproof clothing, pieces of rope, a sack of rations, a canteen. Some carried radios, demolition equipment of new and unusual types, folding-type rifles.

Seven of the dead were found to have either American military or civilian clothes under their uniforms.

The 5th Air Force had come through three enemy attacks, in five days. Weary, battle scarred, hurt, it sat back, licked its wounds. Headquarters men, signal men, ordnance men . . . men of the statistical unit, the special service unit, the air force band . . . men who had long since decided they would never see direct combat with the enemy had suddenly been called upon to fight. They fought well, well enough to stop a fanatical enemy; well enough to take a new pride in their "non-combatant" organization.

The trophy is already available, a Jap battle flag and two Jap rifles, presented by the doughboys of the beloved infantry company. The flags and rifles were mounted on a board bearing the 5th Air Force shoulder patch in one corner and the doughboys unit insignia in the other, with the motto, "WE LEAD."

An appropriate presentation ceremony was held on Christmas night and everybody was happy except for one thing. Someone had spread the rumor that the Japs had captured the PX.

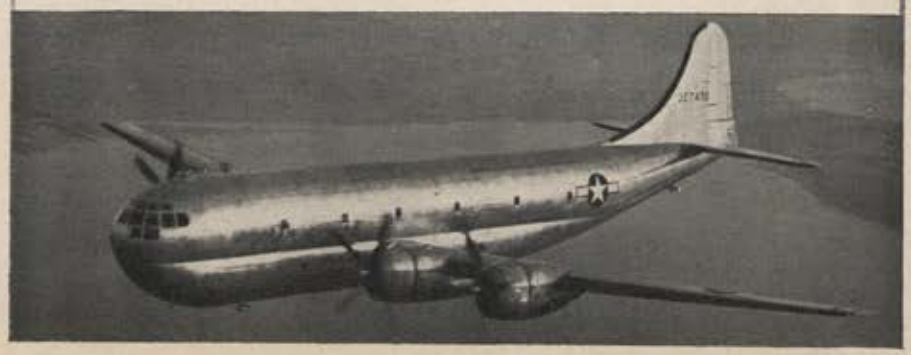
"A black and dastardly lie," declared a 5th Air Force spokesman. "We haven't got a PX." ☆

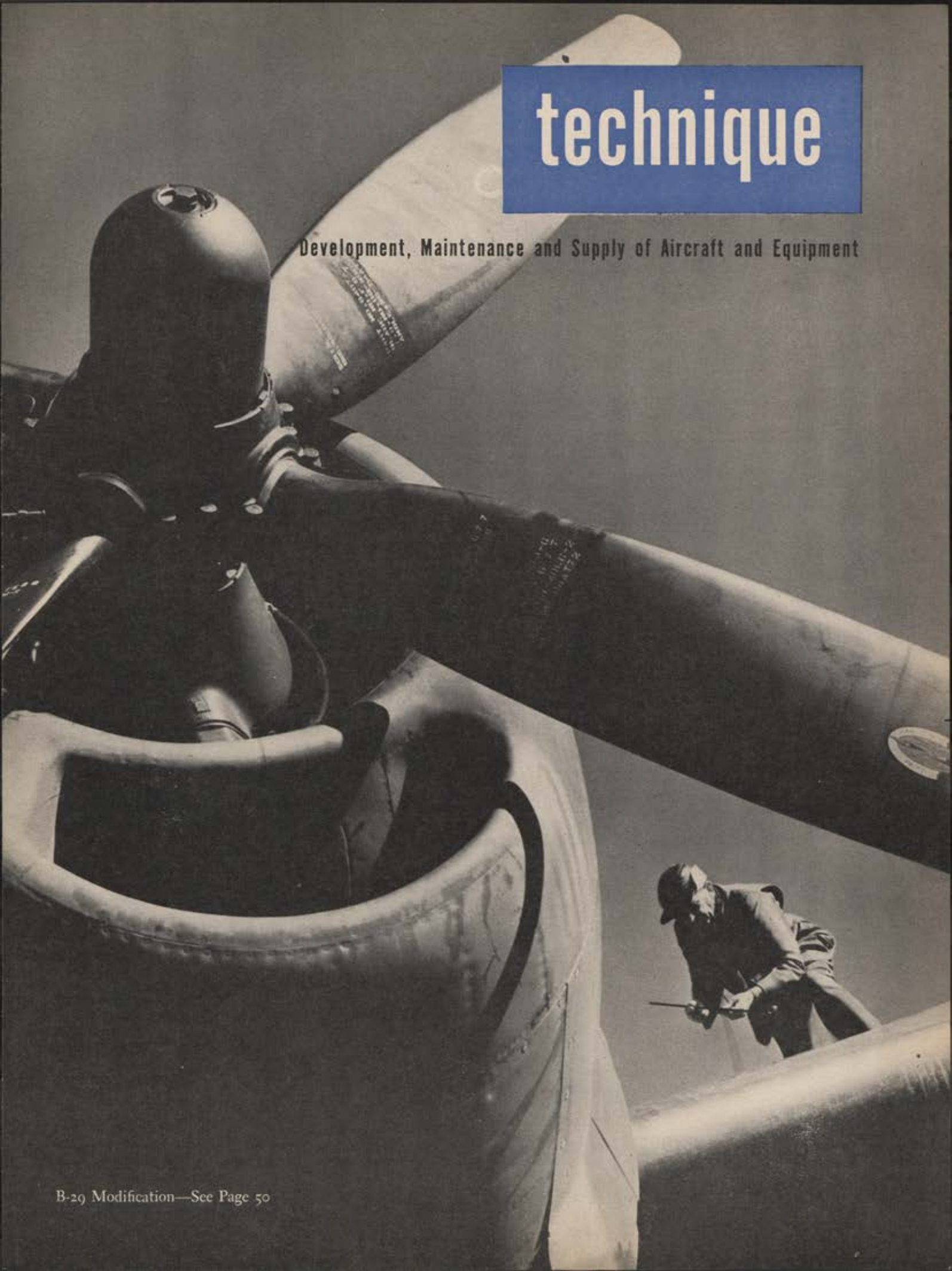
AAF QUIZ

WHAT'S YOUR AIR FORCE I.Q.?

Five points for each correct answer. Above 90 is tops; 75 to 85, good; 60 to 70, not too bad; below 60, tsk, tsk. Answers on Page 59.

1. China-based B-29s' first target was
   - A. *Yawata*
   - B. *Tokyo*
   - C. *Bangkok*
   - D. *Nagasaki*
2. The P-59 is a
   - A. *Twin-engine fighter*
   - B. *Rocket propelled fighter*
   - C. *Glider towing fighter*
   - D. *Jet propelled fighter*
3. The Commanding General of the 21st Bomber Command is
   - A. *Maj. Gen. Millard F. Harmon*
   - B. *Brig. Gen. Haywood S. Hansell, Jr.*
   - C. *Maj. Gen. Curtis E. LeMay*
   - D. *Maj. Gen. Kenneth B. Wolfe*
4. Mandalay is located in
   - A. *Burma*
   - B. *China*
   - C. *India*
   - D. *Thailand*
5. The designation of Special Services Division has been changed to
   - A. *Activities Division*
   - B. *General Services Division*
   - C. *Personnel Services Division*
   - D. *Morale Division*
6. AAF awards are given to personnel of other nations
   - A. *True*
   - B. *False*
7. When an engine is idling with throttle closed
   - A. *The idling jet is also closed*
   - B. *The accelerating jet is pumping*
   - C. *The mixture control is open wide*
   - D *The main jet is idle*
8. The Jap plane Kate is a
   - A. *Single-engine three-place torpedo bomber*
   - B. *Twin-engine multi-place bomber*
   - C. *Single-engine single-place fighter*
   - D. *Twin-engine single-place fighter*
9. The distance in statute miles from Manila to Hong Kong is approximately
   - A. *1,350*
   - B. *700*
   - C. *1,600*
   - D. *400*
10. The B-29 ordinarily carries how many men in its crew?
    - A. *11*
    - B. *10*
    - C. *9*
    - D. *12*
11. On the Standard Instrument Panel, the turn indicator is to the right of the flight indicator
    - A. *True*
    - B. *False*
12. The first landings on Leyte in the Philippines were made on
    - A. *Nov. 6, 1944*
    - B. *Oct. 20, 1944*
    - C. *Sept. 12, 1944*
    - D. *Dec. 4, 1944*
13. Korea is located
    - A. *In the South China Sea*
    - B. *At the tip of Manchuria, between the Sea of Japan and Yellow Sea*
    - C. *In the Gulf of Siam, below Hainan*
    - D. *Between Japan and Formosa*
14. Enlisted men are required to salute enemy officer prisoners
    - A. *True*
    - B. *False*
15. An air-cooled system is lighter per horsepower than a liquid-cooled system
    - A *True*
    - B *False*
16. Ladd Field is located at
    - A. *Fairbanks, Alaska*
    - B. *Cairo, Egypt*
    - C. *Chungking, China*
    - D. *Brisbane, Australia*
17. The shoulder patch of the 20th Air Force bears a B-29 replica
    - A. *True*
    - B. *False*
18. The P-63 is a modified version of
    - A. *P-51*
    - B. *P-39*
    - C. *P-47*
    - D. *P-40*
19. Time served as a pilot in the air forces of a co-belligerent may be counted in computing service as a pilot in the AAF
    - A. *True*
    - B. *False*
20. Identify this plane ↓

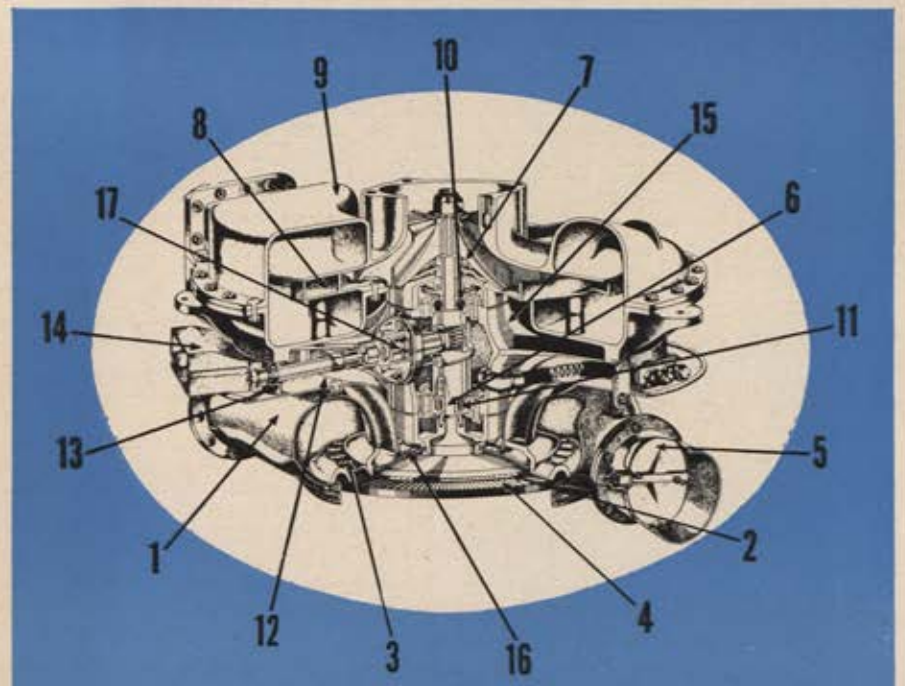




technique

Development, Maintenance and Supply of Aircraft and Equipment

B-29 Modification—See Page 50



Exhaust stack connects to nozzlebox (1) above turbine wheel (2). Heated gases escape through nozzles (3) and are directed against buckets (4) to rotate turbine wheel, while gases not required go through waste gate (5). Power is transmitted by shaft (6) to impeller (7) and diffuser (8) which are enclosed in housing (9) that collects compressor air from diffuser. Ball bearing (10) takes thrust load of shaft, while a roller bearing (11) allows for shaft expansion. Between baffle ring (12) and compressor case, cooling shroud (13) injects air through inlet (14) to circulate around the bearing-and-pump casing (15) and down to sealing ring (16) then up and out of nozzlebox. Lubrication is performed by oil pump (17) while cooling of turbine wheel is accomplished by slipstream air from cooling cap. The diagram below shows two B-11 turbo-superchargers.

Progress in Superchargers

The supercharger does the same thing for an airplane engine at high altitudes that an oxygen mask or pressurized cabin does for a pilot or crew member under similar conditions—allowing it to "breathe" normally in the thin, rarified atmosphere by forcing great power-producing quantities of air at sea-level pressure into its carburetor. As such, it has made a major contribution to AAF superiority by permitting our planes to perform efficiently at high altitudes and by aiding in the development of jet-propelled aircraft.

Basically, there are two types of superchargers. One is gear-driven by the engine itself, either directly or through clutches, and functions as a small centrifugal compressor built into the power plant. It can make an engine behave normally at 15,000 to 20,000 feet, but it is most effective only at the precise altitude for which it is geared. The turbo-supercharger, on the other hand, requires far less drain on an engine's power and affords maximum capacity over a wide range of altitudes, thus giving a decided edge in combat.

Turbo-superchargers consist of a turbine wheel, impeller, nozzle box and compressor case. They operate by conducting the exhaust gases from the engine to the nozzle box, thence through nozzles to the turbine wheel around which is the atmospheric pressure of any given altitude. Exhaust gases, discharged from the engine, expand through the nozzles and buckets and produce sufficient power to whirl the turbine wheel at 20,000 to 30,000 rpm. On the shaft with the turbine wheel is the impeller of a centrifugal compressor which turns at the same rpm as the turbine, raising the air pressure from the operating altitude to sea-level pressure and delivering this compressed air to the carburetor. Air intake and exhaust, therefore, are performed at normal operating pressures, and the engine is able to function at sea-level regardless of altitude.

At present, new designs in turbo-superchargers are being effected to create more power, and technicians are working out means to gear this excess horsepower directly to the propellers, as an auxiliary boost. In addition, the "turbo-engine" can provide a powerful jet, allowing a pilot to climb to high altitudes, feather his props and switch to jet propulsion.

Substantial progress has been made recently along these lines with the discovery and application of new heat-resistant metals, made necessary by the

high temperatures and velocities produced by the 32,000 rpm of the turbine wheels. Manifolds and small turbine buckets were getting red hot, while the compressor on the same drive shaft and only inches away, had to withstand temperatures as low as 70 degrees below zero. A tough alloy was required, therefore, to resist the strain of excessive centrifugal force and retain its strength at high speeds and extreme temperature variations. A new metal alloy was developed composed of chrome, cobalt, tungsten, titanium and other substances and, after extensive tests, was adopted for production.

Types of turbo-superchargers now going into our aircraft are classified in categories according to the horsepower ratings of the engines with which they are used. For instance, a B-type supercharger is employed with engines rated up to 1,200 hp and is installed on B-17s and B-24s. Superfortress engines, developing 2,200 hp, have two of the B-type superchargers operating in parallel. C-series turbos are adapted to engines rated between 2,000 and 2,800, such as those on P-47s, while very large planes like the B-19 use the CM and BM turbo-superchargers. Mounting is accomplished on both in-line and radial engines, either on top, on the side or on the bottom of the engine, provided necessary cooling can be effected.

It should not be assumed that a turbo-supercharger increases an engine's horsepower at high altitudes; it merely maintains its best operating efficiency. In the case of some P-38 engines having combined ratings of 2,850 hp at sea level, it was found that they lost fully 60 percent of their power at 25,000 feet without supercharger installations. With the turbo, however, they were able to pull optimum horsepower six miles above the earth.

Lightweight Landing Mats

Aluminum landing mats, weighing less than half as much as old type steel strips have been developed for airborne delivery to advanced flying fields. The lightweight, portable sections are laid in 10-foot "planks," each of which is about 15 inches wide, and are held together with slide locks.

The new mats are made of 0.188-inch thick aluminum sheet, with a yield strength of 35,000 pounds per square inch. They are ribbed for increased stiffness and pierced with flanged holes to reduce weight. One section weighs 30 pounds as compared to the 70-pound weight of the steel mat section used in previous airfield construction.

tech topics . . . about aircraft and equipment

A body harness which permits pick-up of personnel from life-rafts is being adapted to helicopters that will have mechanical hoists for pulling survivors aboard. . . . A small tailplane surface has been adapted to one type helicopter to help stability and control.

Parachute test dummies now being fabricated have special instruments built into them for recording rate of fall and oxygen pressures at various altitudes. . . . A tough plastic material is being used to increase the rigidity of parachute packs mounted in aircraft at egress stations. . . . Improved ripcord housing with smooth interior bore at the ends and inner lining is now standard for both Army and Navy chutes. . . . Neoprene rubber seat pads for parachutes are being tested to replace present pneumatic type, which costs twice as much.

New flight instruments have been developed for the helicopter. Special gauges to record forward, backward and lateral motions of the craft and air speed indicators to show zero and reverse speeds have been perfected by instrument engineers. . . . New helicopters will incorporate an automatic pitch reduction system. The mechanism operates in response to engine speeds, the pitch of the rotor blades being decreased when the engine drops below a predetermined speed.

The AAF is studying several new types of devices for testing parachutes. One consists of a huge steel tower with a long boom extending outward. At the end of the boom is a parachute dummy. As the boom is swept mechanically around the tower at a speed simulating that of a 400-mph drop, an automatic release opens the parachute and tests it against the opening-impact force to which it would be subjected under actual conditions.

Quickly attachable chest parachutes have been standardized for all airborne operations. These chutes, 24-feet in diameter, permit freedom of movement and are lighter than other types. . . . Metal pack openers for personnel parachutes may replace rubber exerciser cords which sometimes fail, due to loss of elasticity, in cold temperatures. New metal openers have snap feature but still retain desirable flexibility.

A tiny, red lamp on the pilot's instrument panel and a siren-like horn, both controlled by an automatic smoke detector, are parts of a new system to warn pilots and crews of interior aircraft fires. Smoke particles mixed with a steady airstream in a small box chemically actuate the mechanism.

A powerful engine-starter, now in use on some military aircraft is called the "mighty midget." It weighs only 32 pounds and has a five-pound flywheel which kicks over the engines more quickly than conventional starter equipment and packs more power into a smaller space.

Because high pressure oxygen cylinders must be handled with extreme care while loading them aboard a plane, a low-slung, three-wheeled platform with twin clamps to keep the cylinder in place has been designed. The carriages, known as "oxygen trolleys," are hooked together in train fashion so they can be hauled around an airdrome to planes needing refills.

Seventy-five-gallon belly tanks have been converted into containers for aerial delivery of type E-1 life rafts. . . . New spinners for P-51 propeller hubs are being designed to incorporate quick detachable features. The new design will eliminate inaccessibility of nose section retention bolts, a "bugaboo" for mechanics.

Clothes lines: An experimental air blower has been perfected to heat flying suits, which are called "Hot Air Clothes." . . . Helmets made of white cotton twill are being studied for radiant energy as a possible source of heat.

Sample food warmer trays and drinking cups for use on long-range bomber missions are made of stiffened nylon and may replace former metal dishes. A plastic

flask-type beverage container which fits in the knee-pocket of standard flight suits is being developed for fighter pilots.

Handy computer aids bombardier in making quick calculations.

Computer for Bomb Spacing

A bomb spacing calculator to augment the bombsight and insure proper setting of the intervolmeter, which releases bombs in salvo, individually or in train, has been devised by the Applied Mathematics Panel of the National Defense Branch Council in collaboration with Armament Laboratory personnel of ATSC. The computer is in the form of a circular slide rule and solves the complicated equation for direction of attack, aiming error, altitude, size of target and number of bombs to be dropped. Correct spacing of bombs can be obtained by an expert bombardier in 15 seconds, and can increase probable hits by as much as 50 percent in certain situations.

At present, these spacers are being used by 8th Air Force bombardiers in the ETO, but operations officers on the ground also use the disc to determine the number of bombs needed and the number of planes required for the destruction of a particular target.

B-29 Modifications

From the time the B-29 first reached maintenance lines, many modifications have been instituted, ranging from propellers to rudder, and, while they have not resulted in major changes, they have served to increase the effectiveness of the Superfortress.

The early B-29s were equipped with Hamilton Standard propellers, having No. 24F60-13 hubs. Later, however, these hubs were changed to the 24F60-23 type in order to improve high altitude operation. This means that props now have four bleed holes in the piston rather than two, minimizing the congealing of oil in the dome under low temperature conditions. Cam and blade gears have been re-indexed to alter the relationship between blade gear segments before the cam rollers reach the knee in the cam slot. And the feathered position of the piston was moved farther aft to decrease the possibility of having the congealed oil in the dome prevent feathering.

Because the Superfortress "grew as it flew," many modifications were suggested by performances in actual combat tests. It was found that the 2,200 hp Wright engines, while pulling big bomb loads on the long run to Japan, had a limited life expectancy which made frequent engine changes necessary. Diagnosis showed that overheating was caused by inadequate lubrication and misdirected airflow. After six weeks of intensive work at the Oklahoma City Air Depot, however, the engines were fitted with baffling cylinders and ducts to provide better distribution of air and to improve cooling.

Andy's Dandy, first Superfortress to have its powerplant modified, undergoes engine change at its 20th Air Force base in India.

Crossover tubes were installed between rocker boxes to furnish the needed lubrication, and rocker arms were reworked, drilled and gouged out to allow free passage of oil. More recent design changes in carburetion have further improved engine cooling.

Combat performance also proved the desirability of providing the engineer's station with some means of stopping the B-29's auxiliary power plant. This was accomplished by installing a control circuit consisting of switches at the engineer's panel and at the auxiliary power plant, indicator lights, wiring and a relay in the magneto ground circuit. Also on the same instrument board, liquidometer totalizer-type fuel gauges have replaced the liquidometer gauges that incorporated transfer switches in the transmitters. The float arms on the new gauges are lengthened, bringing the floats nearer to the chordwise center of the tanks, where the fuel level is least effected by variations in the pitch angle of the airplane during flight.

The two ignition distributors mounted on the nose section of the R-3350 engine must be kept free of oil to prevent fouling of the finger contacts. On previous models of this engine, the distributor oil seal consisted of a spring-loaded neoprene grommet and collar arrangement. At present, however, Garlock type seals are used at this location to provide more effective sealing and maintenance simplicity.

On the tail of the B-29, an advantageous change in aerodynamic balance was effected by installing a rudder with a triangular leading edge. This permits the use of larger amounts of balance than that of rounded leading edges without destroying the "feel" of the rudder movement.

Acetylene Beacon Light

A light that burns for a year has been developed by the AAF as a warning signal to be placed atop high peaks and other obstacles located in isolated areas over which our planes must fly.

The new beacon (Type C-3) is an acetylene burning lantern assembly designed for installation where electrical power is not available. Its on-and-off action is completely automatic, and once installed it will operate for 365 nights without adjustment or refueling. Components include a base which houses lighting apparatus and filters, a main burner and pilot burners, special optical elements, a flash regulator, acetylene cylinders for fuel supply, and a sunvalve for turning the light on after dark and off during daylight hours.

In operation, a 400 candlepower beam is flashed for .2 of a second, 30 times a minute, and may be seen for approximately 12 miles. Upper and lower lenses with red filters throw the light in a complete circle so that it can be observed by pilots approaching from any direction. The main burner has a

Long-term beacon light is automatically controlled. Shack contains acetylene tanks to fuel lantern nightly for an entire year.

three-cluster flame ignited by two constant pilot lights. Small holes in base permit enough air to maintain flame, while the baffling prevents the light from being blown out by high winds.

The beacon's nightly illumination is accomplished by the sunvalve device, which consists of four light-actuated metal rods, compensated for temperature change, which expand and contract with outside light variations. This produces energy to operate a valve, which governs flow of fuel to main burner.

The long-term lamp has already been installed at several hazardous points near airbase operations. It may also be used as an airway marker.

B-17 Trim Tab Modification

An airfoil-type trim tab was introduced recently on B-17 elevators, replacing the old elevator down-spring in order to provide greater stability back to 35 percent Mean Aerodynamic Chord. The original horizontal stabilizers and elevators were built to furnish stability back to 32 percent, but as loading aft of this became more common, the bulbous tab was adopted as an aerodynamic improvement.

However, as with any device on control surfaces giving greater stability with free controls than with fixed controls,

Trailing edge extension for elevator trim tab assembly. Reference may be made to AAF drawing 14-3638, sheet 2, for construction.

maintenance tips . . .

from the crew chief's stand

Bearing down on bearing trouble in HXD engines of C-2 wreckers and F-1 fuel servicing truck-tractors, our experts have traced the difficulties to high engine rpm, low oil pressure and grit entering the crankcase. The following points are suggested to remedy the situation:

1. Set engine governor for not more than the maximum rpm authorized by TO 19-25-78.
2. Check oil level carefully every 100 miles, as outlined in TOs 19-20-16, 19-25-51, 19-25-53.
3. Keep oil in air cleaner.
4. Remove junction box to crankcase heater tube and close openings (see TO 19-1-135) to prevent grit entering crankcase.
5. Check oil scavenger lines for chafing against main oil pressure line and baffle troughs.
6. Keep check on oil pressure. At 400 rpm it should be 15 psi, at 1,600 rpm 35 psi when engine and oil are at operating temperature.
7. If crankshaft must be replaced, make sure new shaft is equipped with the new counterweights.

You can give your oxygen compressor worries the air by employing specified fuel. In many instances, failure of these portable units is due to the use of leaded gasoline, for which the engines were not designed. Officers in charge should see to it that the proper type of white, unleaded gasoline is procured so that operators will not be plagued by recurrent burning-out of compressor engines.

You may have a mechanical mind—but do you remember to wind it up? Necessary details forgotten—like a routine generator check—may result in trouble when the plane gets upstairs. Make certain all pressures and temperatures are within limits and that all flaps, cowl flaps, oil cooler shutters and coolant shutters are in prime operating condition. This is especially important in aircraft equipped with electric propellers but it is equally vital with hydraulic props.

Don't be all wing and no landing gear when it comes to preflight testing. It's fun to imagine yourself soaring over cloudbanks, but keep both feet on the ground

and take your job seriously. On planes equipped with full feathering props, for example, always check the feathering motor for operation. Push in the feathering button at an engine speed of 1,700 rpm and after a drop of 300-400 rpm, pull the button out manually. This insures that the feathering pump is operating properly. Don't full-feather the propeller, however, as this action puts an excessive load on the engine.

Mechanics always like to see their pilots come home safely. For many happy returns, pay particular attention to the magneto check. Test magnetos at low power before giving them the gun at rates usually recommended in order to detect faulty ignition. Never take chances with magneto trouble because a single fouled plug can lead to detonation and subsequent engine failure.

Something you might save for a brainy day is a fuel-consumption checking idea tried out successfully at Pocatello, Idaho. To keep track of performance of both pilots and airplanes in P-47 training, a short, simple form was drawn up to show any marked deviation from normal averages of fuel consumption, giving indication of improper use of power or poor maintenance and bad engine condition. A mimeographed form, spaced for airplane number, type of mission, duration of flight and number of gallons of fuel consumed, will provide the information necessary to indicate when investigation and corrective measures are required.

Here's light on the subject of field expedient runway markers. With two empty sandbags, a standard 5-gallon can of diesel oil, 6 feet of wire and a large nail, a flare may be constructed that will burn for more than 36 hours without attention and will require a king-size typhoon to blow it out. First, roll up the sandbags and bind them tightly with the wire to form a wick. Force the nail through this wick about three inches from its end, like the crossbar of a T, so that it serves as a stopper when you slip the burlap into the opening of the can. To ignite the flare, moisten the protruding end of the wick with gasoline or diesel oil and apply flame. To extinguish, smother with burlap that has been dipped in water.

some tendency to oscillate was anticipated. Various degrees of camber were tested, with the best average being ¾ inch. With greater curves than this and loadings aft of 35 percent, long-period oscillations, which varied in proportion with the airspeed, resulted.

To eliminate the undesirable characteristics of this airfoil-type tab and to prevent the plane's tendency to pitch and oscillate under certain conditions of load, altitude and power setting, the 8th Air Force has recommended a simple remedy which bears the endorsement of Boeing and the ATSC. A strip of .032 inch, 24ST aluminum alloy sheet is riveted on the top of the tab trailing edge so it will extend the length of the tab and project one inch over the trailing edge. The elevator then is rebalanced by adding 1.4 pounds to the counterweight.

Anti-Gravity Suit for Pilots

"I'm damned if I would fly without my G-suit," exclaimed 1st Lt. William Krauss, member of an outstanding P-51 group in the ETO who had just knocked off a couple of German planes. "I had to go through a lot of turns that once would have blacked hell out of me, but the G-suit kept my head clear all the way."

The Berger G-suit, heartily acclaimed by all who wear it, is an overall wrap-around, lightweight, inelastic pair of pants extending from waist to ankles. Supported by built-in suspenders, it is donned in the same manner as a zipper-type flying suit. Five rubber bladders contained in the suit draw air pressure from the exhaust side of the vacuum instrument pump and compress the pilot's abdomen, thighs and calves during aerobatic maneuvers, thus preventing "blackout" by equalizing the G force that opposes the return of blood to the heart from the lower extremities.

Pilot adjusts anti-G suit before flight.

Normal gravity force—or G—on the human body is plus 1G. When this is increased to plus 2G, it means that a centrifugal force equal to twice the actual weight of the man is pulling down on him. And with gravitational force equal to 4G or 5G, reflexes become slower, sight is dimmed, muscular action is lethargic and unconsciousness is not far off.

When there is no undue force, the bladders remain deflated, but during dive pullouts and extreme turns when centrifugal force pushes the pilot against his seat, the bladders are automatically pressurized at the rate of one pound per square inch per G above 2G. By inflating beneath the skin-tight garment in direct proportion to the amount of centrifugal force exerted on the pilot, the

what's wrong with this picture?

We take off from maintenance errors this month and land on problems of supply, with the stress on typical mistakes made in packaging reparable items. Such veteran material deserves the same care as that given to serviceable or new equipment, and improper packaging will ultimately result in shortages on the line. The man in the middle cooly claims to have wrapped up five glaring discrepancies along with the turbo-supercharger, but look for others before checking your findings against the bill of lading on Page 56. The handle-without-care detail includes (left to right) Pvt. Rick Clary, Pvt. Richard M. Nicholls and Cpl. Archie McVay, all of the 4100th AAF Base Unit, Section G, Patterson Field, Fairfield, Ohio.

bladders compress the abdomen, legs and thighs, thus neutralizing the G forces of maneuvers and maintaining an equal distribution of blood throughout the body.

The G-suit is worn over uniform trousers and under flying clothes, or next to the skin beneath the summer flying suit. It is connected to the air supply through a simple quick-disconnect plug beside the pilot, while pressurization and deflation of the bladders is controlled automatically by a spring-loaded weighted valve, according to the amount of G being endured.

Emergency Kit for High Altitudes

The Gallagher kit, which represents a new departure in first aid treatment during flight at high altitudes, has been used successfully in 8th Air Force bombers and has now been adopted for all B-29s. A feature of the kit is the "pressure bandage"—a gauze pad stuffed with packing material with bandage roll attached—which forms a pliant but firm covering for large and small wounds and eliminates all need for the conventional tourniquet. This dressing has been designed for quick, easy application in low temperatures during violent evasive action, when it is difficult to maintain balance. Easily handled by gloved hands, it effectively binds the wound without shutting off the flow of blood and, in the case of broken bones, two or more of these bandages may be used in making a comfortable splint.

A quantity of morphine in the kit is kept in a special, heated compartment which may be opened without removing flying gloves by breaking open a built-in lock. Also included are sulfa drugs, standard-type dressings and a safety knife to facilitate the slitting of heavy clothing when a compression bandage needs to be applied.

Unloading of patients from C-47 hospital plane into waiting ambulance is made easy by means of this canopied ramp constructed from salvage by the 20th Ferrying Group, Nashville,

At the ATC's European Division terminal in Scotland, a wounded American is carried aboard a C-54 by way of home-designed steel ramp. In two parts, botton section alone loads C-47s.

Padded pressure bandage

Kit has new bandages as well as standard types.

The case itself is made of sturdy plastic, curved to fit the contours of bomber and transport fuselages, thus conserving vital space. If the plane is forced down at sea, the container acts as a self-sealing, buoyant life raft which will support the weight of an average man for some time.

Both kits and contents were developed by Col. John L. Gallagher, a member of the staff of Valley Forge General Hospital, Phoenixville, Pa.

Hospital Plane Ramps

Two hospital plane ramps, both designed to load and unload air evacuation patients with greater speed and safety, have been constructed at two major ATC bases in different parts of the world.

At the 20th Ferrying Group, Nashville, Tenn., a C-47-to-ambulance canopied passageway, built entirely of salvaged material, protects litter cases from accidents due to slipping or loss of balance. The steel framework supporting the structure consists of old Vultee tow bars, while a renovated parachute stock pile cover forms the sides and top. Non-skid material is used for the slope of the ramp floor, and three shielded dome lights, taken from a crashed attack bomber and powered by a reclaimed sub-standard battery, provide illumination. The ramp weighs 2,000 pounds and can be moved by one man. A special lock on the retractable wheels holds the ramp solidly in place when in use. It is 22 feet long, 6 feet wide, and 12 feet high at the end which touches the plane.

At an ATC base in Scotland, a steel

on the line

with mechs around the world

Like theatrical road companies making one-night stands, service groups of the 9th Air Force hop from one captured airfield to another near the German border. And a most important piece of equipment at such advanced bases is a good mobile control tower.

Claimed as the classiest in Europe is the tower constructed by S/Sgt. Harthel Scott, Boaz, Ala., Sgt. Mason Winebriner, Hot Springs, Va., and Pvt. Eulon Zorn, Samson, Ala., all members of a P-47 service unit commanded by Lt. Col. George Bibby, Cumberland, Md. Salvaged glider plywood built on a 2½-ton Army truck forms the shack, which is crowned by a roomy plexiglas tower, affording perfect visibility in all directions.

With the regulation kit for testing B-29 electronic turbo-supercharger controls on TD elsewhere, Sgt. Willis Kramer of the 13th Air Force Service Command in the Southwest Pacific had to "make do" with his own setup.

Using a B-2 field lighting case powered by a 24-volt battery, his apparatus incorporates an electronic control system identical with that of the airplane, except for the governor control. Any part of the plane's control system believed to be defective is disconnected from the unit and connected to the test kit. Operation of the boost selector control knob starts the waste gate motor, while the "pressuretrol" simulates changes in the carburetor deck pressure and gives synchronized movement of the waste gate. Separate testing of each element of the plane's control system quickly isolates irregularities.

That famous foundry that S/Sgt. Edward Dillon, Cleveland, Ohio, operates to the advantage of fighter and bomber maintenance crews in the CBI now turns out fully 500 different items cast of brass, aluminum, zinc and babbitt metal. As reported in these pages in May of 1944, the foundry was improvised to mold critical spare parts as they were needed, turning out gears, plates, pistons, sway braces and other tailor-made articles. A prime difficulty in setting up shop was finding a sand that could be mixed with molasses to produce the proper molding solution, but after experimenting with various types of local topsoil, Sergeant Dillon "dug up" a sand of suitable consistency.

Putting things on ice was no problem to Cpl. Edgar W. Chapman, Charlottesville, Va., when a shortage of this useful commodity occurred at his 15th Air Force base in Italy. A former refrigeration engineer, he constructed an ice plant out of wrecked compressor components and salvaged airplane parts. High pressure lines were welded to scrap iron supports and expansion coils were devised from spare tubing. The plant operates at 20 degrees above zero and produces 500 pounds for local requirements.

A self-propelled generator mounted on the chassis of a three-wheel gasoline scooter now provides external electric current for starting airplane engines or for checking radio and other electrical equipment at the Wichita, Kan., airport, headquarters of the Midwestern District, ATSC. The scooter is driven right up to the parked planes, where cables may be plugged in to transmit power. In constructing the vehicle, the scooter's metal toolbox was taken off and replaced with a plywood base. A standard generator with its wheels and handle removed was then anchored to the base and grounded to the scooter frame, with headlamps remounted on the front of the generator. The idea was executed by Millard Terry, Merle Buck and Joe Finck, civilian mechanics at the field.

Stymied by lack of an efficient test stand for Packard - Rolls Royce Merlin engine starters and clutches, men at an ASC depot in England built a test fixture from a Prony brake stand and parts of an engine housing. The rig performs a half-hour job in two minutes and speeds the flow of airplane starter clutches from the depot's assembly line. Removable plate in the rear of the clutch permits adjustment without taking it from stand.

Claiming speed record for P-47 engine change, these 9th AF mechs in Belgium did job in 4½ hours. L. to R. are M/Sgt. Ernest Worle, Lewiston, Ida., Sgt. Bill Schiering, Mt. Healthy, O., and S/Sgt. Ron Zimbleman, Phillipsburg, Kan.

Carburetor floats are in 'hot water' with leak test method devised by Sgt. Warren A. Johnson, Detroit, Mich., at an ASC Depot in England. Float is weighted down in a jar of water, then placed in decompression chamber from which air is withdrawn until 23 inches of mercury registers in manometer. Atmospheric pressure inside float being higher than air inside chamber, bubbles will form in water if there are any leaks in the float.

loading ramp has been fabricated in two 23½-foot sections, each fitted with swivel-type wheels. The bottom section is used to convey casualties into C-47s, while the second section, when connected, reaches the door of a C-54, eight feet above the ground. The ramp is four feet wide.

The Nashville ramp was worked out by Lt. F. A. McGlone, officer in charge of Manufacturing and Repair Section of the 58th Squadron, and George Allen, civilian superintendent of Aircraft Shops, 20th Ferrying Group. The structure in Scotland was constructed by a local shipbuilding company from plans drawn up by air evacuation medical officers and ATC engineers.

Facts by the Square Mile

Word from above, in the form of a shower of Allied leaflets, have been effectively distributed over the Balkans and southern Germany by the 15th Air Force's large-capacity "propaganda bomb," adapted from the M-26 flare.

With a wide territory to cover, it was desired to use a container that would explode somewhere under 2,000 feet with sufficient force to insure the greatest possible dissemination. Italian artillery propellent charges, captured in large quantities, provided the right explosive charge. They were wrapped in individual silk bags and fastened in place just behind the flare's nose fuse and booster. Five and a half rolls of leaflets—with 1,500 leaflets to a roll—were packed in the finished bomb.

The missile with a missive weighs 51 pounds and is sealed with a standard cover and tape. The tear wire is removed from the M-26, and only the swivel and arming wire is used.

In Burma, a leaflet-dropping device has been made by U. S. fighter pilots from a 150-gallon belly tank. A plunger governed by a small electric motor expels the leaflets in bundles, which break open and scatter in the slipstream. If necessary, the pilot can jettison the leaflet tank.

New Bombing Trainer

A portable, life-size model of a bombardier's compartment, complete with Norden bombsight, bomb-rack controls, switches and instruments, now enables a bombardier in training to simulate almost any tactical situation.

Designated the A-6 Bombing Trainer, the device projects a moving terrain area recorded on plates onto an overhead mirror and back to a screen where it appears to the bombardier exactly as he would see it from his station in a

Film of moving terrain is projected onto overhead mirror where image is reflected back to screen below, duplicating bombardier's view. Trainee sits in fully equipped mock-up of bombing station, ready to "release" his simulated load.

bomber. The direction of ground travel is coordinated with the position of the plane at any speed from 125 to 250 mph and at altitudes from 2,000 to 20,000 feet. "Bombs" are represented by a series of tiny lights to the left of the bombardier as he mans his bombsight, and they can be "released" singly, in train or in salvo. Hits are recorded by pinpoints of flashing light on the screen below, but only after an interval of seconds corresponding to the time it would require for a real bomb to fall from the assumed altitude.

Information on this device may be obtained by writing through channels to the Training Aids Division, One Park Avenue, New York 16, N. Y.

Maintenance Contest

A contest to improve production-line maintenance systems was recently initiated at Cochran Field, Ga. A banner is to be displayed in subsection engineering offices for the best maintenance performed each month, and a trophy awarded to the section winning the banner the most times in a six-month period. Scores are based on lowest daily percentage of aircraft out of commission for first echelon maintenance, general condition of airplanes, cleanliness of planes and equipment, and neatness of section areas.

Aeronautical Board Seeks Ideas

The Working Committee of the Aeronautical Board, a joint Army-Navy agency, has asked all AAF maintenance personnel to submit suggestions on aircraft parts which they believe could be standardized for interchangeability on either Army or Navy planes in order to facilitate fabrication methods and effect substantial savings in time and money on contracts. Ideas should be forwarded, through channels, to the Air Technical Service Command at Wright Field, Dayton, Ohio.

If a suggestion is found to be practicable, specifications may be set up to apply to the particular item, no matter how many different manufacturers make it or how many different planes use it, thus simplifying the work of the maintenance man and, in many instances, preventing planes being grounded for want of a special part.

The Aeronautical Board was established by executive order to effect cooperation between the Army and Navy in the development of aviation. Members include General of the Army H. H. Arnold, Maj. Gen. O. P. Echols, Vice Admiral H. W. Fitch and Rear Admiral D. C. Ramsey. The Working Committee is headed by Lt. Col. G. R. Gaillard, AAF, and Commander E. C. Beck, USN.

Absolute Altitude Altimeter

An altimeter that uses radio and electronic waves to measure absolute distances above the ground is being installed in AAF planes to provide a safety factor not available in standard pressure-operated instruments. Supplementing barometric types which record only "above sea level" altitudes, the new instrument acts as a terrain clearance indicator by sending out a radio impulse which strikes the ground and reflects back to the plane. The elapsed time of beam travel is computed automatically and visually registered as absolute altitude on the pilot's instrument panel. In principle, it is similar to bouncing a ball against the floor and measuring the distance by computing known speed of the ball and the time that it takes to hit the floor and bounce back into your hand.

The instrument gives readings of height above terrain on two scales—200 to 5,000 feet and 5,000 to 50,000 feet—as selected by the pilot to suit flying conditions. The system can not be used with accuracy below 200 feet, since it is difficult to compute the difference between outgoing and incoming electronic waves at that altitude. The major components of the altimeter include a combination radio transmitter and receiving set, a sending and receiving antenna, an automatic computer and a dial to show the indications. Instead of a pointer common to ordinary altimeters, the dial has an electronic circle which bulges into an arrow-shaped pip at appropriate altitude markings.

Medium and heavy bombers now carry the instrument on cockpit panels.

Packaging and Corrosion Control

The big problem in AAF supply shipments, particularly in view of redeployment routing from ETO to other bases when the war in Europe is over, is the proper packaging of equipment to withstand all adverse weather and transit conditions, according to Maj. D. L. Batten, Packaging Coordinator, ATSC.

To prevent corrosion, which may take place far from the point of original departure and is difficult to detect, Major Batten recommends the following procedures:

Clean parts not subject to damage by spray or immersion with petroleum solvent, stock No. 8500-908000. Use two tanks, one for immersion and the other for rinsing. Parts which may be harmed in this way should be wiped clean. Dry by hot air blasts. Do not handle parts with bare hands during and after cleaning. Use canvas or rubber gloves.

For preservation of items that can be dipped and cleaned without disassembling, immerse in rust preventive compound, stock No. 7500-054300. After dipping or brushing, wrap part in No. 8700-514760 Grade A grease-proof paper, with red side next to treated item. This is Method I preservation.

For more critical surfaces, such as moving engine parts, Method 1-A preservation is employed, which specifies that after cleaning and application of rust preventive compound, a conforming wrap must be made in Grade C moldable paper (No. 8700-514756) with the smooth side next to the treated part. All flaps should be securely pressed down and No. 7300-827550 sealing wax applied.

Method II preservation is reserved for instruments, intricate assemblies, radio equipment and similar items. Apply a light lubricant to the item and place it inside a moisture-vapor-proof bag, heat-sealing with a small iron. A moisture indicator (silica gel) stock No. 7800-436560, should be inserted inside

of transparent bags before sealing. If suitable bags are not available, wrap item tightly in Grade C paper, place in a box with a drying agent, cover the box with more of the paper and dip in sealing wax.

In general, when time is short and the number of individual items is large —bolts, nuts, screws and the like—use small cartons with joints and flaps secured with gummed Kraft tape and dipped in stock No. 7300-984000 sealing wax.

WHAT'S WRONG with the picture on page 52

1. That air-conditioned wooden crate won't give much protection to the turbo-supercharger on its mission to the repair depot. Vital items such as this need the strong escort cover of standard turbo-supercharger containers or suitable substitutes. Always use a substantial wood case that protects equipment from rust and corrosion as well as shocks encountered enroute.

2. The regulation box on the left, being subjected to a heavy crowbar attack, is the one the boys should be using. It is sturdily built and put together with bolts which must be removed with a wrench before it can be opened. That direct assault operation will only result in kindling wood and a disability discharge for the packing case at a time when it is needed most.

3. The man on the platform—unless a runner from the engineering office stops him in time—is about to include a reparable generator along with the supercharger. Two such unlike pieces of equipment lumped together haphazardly, without regard to relative weight and size, will inevitably add up to a sadly broken candidate for the generator salvage heap. Be sure to pack generators in metal containers or in a well-reinforced package to insure safe transit.

4. What is that mournful object huddled inside the crate, apparently awaiting its rendezvous with the rest of the formation? No doubt your 20-20 vision has already told you that it is a piece of damaged wing-tip which cannot be repaired. The supply officer at its destination will hit the ceiling when he sees it because he expects shippers to check master reparable lists before wasting valuable space with cowling wing sections and other odds and ends that will not be patched up anyway.

5. The supercharger won't have a fighting chance for survival if it's not bundled in its waterproof envelope. The bit of torn paper shown will do mighty little to prevent corrosion and damage, in which case the assembly will not be fit for repair when received.

The Intercom

AIR FORCE presents these answers to its Question of the Month. Replies are those of personnel recently returned from combat duty.

QUESTION: Which member of the ground echelon at your station gave you the most help in completing your tour of duty?

1st Lt. Jack B. Moore, pilot, England: "Mechanics and the squadron engineering officer helped me most. Once the mechanics were trying to set a theater mark for no turn-backs with our plane. Unfortunately it burned out an engine on the 68th mission and I had to come back. I really sweated out my crew chief. I dreaded to face him much more than I did the abortives board. In fact, I worried more about the chief than the possibility of running into fighter opposition. All the way in I was hoping it had been a genuine engine failure. It was, and everything was OK with our mechanics."

S/Sgt. Henri Wohnsen, gunner, England: "There were a great many things that helped me get through my missions, and they are the things which would still please me if I am sent back to England. They kept up my morale. First, I like the countryside over there, covered with more flowers than you can imagine, and for another thing I would never get tired of wandering around London. English girls are about the friendliest people I ever met. They don't act as if they own the whole damn world, and I admire that. Then, they have plenty of dances. You should see some of those girls jitterbug."

T/Sgt. George T. Barrett, radio operator, Italy: "The GI bartender at my station did his part toward getting me through my missions in good shape. He was jolly, had a red face, a round belly and talked in that easy, friendly way of an American bartender. It wasn't so much what he served, as the way he served it. He got to know every fellow who came into his place and he would whip up a favorite drink without being asked for it. That made it seem like a neighborhood bar at home. We all liked this guy. We called him Red. He's still over there with his apron on, keeping the boys happy."

1st Lt. Eric A. Johnson, pilot, Corsica: "Our flight surgeon helped me complete my tour of duty, as he did many other crew members. He kept close watch over us and knew just when to send us on a rest cure. In fact, he knew so much about pilots that he could study a flyer for a few moments and then tell him almost exactly how many missions he had flown. He could also tell how many rough ones there had been. In a quiet, informal way our flight surgeon was studying us all the time. He got the most out of us in order to satisfy the big shots and at the same time he didn't drive a man too far."

S/Sgt. Douglas L. Leith, engineer-gunner, Corsica: "It all comes from the mechanics wanting you to come back. They not only kept our plane in perfect condition, but they were there to wish us good luck, and greet us when we came back from every mission. You get closer to those guys than the ones you fly with. They are the ones who got me through my tour of duty and I give them the credit. You've got to see a crew when their plane is late to know actually how mechanics feel about the airplane in their care. My plane had only minor mechanical trouble during my entire tour of duty."

S/Sgt. John Griffin, gunner, Italy: "In my case it was a personal friend from my home town, a corporal a few years older than I am. He was the kind of a fellow who could understand other people, and occasionally he would notice that I was getting bitter. Without saying very much about it he would get me into a bull session and we would talk about the people we both knew back in Reading, Mass. He could get my mind off things which were bothering me and first thing I knew my spirits were up. Next day I'd be back in the turret doing my job and feeling better than I had for a month."

Rendezvous

(Continued from Page 3)

good charts when things go smoothly, but let the pilot make two or three turns to avoid a cloud or another formation, and they are lost. A pilot making a 360° to let another group catch up, will almost always bring from the navigator a wail of 'Where am I?' In regards to that, the pilot should always tell the navigator when he is going to do anything not planned.

A good navigator will:

1. Call the pilot one minute before a turn and tell him which direction the turn will be and how many degrees he must turn. This is immensely helpful to element and squadron leaders. They can 'play' their turns with the group and not overrun or lag. 2. He will get a good wind on initial climb and not get to the assembly point two minutes late or ten miles off course.

That's about it. Of course, we are flying a B-24 in the ETO and conditions may be very different elsewhere.

Lt. John W. Eggleston & crew,
APO 558, NYC.

Pretty Good, Huh?

Dear Editor:

In your November issue you asked for a safety record to top those you had printed. Here it is.

The First Air Transport Squadron (mobile) has operated over the "Hump" and over hostile territory in China for more than 11 months with only one accident. During this time the crews have amassed more than 40,000 flying hours. All of the original aircraft, with the exception of one which crashed and another which was hit by enemy bombs, are still on full scale operations.

Pretty good, huh? Incidentally the type plane used is the C-46A, considered by so many to be a "bad ship."

Lt. Rus Walton, APO 493

Show Off

Dear Editor:

. . .I'd like to tell you how I was cured of a childish and dangerous practice.

Last summer, shortly after returning from overseas, I was sent to a base in the South to take an instrument course. Our entire class was composed of combat returnees and, with the exception of a dozen or so, we had all been together either overseas or in the States. Furthermore, our specialty had been heavy bombardment. Thus, I took it for granted that the few pilots whom I hadn't known before were also . . . heavy bomber pilots.

The type of aircraft flown during the course of instruction was an AT-6. The flying period consisted of one ride with the instructor and two buddy rides. Most of us were elated over flying single-engine again as some time had passed since any of us had enjoyed the sport of a light, easily maneuverable plane. The planes were restricted as far as genuine acrobatics were concerned due to the sensitive radio equipment which all of them carried. Nevertheless, while on a buddy ride if you were in the rear cockpit

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THE AAF LOOKS AHEAD

(Continued from Page 14)

try, electronics, the sciences basic to rockets, jet propulsion, radar, and revolutionary developments as yet unconceived.

✗ It must also be fully understood that scientific research and development will not of themselves keep the United States in the lead. Scientific and tactical advances must go forward hand in hand and be reflected in the aircraft, armament, equipment and weapons actually being used by our air forces. All of our present aircraft, our powerplants, and many items of essential equipment are in a sense "obsolete"—in that they are or may shortly be surpassed in utility or performance by other equipment, in the blueprint or mock-up stage, but not yet in production. Unless our air forces can continually improve the equipment in use—we will find ourselves subject to attack by others with no answer except to "take it on the chin" until we have created modern equipment through overtime methods. That is a very expensive practice.

The American people must never again assume—as after the last war and as the French did up to the break-through in 1940—that numbers of aircraft and quantities of equipment make an air force. A second-rate air force is worse than none because it gives rise to a false sense of security—which bombs may quickly demolish.

✗ Even an up-to-date air force in being may not constitute airpower. Preeminence in the air implies maximum ability to maintain and expand existing establishments. There must be a strong and healthy aviation industry, building thoroughly modern aircraft and equipment, and developing, testing, and experimenting with advanced designs for tomorrow. Segments of industry must be capable of and ready for rapid conversion to quantity production and certain Government-owned plants and production equipment not subject to rapid obsolescence should be kept in standby as a war reserve against the potential aggressor.

The importance of a progressive aviation industry cannot be over-stated. One way to keep it progressive after final victory is promptly to sell, salvage, or scrap excess or obsolete planes so that they will not hang over the Air Force and the aviation industry retarding development. This happened after the last war, but must not happen again. The AAF is already taking steps to meet this situation by declaring planes and equipment surplus as they are currently worn out or no longer useful, and turning them over to the Surplus Property Board for appropriate disposal.

✗ Airpower must be employed from large, fully-equipped, strategically located bases. Our air forces must be able to meet and overpower the aggressor's air threat as near as possible to its source. It is obvious that air operations are already global. Our air forces have learned in the stress of war to operate in all climates and under all conditions. These lessons must not be forgotten. Air power in the future will depend on the possession by our air forces of the knowledge and experience required for immediate and continuing *world-wide* operation.

✗ In all-out war the Army tactical air force and the Navy air force teams must work closely together with our Army and our Navy. Each must understand the techniques, tactics, capabilities, and limitations of the other. This can only be secured by actual service together in tactical exercises and maneuvers during times of peace.

✗ We have learned and must not forget that from now on air transport is an essential of airpower, in fact, of all national power. The undreamed of development of our fast air transport and the way in which it was used has been set forth in this report and in the report which preceded it. We must have an air transport organization in being, capable of tremendous expansion.

Another lesson taught in this war is that a healthy, self-sustaining commercial air transport industry is vital to the realization of effective airpower. The contribution to the military of our competitive civil carriers in equipment, trained personnel, operating methods and knowledge have been of first importance in this war. The AAF and the nation as a whole have a very real interest in the preeminence of our civil air transport structure.

✗ Troop carrier operations are present-day actualities, as we have seen in Crete, New Guinea, Italy, Normandy, Southern France, Holland and Burma. The American people must visualize that the aggressor's blow may be attended by dropping of large bodies of troops to seize our vital centers. Similarly, to assure our security, we must be prepared to counter this employment of the airplane and to employ it more effectively ourselves.

✗ None of these essentials of airpower will be effective without adequate trained and experienced personnel. In this war, with a very small nucleus, we were forced to start from the bottom with raw material. The AAF Training Command has done a tremendous job in turning out large numbers of navigators, bombardiers, pilots, aerial gunners, glider pilots, liaison pilots, WASPs, and others. It has trained thousands of technicians and specialists essential to airpower. All this took time, but we cannot always count on having time.

There must be in continuous operation an up-to-date training establishment fully supplied with the latest aircraft and equipment. The AAF and the nation must encourage private flying. We must make available to educational institutions aircraft and equipment that can be spared to help familiarize American young men and women with the fundamentals of aviation, for it is obviously upon youth that the nation must rely for its protection against attacks of aggressors. ☆

GLIDERS

(Continued from Page 12)

worn on service ribbons, denoting participation in assault landings on hostile shores.

Certainly those who volunteer for glider training will collect plenty of anecdotes to tell their grandchildren. For instance, the stories that came out of the glider-borne invasion of Burma are straight Hollywood. Consider the drama of the situation a few minutes before take-off, with the tugs ready to warm up, when a photo recon came in with word that one of the two fields they had been briefed to land on had been obstructed by the Japs. In 10 minutes, 53 glider pilots had to be rebriefed so that all landed on the same field.

They took off, heavily overloaded. Some gliders carried 16 fully equipped men with payloads totalling 4,500 pounds—average CG-4A load is 3,750 pounds—and headed up over 8,000-foot mountains. Because of the overload and the continuous climb there were 16 premature releases of which 9 landed behind enemy lines.

Most of them got out OK, thanks to the varied and intensive training they'd received at Maxton. A party of 14, commanded by a British lieutenant colonel named R. P. Fleming, spent a week wandering around enemy territory. In one case they pussyfooted through a field right behind a line of Jap sentries—all of whom were staring intently in the opposite direction. With the help of such tricks of Cowboy-and-Indian days as walking backwards into river fords they made their way undiscovered to the Chindwin—and had to swim it with enemy patrols within spitting distance. When it was all over Colonel Fleming had this to say of the American glider pilot in the party: "To F/O Bruce Williams' skill in landing his glider the party owed their lives. Thereafter he showed both equanimity and enterprise in a high degree."

According to the book, glider pilots on the ground are under the command of the local airborne commander until they can be evacuated to their own base. In actual practice GPs have been moved out with amazing speed—some who took part in the Normandy invasion were back in England a few hours after they'd touched down in France.

However, sometimes they've had to stay and fight for long periods of time. In Burma, for instance, Capt. Vincent J. Rose and 2nd Lt. James S. Bartlett landed their gliders as part of a formation supplying British troops at a place called White City. Almost immediately L-4s and L-5s began evacuating GPs from a strip and all but Rose and Bartlett had been taken out when enemy mortar fire bracketed the area.

They stayed for eight days with a force of 1,800 British troops fighting off an estimated 6,500 Japs. Bartlett operated the landing strip where L-4s and L-5s came in to evacuate wounded whenever enemy fire slackened. Rosé, an ex-artilleryman, worked at the artillery OP and both made themselves generally useful. They were part of a great Allied victory and both are proud of their contributions to it.

There seems to be no doubt that the glider boys lead exciting lives during an operation, but some people question the time in between. Lately, as a consequence of the directive that made twin-engine ratings obligatory for new glider pilots, it has been decided that GPs will be given every opportunity to get copilot and pilot time in C-47s. In other words they will be encouraged to keep and develop their power plane skill along with their motorless technique.

What it all adds up to is that the AAF has a new elite—Troop Carrier's triple threat men who are among the most highly trained specialists in any army anywhere. They've already done a terrific job and if they kind of stick out their chests, you can understand it. A wise man won't ask glider pilots—as did a ground officer in an English pub just after the Holland invasion—"What's the 'G' in your wings for?"

The answer came loud and clear: "Friend, you can tell the world for us—the 'G' stands for guts!" ☆

In the Burma campaign many AAF glider pilots found themselves engaged in continuing ground combat, working with British or American forces through some rugged moments.

Tac R

(Continued from Page 13)

He comes across, joins the squadron—and you tell him not to fight. He can't see it right away." Maj. Robert T. Simpson, operations officer from Montgomery, Ala., says much of the time Tac R teams are given routine assignments to cover a specific area. A pilot will be given time over target, say a couple of hours, and the ground liaison officer may say, "Army is worried about this crossroads and these two highways, and you'd better pay special attention to them. Look for any southbound traffic in the area." The pilot and his teammate will work over their area, and every few minutes or so will take a run over the crossroads. Anything of immediate importance is radioed to ground control, which will inform the people concerned. The Tac R men check movements on all primary and secondary roads, look for troop concentrations and watch over rail lines, marshalling yards, heavy gun and flak positions.

The flak maps, which enable our bombers and bomb-carrying fighters to pick the least dangerous paths to their targets, are made up largely from reports from Tac R. Finding out just where flak positions are located is not pleasant work.

When a pilot and wingman return from a mission, their interrogation is much more arduous than that given other flyers. They must give complete details of their flight, tell just what they saw and at what time, and at what place. They will make from sixty to seventy—and good recce pilots more—written observations while on a mission, in addition to visual reconnaissance. The Tac R lads photograph, using both vertical and oblique cameras in their planes. A ground commander may need some new photographs of German positions, and Tac R will go in low and fast and take them. Bomber command may need a quick bomb damage assessment job, and Tac R will be over the target the moment the smoke clears away. Their photo work is not of the precise area-mapping sort of photo-recce squadrons, which is done from around 20,000 feet. Tac R's pictures are taken from much lower altitude.

The artillery adjustment now being done by pilots in P-51s, probably as fast as any conventional craft, amazes both ground and air commanders. Most adjustment by plane is done by fellows in L-5s, but the cubs cannot go deep into enemy lines to watch the effect of big guns which fire fifteen miles or so. Adjustment is necessary for truly effective shelling, and the Tac R fellows have worked out methods of doing it.

Before a pilot goes on an artillery adjustment mission, he spends some time with a ground liaison officer, who tells him where the target is, what type ammunition and what size guns the artillery intends using. The recce team finds the target, gets in touch with the artillery, gives coordinates and calls for fire. The shell may take half to three quarters of a minute to reach its target, and because the airplane travels some three hundred miles an hour, the pilot must be some distance away from the target when he gives the order. He then must

get over the target at about the same time as the shell. He spots where the projectile struck, relays information to the artillery fire direction post, and does this enough times to give the artillery a "bracket"—so many shells right and left, so many front and back—which results in the guns being laid right on the objective. Often while doing this a recce team will spot new targets. First Lt. Donald R. Lynch, for instance, is credited with the destruction of a railroad gun at Metz, which he discovered, pinpointed and bracketed for our own heavy guns.

Among the squadrons of the 10th Group is a tactical reconnaissance squadron which claims a record of having planes up, except for the time spent in moving to and from France in the last war, every flying day since January 22, 1917. Its first combat mission was flown by its commanding officer, a major named Lewis H. Brereton. The unit, then called the 12th Aero Squadron, was in France sixteen months and won battle honors in seven engagements. In 1920 it was designated the 12th Observation Squadron and five years ago it formed the cadre for the 73rd Group, later the 10th, and went to England in August, 1942. It moved to bases in France on July 3.

Present commander of the 10th Group is Lt. Col. Russell A. Berg of Chicago, a big, normally quiet fellow, who is quite articulate on Tac R. He says that it takes months to develop a good recce pilot, to train him to see what goes on, to interpret it and to remember. A good number one man is hard to find, and Colonel Berg sees that a fellow is promoted as soon as he has flown five missions in that position. A lot of fellows moved from number two to number one are shifted right back again when interrogation shows that they have not seen as much as they should have.

"They're up there, by God, to find out what goes on," says Berg. "Not to come back and ask questions." ☆

Answers to Quiz on Page 46

1. (C) Bangkok
2. (D) Jet propelled fighter
3. (C) Maj. Gen. Curtis E. LeMay
4. (A) Burma
5. (C) Personnel Services Division
6. (A) True
7. (D) The main jet is idle
8. (A) Single-engine three-place torpedo bomber
9. (B) 700 miles
10. (A) 11
11. (B) False
12. (B) Oct. 20, 1944
13. (B) At the tip of Manchuria, between the Sea of Japan and the Yellow Sea
14. (B) False
15. (A) True
16. (A) Fairbanks, Alaska
17. (B) False
18. (B) P-39
19. (A) True
20. C-97

THEY'VE GOT YOU COVERED

(*Continued from Page 28*)

strument letdowns, Oceanic Air Traffic Control at Hawaii directs the B-24 through the overcast to control tower area. When traffic is heavy the stack-up method of instrument letdown is employed. By this system, the arriving aircraft is cleared to a holding level at the top of the stack, while other aircraft are placed in correct landing sequence at set altitude levels below. As the plane holding the lower level is cleared to the tower for landing, each aircraft above it moves down to the next level. A new radio aid, an instrument landing approach system which is now in process of installation where needed throughout the system, simplifies and accelerates blind landing approaches to the runway and contact landing position (see "Shooting Landings by Radio," AIR FORCE, October, 1944).

As the B-24's wheels touch the runway at Hawaii, the tower notes the landing time and passes it along to ATC flight control. A flight completion report is flashed to Hamilton Field, where another uneventful Pacific hop is posted on the operations board.

This same procedure is repeated as the pilot and crew of the B-24 fly from one Pacific island to another.

This description seems simple and routine. Such is the case when everything goes well, when the weather is fair and clear. But when trouble develops, when weather goes on a rampage, radio circuits record drama in the sky. Logs of AACS stations contain scores of such instances.

An operator's cool thinking and his appreciation of his radio equipment saved a B-24 and its crew lost in bad weather over the Aleutians. All but one transmitter was inoperative and no receivers were working. The radio operator set up a continuous sending schedule after reporting his aircraft's identification and radio trouble. AACS D/F (direction finder) stations set to work tracking the course of the aircraft. Bearings were sent continuously to a rescue B-24 dispatched to intercept the lost bomber. A rendezvous 200 miles north of the airbase was effected, and the bomber was led back to safety. Five minutes of gas remained in the tanks upon landing.

Control tower operators at a Caribbean airbase—T/Sgt. Richard Nussbaum, Sgt. Frank W. Pulvino and Cpl. James A. Outlaw—were instrumental in guiding all but one of approximately 50 air transports and bombers to safe landings despite near zero visibility and a violent storm enveloping the base. One plane, not contacted by radio, was lost.

Cpl. Walter J. Kelly, Jr., assisted in landing an AT-6 at night by giving orientation directions to the pilot who was temporarily blinded by a searchlight beam.

In another instance, S/Sgt. William G. Phillips enlisted the aid of antiaircraft searchlight units which used their beams to point the way to an airport for a P-47 pilot.

Although it represents one of the more exciting phases of AACS work, assisting aircraft in trouble rates second in AACS objectives. Providing the service and the means to prevent aircraft being lost, to warn of danger ahead and to expedite the movement of aircraft on military missions represent the major job.

If all these services fail, then emergency assistance is in order.

To do this communications job, the AACS radio team went to Leyte. For the same reason, T/Sgt. Charles Burke and Sgt. Victor Lundy set up their foxhole tower at Myitkyina, Burma, along a rain drenched airstrip that was no man's land. And Capt. Frank Statum and his detachment of 30 men manning a mobile radio station went along with the fast-moving 3rd Army in France to provide radio aid for troop carrier aircraft bringing up maps, ammunition, gasoline and food.

The system which spans such cities and towns as Brisbane, Adak, Natal, Calcutta, Kunming, Naples, London, Paris, Goose Bay and Dayton, handled during August, 1944, over 6,000,000 word groups of weather and operational traffic daily via its point-to-point system. For the month, tower operators logged more than 4,500,000 aircraft contacts.

AACS personnel are classed as noncombatants but they frequently sweat it out within reach of the enemy's bullets. By their work, more planes, more supplies and more men get to the front swiftly and safely via the airways. ☆

Rugged is the word for this AACS control tower at the Tingkawk-Sakan airstrip in Burma.

SNOOPERS

(Continued from Page 20)

after that big naval battle in Leyte Gulf. We'd searched and searched all night long without spotting so much as a canoe. We stayed up there as long as we could, until our engineer said we'd better hit for home unless someone knew of a filling station in the middle of the Sulu Sea."

"And he wasn't kidding, either," said Binford. "I asked Lockwood to give me a heading home. That was off the coast of Palawan."

"Around dawn," added Lockwood. "And that was about when we first picked up the Japs on instruments, just about the same time one of the crew spotted them visually. There was a destroyer and two cruisers. We all had the same thought, 'What a snap for a Snooper . . . duck soup'."

"We didn't have any bombs, remember," broke in Binford. "But that didn't bother us; we were big operators. We'd go in at our usual 1,500 feet, take some photographs and scare the hell out of the Nips and make them change their course."

"Only 1,500 feet wasn't low enough for us," said Lockwood. "No, we wanted real close-up pictures, so we came down to about 700 feet."

"That's right," said Binford with a grin. "And then we had those Jap ships just where they wanted us. . . . Sure they let us have it, like a 4th of July out of hell. We got out of there quick. I guess the laugh was on us that time."

"Might as well tell the whole story," said Lockwood.

"OK . . . Well, we were on our way back home, tail between legs, when we spotted a lone Jap destroyer. A chance for us to save face by scaring the living daylights out of him. That's what we thought. Before we could even turn into him, do you know what the son ——— did? He chased us right out of there."

"That's what you call adding insult to injury," commented Lockwood, adding wistfully, "but if we'd only had a couple of 1,000-pounders . . ."

To celebrate Pearl Harbor day, the Snoopers inaugurated their lone wolf dawn patrols. Capt. Robert D. Wallace, Limerick, Maine, piloted his B-24 through the night to Lutong oil refinery, the next most important to Balikpapan in Borneo. He came in at dawn and made his run on the cracking plant at 100 feet, almost as if coming in for a landing. Then he came back, spotted some storage tanks and strafed them, got eight. Captain Wallace headed for home and sent a brief flash to the commanding general of Bomber Command. "Have some cold beer ready for our return to base." The general had beer ready, a whole case packed in ice.

On the other side of Borneo, there was a dock area at Labuan Town. The tense is correct, for Lieutenant Binford's crew came in, also at dawn, undetected, and made their run at 300 feet, placing a string of gasoline incendiaries the length of the waterfront, with every bomb in the target area. His flash report: "The daylight boys can scratch the target off their schedule. Labuan dock area doesn't exist any more."

Bomber Command admitted that the demolishing job done by these two lone Snoopers could have been approached only by large formations of daylight heavy bombing from high altitude.

The epitome of Snooper individualism, their zeal to do any job on their own, unassisted, is the case of the B-24 piloted by Lt. Jack L. Wagner, of Ventura, Calif.

This Snooper was shot down after a night attack on Truk. All but two of the crew got safely into a life raft after a water landing. The navigator got his position; they headed for their home base, then in the Admiralties, some 650 miles away. As they paddled and sailed, several Jap Bettys flew overhead, but the crew managed to camouflage itself by holding up the blue side of a tarpaulin. They were evidently well camouflaged anyway, for almost daily friendly daylight heavies on the Truk run passed overhead without sighting them. The were doing all right on the 19th day when a Navy Cat spotted them.

The Cat swooped down low and gave them the once over. Their thin, worn faces and short cropped hair must have given them that hungry Nip look, for an observer on the Cat's wing called to his pilot that they were Japs. A side gun was swung toward them, but couldn't quite make it. Meanwhile, Lieutenant Wagner was jumping frantically up and down, shaking his fist and shouting, "If you shoot, damn your eyes, I'll kill you!"

That convinced the Cat, and the rescue was made. When the Navy pilot asked about their experiences, Lieutenant Wagner's only comment was, "If we'd just been left alone down there another six days we'd have made the Admiralties by ourselves."

The Snoopers have quite a few tall stories in their repertoire, including the time they spotted what looked like a ship on the detector and made a bomb run on a waterspout; or the time their plane "jumped" over a mountain in New Ireland.

Tall but true are the stories of their first long over-water missions to Palau and Truk as guinea pigs to see if it could be done. The Snoopers made it, and only then did the daylight boys take over. When enemy fighter opposition took a heavy toll of our heavies on the first Balikpapan raid, Bomber Command decided something should be done about it. That something was for a Snooper, acting as bait, to go within range of Jap detecting devices an hour before the attack to jam them and to draw up enemy fighters.

No, it's no snap to be a Snooper—but if you ask one of them he wouldn't be anything else. ☆

Answers to "How Sharp Are You?"

On Page 2

1. P-38
2. Three
3. Two
4. On his head
5. On belt of man at left
6. Man at right
7. Yes
8. Two
9. Man at left
10. Stand at left

Rendezvous

(Continued from Page 57)

and came out from under the hood for a breather, the lovely fellow in front would shake the stick and say, "Let me have it."

Then he'd let you have it. For the remainder of the period, you'd be subjected to the most stupid, sickening and backwrenching turns and twists imaginable. All this time while you were in the throes of despair, Walnut Head at the controls was under the impression that not only you were enjoying the flight but admiring his ability. By the time you had landed, you not only disliked this fellow but were ill on top of it all. The most astounding thing about the whole setup was that when you were in the front seat you did identically the same thing as your comrade. The urge to "show off" was just too great.

Until the particular incident which I am about to describe, I had been riding only with my acquaintances. On arriving at the flight shack I noticed offhandedly that I was scheduled to fly with a student with whom I had not flown and did not know.

We sauntered out to the ship, and I climbed into the front and he into the back cockpit as per schedule. We took off without incident and, after climbing to a prescribed altitude, my new friend went under the hood and very diligently began to apply his energies to instrument flying. I kept looking at the controls, wondering how surprised the heavy bomber pilot in the back cockpit would be if I were suddenly to wrench the stick back and go into a vertical stall. Oh well, he'd come out from under the hood shortly and then . . .

Shortly thereafter, on glancing into the rear-view mirror, I noticed that the truck driver had peeled back the hood and was looking unconcerned. Now was the time.

I shook the stick gently and said in a bored voice, "Let me have it, old man."

He answered quickly and just as informally, "Sure. It's all yours."

The next second I was in a vertical and pointed toward the base of a fluffy cumulus. Now I pulled up, climbed almost until stalling speed and then fell off on a wing. Very neat. Then for a few vertical turns, a couple of nice wingovers and I knew I had sold him. I looked into the mirror again. He must have been really admiring me. I had never been in finer fettle. For the next few minutes I really gave him my all. Then having exhausted my aerial repertoire and knowing that he was mine, I leveled out.

Then, I heard the click of the mike button very distinctly, and the voice of the back seat driver said very clearly, "Let me have it for a minute, old man."

I then prepared to settle myself comfortably for some dull and level flying.

KERRASH!! My head hit the canopy

and my feet wouldn't go back on the floor. The safety belt was razoring me, and I was trying to grab something with my hands to hang onto but they wouldn't come down below my shoulders. I was being stretched. My ribs were pulling apart. My feet were even with the instrument panel. My knees brushed my ears. The very next instant I was a midget. My shoes were welded to the floor and I thought I was going to have permanent ruptures. My jaw slid down over my chest, and I could look straight out at the top of the stick. At times I couldn't see anything but I don't whether I blacked out or my eyelids just wouldn't come back into place. Verticals, snaps, dives, ups, downs, overs, unders, and, as for describing the other things which occurred, I'm at a complete loss.

Eons later I very faintly heard the mike button click and a voice ask: "Wantta take her in?"

Not being able to find the phone because my vision was obscured by great spots and wavering blobs, I merely nodded my head. I knew he had released the controls but, to allow the ship to descend, I carefully eased back the throttle and gravity did the rest. My hands and feet were shaking so violently from the ordeal that I knew if I handled the controls the ship would start quivering and my passenger would know something was amiss.

How this aircraft ever found the pattern and subsequently landed by itself will forever remain a mystery to me. I had the canopy wide open and was gulping in great lungfuls of wonderful air trying to calm certain internal disturbances.

After having taxied slowly to the line and crawled out on the wing, I stood for a moment waiting for the canopy to slide forward on the back cockpit. Eventually it did, and there was my boy just as calm and cool as a cucumber. I mustered my remaining strength and, leaning forward so he could hear my barely audible whisper, I asked, "What'd you fly, heavies?"

His answer came back snappily, tersely, "No, P-40s, Guadalcanal, 18 months."

I slid off the wing and went weaving off to the nearest latrine.

I don't show off any more.

Capt. Charles M. Davis,
Hq., 2nd Air Force

PICTURE CREDITS

Front cover, T/Sgt. Roger Coster. 10: Signal Corps. 46-47: Boeing. All other photographs in this issue furnished through official Army Air Forces sources. Requests for prints of photographs appearing in AIR FORCE should be directed to the AAF Photographic Library, Headquarters, AAF, Washington 25, D. C.

Shell Game

Stalking the Jap fleet in its lair was the job handed to these six Liberators. Three got back

When the war ends and pilots can sit around swapping yarns about how rough it was over this or that target, Lt. George J. McDowall need fear no man. He has his story. It's the story of his third mission.

McDowall flies a Liberator in the 13th Air Force. A few weeks ago, a formation of six bombers was sent to attack ships of the Japanese Navy in Brunei Bay, Borneo, and McDowall was in the No. 6 spot.

Ten miles from the target a Jap battleship of the Kongo class began shelling the formation with its heavy guns. Huge sheets of flame enveloped the ship each time it fired a salvo. Then, from all the big ships in the harbor, came the barrage—silvery incendiaries, rocket missiles, purple, orange, red, yellow and blue puffs of antiaircraft, and bursting phosphorous shells.

The formation staggered on to the target. No. 1 was hit and went down in flames. No. 2 had to feather an engine. No. 3 began to smoke and went in after making its attack. No. 5 blew up in the air. No survivors were seen.

Suddenly McDowall's plane rocked and bucked from the impact of a thundering six-inch shell from the battleship below. The plane was tunneled from bomb bay to tailpiece. Entering at the front bomb bay, the shell ripped out guns, exploded oxygen bottles, tore out interphone wires and gashed the horizontal stabilizer. Luckily the shell was equipped with a time fuze and it did not explode.

While the plane was still on the bomb run, and with a strong wind whistling through the hole made by the direct shell hit, a Zero came nosing around from six o'clock low. A job for the tunnel guns. Sgt. William R. Bogart, who fortunately had been in the waist when the shell struck, hurried to his guns only to grab the shattered remainder of the azimuth ring which once held them.

On its way through the Liberator, the shell had set off a box of .50 caliber ammunition. These bullets became an added hazard. Sgt. Richard W. Finch, right waist gunner, was hit but he still manned his guns with a .50 caliber fragment sticking in his neck.

Phosphorous shell explosions directly ahead of the plane had nearly blinded the bombardier, Lt. Frank E. Turner, but his bombs, along with those from the remainder of the formation, bracketed a cruiser, scoring direct hits amidships and leaving it smoking and sinking. Lt. Robert L. Stewart, the navigator, stood between the pilot and copilot during the attack doing all the praying for all the crew and earned himself the crew's subsequent designation of Deacon, First Class.

As the bomber flew through the fierce and colorful barrage, Lt. Seldon C. Vaughn, the copilot, became so fascinated and preoccupied with the showy Jap fireworks that he accidentally let the rpm run up too high and had to spend the time over the target adjusting the propellers so they would synchronize again.

One of the lesser items of damage in the plane was the puncturing of the crew's only can of tomato juice and, as they munched a dry lunch en route home, this made them madder than anything else.

McDowall, afraid the great holes in his B-24 might cause it to buckle when it hit the runway, ordered the entire crew forward for the landing at the base. But there was no need to worry. The Liberator rolled to a perfect stop.

S/Sgt. Martin Boyajian was waiting at the field. For months he had sweated over that Lib and after taking one look at the damage by Jap shells, he shrugged with a true crew chief's resignation and said, "Well, it was a good ship once, anyhow."

McDowall apologized. ☆

This B-24 blew its top when flak burst in waist section during mission over Yugoslavia. The shell blew out both guns, severed the rudder control cables, killed one gunner. Pilot guided the Lib home using only the engines.

More

Marauder at left gets pasted in belly by flak burst that killed bombardier, seriously injured a gunner. Despite severe flak damage the B-26 succeeded in dropping bombs on target and returned to base.

GI ingenuity saves the day for a B-24 whose hydraulic system was shot out over Germany. Parachutes released through the waist windows of the brakeless Liberator, just before the wheels touched, effectively slowed it down.

Riddled with flak holes sustained on a mission over Debreczen, Hungary, this B-17 almost split in two when its tail wheel gave way during landing. No one was hurt. Test flights show B-17s have enough extra strength to carry bombs under each wing and this bonus helps when bomber is crippled.

The next time you are sweating out a mission home, rubbing your rabbit's foot and nervously eyeing a flak-chewed engine, remember that in addition to the mystical powers of the rabbit, you also have the talents of the AAF design engineer on your side. Basic precept of design and construction of AAF planes is that they shall be rugged, rugged enough to keep flying after an engine is shot out, a wing tip blown off, a stabilizer shattered, a wing or fuselage burned through.

What's more, considerable extra strength is built into the airplane to help it weather the wear and tear of combat maneuvers, the buffeting of gusty air, and the strain of taking evasive action. This extra strength enables the plane, even when badly damaged, to maintain straight and level flight.

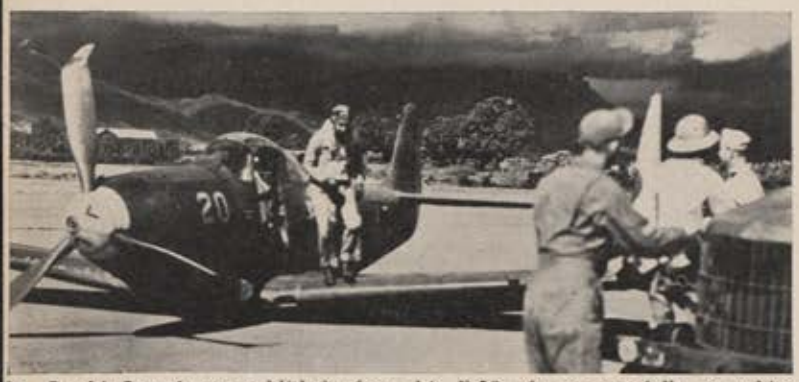
In addition to ruggedness and design safety, all of our bombers are required to have systems of duplicate controls so that one set can be used for flying the plane when the other is shot out. Many planes have had all manual controls knocked out, yet have returned safely on the auto-pilot.

The provision for prop-feathering, to prevent windmilling and severe vibrations that might shake a plane apart, has saved innumerable planes when a shell has hit the powerplant. Fire extinguishing systems that automatically fill nacelles with CO_2 when engines catch fire, also enable many a wounded bomber to return home instead of burning up in the air.

But despite all the planning, it often takes a little something extra to get the old crate home—some slick piloting or a quick patch job or just a happy inspiration from a GI noggin.

This B-17 literally got its tail chewed by Nazi fighter planes using rocket shells. The tail gunner was blown out but parachuted safely. The Fort got back and landed in this condition.

Than Lucky



Lt. David Straub steps blithely from his P-39 after successfully pancaking in from a mission in the South Pacific. Fighter planes are given extra ruggedness for occasions like this when the plane is subjected to severe strain.

Looking like some weird insect whose neck has been broken, this battle-damaged P-51, veteran of 63 missions, was landed by its pilot at an airfield in the Mediterranean theater.

Liberator with wing and engine blazing, gets fast, expert treatment from crash crew at base in England. Five ME-109s jumped the B-24, puncturing tire with 20 mm burst and knocking out the hydraulic system. Tail gunner got one ME, found forty 20 mm holes in his turret after landing.

SHOOTING THE BREEZE

GOT ANY GOOD STORIES? SEND 'EM IN!

Italy. S/Sgt. Norman B. Fishman, a Liberator gunner, found many things which irritated him in the Army. Basic was no bed of roses, gunnery school was worse, and when Fishman began combat flying his irritations became almost unbearable. Yet, he hung on, month after month, and was awarded the Silver Star, the Distinguished Flying Cross, the Air Medal with four clusters, and the Purple Heart. But he was still irritated. The Army was getting under his skin. One day Fishman was examined by flight surgeons, and suddenly he found himself honorably discharged. The order for his release read: "This man cannot wear Army clothing. He is allergic to wool."

England. In the old days when the boys were flying unescorted missions over the sub-pens at St. Nazaire, the Germans used to experiment with colored flak. They tried pink, brown and black in interesting variations. One Fortress group found it advisable to give green navigators a little aging before assigning them to a crew. On one trip, when a new navigator was making his first flight, Jerry threw up a curtain of ack-ack which the navigator mistook for an unusual cloud formation.

"Ah," said the youth over the intercom, happy to make himself useful, "that's fractocumulus. When you see those clouds below nimbostratus, trouble is brewing."

With fine restraint the others kept silent. A few seconds later an accurate burst exploded much too close to the bomber.

"And that," said the pilot nervously, "is flak forming on the wing!"

Romania. When American prisoners of war, mostly airmen, were liberated from Romanian POW camps, the Germans came over and began some intensive bombing. T/Sgt. Thomas J. Murphy, newly released POW, found the bombs dropping uncomfortably close and took refuge in the first building he could reach. He found some stairs leading to a dark basement apparently filled with empty boxes. He crouched down among the boxes, which rattled every time a bomb exploded, and waited for his eyes to grow accustomed to the dark. A few minutes later some of his buddies, who were hiding in a bomb crater in the street, saw Murphy come flying out of his shelter and start running down the street. They hailed him and he landed in the crater with his eyes like saucers.

"What's the matter with you," one of the guys said. "Don't you know enough to stay in a shelter in a raid like this?"

"I prefer the bombs," chattered the harassed sergeant. "That damn place is a storehouse for coffins!"

USA. Classified ad section of *The Rattler*, newspaper of the AAF base at Pyote, Texas, carries this dark announcement: "Whoever swiped my girl's picture out of my foot locker, go ahead and keep it! She hasn't written me for two months anyway. You'll be sorry. Pvt. Herman Gladzack."

Scotland. A fighter pilot stationed in Scotland had a problem so he went into a pub to drink it over. There he found a Gordon Highlander with whom he struck up a fine alcoholic friendship. When they both finally weaved out of the pub, still clutching the glasses that contained their last drink, they found that it was raining. Immediately, and somewhat to his annoyance, the American found himself hustled along at what seemed unnecessary and undignified speed.

"Whoa, whoa!" he cried. "Who minds a little rain. What if we do get wet?"

"Whisht, mon," said the Scottie, "it's no ourselves I'm thinkin' of. I just dinna want all this water dilutin' my drink!"

Burma. A couple of glider pilots, one from Boston and the other from New Haven, who had landed with airborne troops behind the enemy lines, found themselves all alone and defending a road block that cut off the last Japanese line of retreat. A fairly strong enemy patrol had tried twice to break through. The glider pilots had driven them back with a hail of tommy-gun fire, but now ammunition was running low.

The Jap survivors reformed and launched a suicidal "Banzai" charge. The Americans shot them all down except one. This one, an officer, came straight up to the barricade brandishing his sword.

Three feet away, he halted and screamed, "Go to hell, you beasts, and to me at once all surrender. If not shall horribly die all the Yankees!"

One of the glider pilots—the one from New Haven—calmly shot the officer through the head with his last bullet. Then he turned to his companion and commented:

"That'll teach him to go around talking like a Harvard man."

India. A colonel had a general for a boss, which is not uncommon in the Army, and whenever the general asked him a question, he infallibly replied "Yessir," which is not uncommon either. One day when the general was away on a trip, and everybody knew it, the colonel happened to leave his office door open. He was sitting at his desk, happily engaged in checking some list or other with his secretary. The girl was pointing out items on the list and the colonel was giving his concurrence to each item by saying loudly and monotonously "Yes, yes, yes, yes, yes." A corporal in the outer office resisted temptation as long as he could, then yelled loudly, "Keep the general on the phone, colonel; I wanna talk to him!"

So far the corporal has retained his anonymity and consequently his stripes. ☆

THE ALBUM

1910, Manila. Big Chief Keep-Um-Feet-On-Ground got talked into this photo by Pilot L. Hammond who is shown with helmet and medal. The Chief, who got his primary in a BT 57 Ox Cart, will probably fly by the seat of his pants.

1911, Puerto Rico. Lincoln Beachey made a big hit with the bobby sox crowd when he exhibited his Curtiss biplane at the Insular Fair at San Juan. Nobody swooned.

1916, Mexico. Maj. H. A. Dargue, who just landed as part of the Punitive Expedition, holds off the stone-slinging citizenry by posing for photograph for two hours.

1918, France. Hot pilots of the 11th Aero Squadron do a little collective mugging for the photographer. The boys used Jiggs with a bomb under his arm for their insignia and together with five other squadrons, participated in 215 raids.


thanks, Sucker
Is this Nazi talking to you? When you fly over enemy territory, don't carry ANYTHING that reveals your unit. Violation of this security rule plays right into the enemy's hands. It endangers your friends. It may cost their lives!