AIR FORCE

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

MAY 1944

FOR EUROPE...REPEATED MASS ATTACKS

These bombs, descending on rail facilities at Borgo San Lorenzo, Italy, are typical of the thousands of tons of explosives which are falling on Hitler's European industrial and communication centers in repeated mass bombing attacks by the AAF. In tough one-two punches, AAF strategic bombers are striking from the west with the massive 8th Air Force and from the south with the ever-growing 15th. Recent weeks have seen the first all-AAF mass attacks on Berlin, heart of the Nazi empire. In January and February, AAF planes struck Europe with 62,000 tons of bombs—fifteen times the number for the same period in 1943. For a summary and photographic study of recent AAF bombing attacks on Festung Europa, see Pages 6 through 14 in this issue.

CROSS COUNTRY

If you're sweating out some mail in a converted Italian palace, a New Guinea tent or one of the Nissen huts the AAF maintains here and there, you probably have good reason to grouse—but perhaps not at the Army Postal Service.

More than 25,000,000 pieces of mail are being sent overseas each week. And according to a recent War Department statement, fifteen percent of that mail is first incorrectly or insufficiently addressed, a serious, growing problem.

To eliminate unnecessary delay or loss of mail, the War Department is stressing that a complete address must list: (1) rank, (2) full name with middle initial, (3) Army serial number, (4) service organization or unit, (5) APO number and (6) the postmaster at the Port of Embarkation through which the mail is routed.

You know all that, of course, and the War Department is making every effort to tell the folks back at home about it. But you can help by giving them full information in your own letters and reminding them always to use the complete address. If the proper instructions are carried out, then those letters from home should be on hand when the mail shipment arrives.

30,000 Released

When, during March, some 30,000 men of the Ground and Service Forces who had volunteered for, but not yet commenced flying training were released by the Army Air Forces and returned to their original services, the War Department stated several reasons for the action.

The first was a reduced requirement for manpower in the AAF. General Marshall pointed out that the AAF was approaching complete air supremacy in practically every theatre at a much faster pace than the Army had dared to hope, and that the combat losses were considerably less than the anticipated percentage on which development of the AAF had been based.

The second reason was the general shortage of trained personnel throughout the Army. Due to the cumulative shortages which had developed in the Selective Service since last July, it has become necessary to utilize every available soldier to meet current demands for pending operations. Thus, the AAF was really returning the favor of manpower assistance that was extended to it in the earlier days when, faced with the need to create the world's largest air force, thousands of picked men from the Ground and Service Forces were permitted to volunteer for AAF service.

In its statement, the War Department made it clear that the AAF need for picked young men will continue and that this transfer did not imply any intention to stop training or the future acceptance of applications from 17-year-old-men. Temporarily, however, enlistments of 17-year-olds in the Air Corps Enlisted Reserve have been suspended.

General Arnold, in a letter made public at the time of the release, said:

"I take this action with the full knowledge of the disappointment it may bring to some of the men concerned, and to them goes my heartfelt appreciation for their proffered services. Beyond this feeling is one of strong pride in the combat crews now trained, who by their aggressive superiority in the air have permitted me to reduce somewhat my training requirements in terms of men needed.

"I am further gratified that the AAF is able in this critical manpower period to release excellent men, to serve in those branches of the Army for which they have already received training. It is my belief that their presence in combat will shortly be felt by the enemy."

What's Good for the Gander

Women's Airforce Service pilots will be given training similar to that of AAF officers, according to AAF Letter 40-7, dated 27 March 1944. A training course for this purpose has been established at

THE FRONT COVER

With her tour of combat duty at an end, the Blue Streak, B-24 of the 15th Air Force, circles Mt. Vesuvius as a farewell gesture before heading for the States.

. . . bring May flowers.

the AAF Tactical Center, Orlando, Fla., and the first class of fifty students was scheduled to begin April 19. Subsequent classes will enter the first and third Wednesdays of each month until all assigned WASPs have received the prescribed training. Each class will be in training for approximately four weeks.

Quotes from Britain . . .

Maj. Samuel L. Davis of Waben, Mass.: "All I could think of at the time was 'My God, here I am over Berlin—and can't write my wife about it.'"

Public relations man, 8th Air Force: "Their majesties, the King and Queen of England, stopped at this field today, inspected both Fortresses and Liberators, talked with crew members, discussed flying tactics, had tea and went on."

Lieut. Norman Gill of Lombard, Ill., co-pilot of Missouri Mauler: "Today was the 13th and it was my 13th mission. I drew ration kit No. 13 and there was a No. 13 camera aboard. Now there are 13 flak holes in our ship."

Capt. Robert W. Waltz of Akron, Ohio, speaking of Capt. Edwin McMichael of Colonia, N. J.: "Fifteen seconds from the bomb release line, flak ripped into our bombardier's forearm, yet he struggled back to his position in time to release his bombs on the target. What McMichael did is the thing they give medals for."

Staff Sgt. J. J. Verbitsky of Miami, Fla., gunner on Swamp Angel: "Any flyer who doesn't get one of those flak suits and use it is nuts. I had an extra one on today. I had a hunch and put one over my head. A piece of flak bounced off it, knocking me down."

Lieut. Harold T. Barnaby of Waco, Texas: "I turned into them and then dived to 8,000 feet and hid. I circled in broken clouds for five minutes. Then I came out and they were waiting for me. I ducked back in the cloud, I stayed in the clouds for another ten minutes, then came out. They were gone and I headed for home."

To the Letter

Now and then we hear of men in the AAF who are so determined to carry out instructions that they follow orders even when they blow out the window. From Key Field, Meridian, Miss., comes this story of a new member of a P-39 ground crew.

"There are three things I want you to do before a flight," his commanding officer explained. "Put a parachute in the cockpit, help the pilot put the chute on and then have him sign the Between-Flight Inspection Form."

On hearing this simple, however solemn injunction, the young crew member was duly impressed. That afternoon an officer, about to fly this same P-39, approached the plane unnoticed by the ground crew, climbed in and put on the chute. In a flash the new man was on the wing of the plane.

"Lieutenant, will you step out of the plane?" he implored. "Please step out of the plane." Thinking that surely the thing was booby-trapped the pilot leaped out. Whereupon, the new man removed the chute from the cockpit, then replaced it. He asked the pilot to crawl back in and then helped him into the chute. When this business was completed the GI then presented the inspection form for the pilot's signature.

After this confusion it was to the pilot's credit that he flew away in but one direction.

Insurance Salesman

Pleasant thoughts of being in business for himself must have floated through the mind of Staff Sgt. Wolfe W. Rosenstein recently when his total sales of insurance for a day were $1,500,000. Since Rosenstein became insurance clerk of the 654th Technical School Squadron, Sioux Falls (S.D.) Army Air Field, less than a year ago he has sold $50,000,000 worth of policies. For this he was recently selected the field's Soldier of the Week.

Parachute Brakes

Only slightly at variance with crack-pot inventions which have been showering upon aviation for forty years, the crew of a B-24 recently made a landing at a fighter strip at Tarawa by throwing out their parachutes to form enough wind drag to stop the big plane. With their brakes destroyed in a ninety-mile battle with thirty Japanese planes, these 7th Air Force boys cut their landing speed approximately forty miles an hour, and further aided by a dragging ball turret, the B-24 rolled to a stop just as it reached the end of the runway.

Piloted by Lieut. Charles F. Pratte of Warren, R. I., the plane was prepared for the landing by a parachute attached to each of the waist gun mounts and a third one laced to the fuselage bracings in the tail. Just as the wheels touched the hard coral surface of the landing strip the parachutes were released. They billowed out almost simultaneously and the bomber rolled to a stop.

The novel arrival was witnessed by a group waiting for a naval officer who was scheduled to make the first landing on the newly completed fighter strip.

WAR DEPARTMENT
THE CHIEF OF STAFF
WASHINGTON

9 March 1944

Dear Arnold:

On the occasion of the second anniversary of the establishment of the Army Air Forces under the reorganization, I wish to send you my sincere thanks for the vigorous and unfailing support that you have rendered me. I congratulate you on the outstanding job that you have done as Commanding General of the Army Air Forces in these two short years. In this tremendous expansion the entire Army has undergone, your part was by far the largest and most far reaching and I know you are gratified by the results that these efforts are reaping. Your flyers, with their supporting units, are spear-heading the attacks in every theater and their amazing effectiveness is the finest tribute I can imagine to you and the members of your staff.

General H. H. Arnold,
Commanding General,
Army Air Forces.

Faithfully yours,

(signed) G. C. MARSHALL

AAF Ahoy

Air Force men who have felt the call of the sea will welcome the news that the AAF has need of additional men to operate the boats used in its world-wide emergency service, whose mission is to locate and rescue flyers who have been forced down over water.

The surface craft employed in this service range from the 17-foot swamp glider to the 104-foot seagoing rescue boat. The craft are gasoline powered, swift, seaworthy and well equipped for the performance of their mission. Crews vary from three to thirteen men and are commanded by commissioned, warrant or noncommissioned officers, according to the size of the boat.

The emergency rescue service needs experienced personnel to serve as masters, mates, engineers, radiomen, medical tech-

nicians, boatswains, cooks and deckhands. It is desirable that candidates for this service have previous small-boat experience, preferably with high-speed boats. It is essential that candidates be in good physical condition and it is desirable (though not essential) that they be under 36 years of age. Officer applicants must be in the rank of first and second lieutenants.

Accepted applicants will be sent to a training center in one of the southern states for twelve weeks of individual instruction in their specialty such as navigation, seamanship and engineering, and an additional six weeks of unit training to include boat handling, ship drills, rescue techniques, combined operations with aircraft and similar practice. Outstanding accomplishment during this training period may result in promotion and, upon completion of the training, crews will be formed, assigned to ports and sent to duty stations.

Applications should be addressed to the Commanding General, AAF, Attention: Assistant Chief of Air Staff, Personnel, Washington 25, D. C., and must be forwarded through military channels. The following information should be included: Request for transfer to AAF emergency rescue boat activities; name, grade and serial number; age, height, weight and color; education and general classification test score; present assignment and duties; history of applicant's boating and military experience.

Right Pattern, Wrong Field

It happened at San Angelo, Texas, a city which has two airfields located only a few miles apart. First Lieut. Jackson B. Cox said he got the story second-hand, but from a reliable source.

The story goes that the pilot of a transient B-24, deciding to land at Goodfellow Field, called the tower for instructions and was told to come in on the left-hand pattern. Since several other planes over the field were doing it right-handed the B-24 pilot checked the tower again to make sure.

The tower verified "left" so the B-24 broke the pattern and came in as instructed, landed and taxied up in front of Operations. The operations officer came raging out and started giving the pilot hell for coming in the wrong way.

Immediately on the defensive, the pilot called the tower but before he could say anything the tower man demanded, "Where are you?"

"Where do you think I am?" the pilot howled indignantly. "Are you blind? I'm right in front of your damned Operations."

"Brother," came the answer. "If you're sitting on the ground, you're not at Goodfellow Field." The B-24 pilot wasn't, either. He had Goodfellow on the radio but had landed at San Angelo Field.

Mission Accomplished

A WAC lieutenant at an AAF port of embarkation on the Atlantic coast was confronted by a problem which, while not new to her species, presented her with a state of mind that women have enjoyed since the beginning of time. The WAC had a beau in Hawaii and another in Texas and while she might have been happy with either, were t'other dear charmer away, the absence of both young men was a thing hard to bear. As in many cases of this kind, the girl's problem became the problem of everyone around her and much advice was given and many predictions were made. One day the man in Texas seemed to have the upper hand, while a little later it appeared that the gentleman in Hawaii would certainly win.

Recently, however, according to our scout, two lieutenants reported at the port of embarkation for transfer overseas. The WAC processed them both on Monday, and Tuesday she married the one of her choice. Reporting for work on Wednesday the young lady sighed, "Thank goodness my problem is solved." Our only comment, and we're not sure that a comment is required, is that at least all men involved were members of the AAF.

The WARDs of Hawaii

The Women's Air Raid Defense organization in the Hawaiian Islands is made up largely of attractive young women who previously had done volunteer air raid warning work in the United States. Each girl is bound by a one year Civil Service contract and her salary may range from the $140 beginners' pay to $225 a month. Previously, air raid warning work in Hawaii was primarily the responsibility of officers' wives, but since these women usually wanted to leave after their husbands had been transferred, the jobs were put on Civil Service status early in 1943 when recruiting was conducted quietly in San Francisco for a small and select group of girls to work in Hawaii. Recruiting was done through the personnel officer of the Air Defense Wing in San Francisco, and the jobs were offered to unmarried girls between 20 and 35 years of age with at least a high school education. After the initial groups were taken to Hawaii the quota was lowered until now a very small number of girls are taken each month.

The WARDs live in a group of attractive two-story houses, close to their work. For $4 a month a WARD is provided with a bedroom, bathroom and completely equipped kitchen. Groups of them usually live in two-bedroom units. The WARDs provide their own attractive, inexpensive uniforms and pay for their own meals. They have all the privileges of the post and mess at the officers' club, although some prefer to prepare breakfast and an occasional dinner at home. The girls are required to wear their uniforms on the post, but otherwise they may dress to suit themselves. Not one of them has been known to buy a hat, and stockings are seldom worn. To most of the WARDs the job and the climate of

With the WARDs mail time is an adventure, as with all people in the service, and two members (right) appear to be engrossed with intelligence from the States. They wear gold wings after completing three months of satisfactory service. They have free run of the post and enjoy the same rank and consideration as commissioned officers. Many have been quick with the Hawaiian custom of a flower in the hair.

Hawaii bestows a holiday from the expense of new clothes.

When WARDs arrive in Hawaii they are given two weeks' training before they take up the routine of six-hour shifts, which are so arranged that each girl works an equal number of hours during the night and day. They get a 36-hour break every eight days and one day off in every twelve.

Some of the girls were born on the islands; others, though recruited in California, represent a large number of states. Among them are former school teachers, Junior Leaguers, secretaries and college students. Every WARD on duty has passed the Army General Classification Test with a better than an average grade.

Incidentally, the curfew on dates with WARDs is 2200.

Transition

Randolph Field changed cadence on March 18 when it ceased to be the largest basic flying training field in the country and took over a greater and more urgent task of training instructors in every phase of the Army Air Forces program.

When the last cadet marched out of Randolph he took with him the trappings of preparation. The "eager beaver" is gone from Randolph and so is cadet lingo and the short haircut. Gone are the white-gloved hands swinging in march-rhythm, the rigid backs of a thousand "misters" in the cadet mess, the bark of the adjutant "publishing his orders."

Randolph, on that day of transition, became the Central Instructors' School for the nation. The men of the school now wear wings and bars and they are learning how to teach better than any other instructors have ever taught. They are graduate flyers, a little older and a little tougher, and they are coming by hundreds to Randolph. From there they will go to every flying field in the country to impart their new understanding to thousands of other flyers.

Picture Mix-up

Due to an inaccuracy in identification at their source, two photographs were published in the Roll of Honor section of recent issues of AIR FORCE with incorrect captions. In the January issue, a photograph of Capt. Robert Morris Creech was identified as that of Lieut. (now Capt.) Henry D. Chism, who had been awarded the DFC and the Air Medal. Incidentally, Captain Creech also holds the DFC, with two oak leaf clusters, and the Air Medal. In the March issue, a photograph of a Capt. Don A. Johnson was published. It was not the likeness of the Capt. Don A. Johnson referred to in that month's Roll of Honor.

'Know Thyself'

Our flight surgeons are striving toward the ultimate goal of closing a gap between the potentialities of modern airplanes and the limitations of flyers. A cogent statement of their problem is included as a foreword in Physiological Aspects of Flying, listed as Technical Manual No. 1-705. The relationship between men and their planes is explained this way:

"During the last war and until a few years ago it was said that a pilot is only as good as his airplane. This is no longer true. In the race for higher speed and greater altitude, the performance of airplanes has moved relentlessly ahead until now it is the airplane that is vastly superior to the pilot. In fact, it would seem that, like Frankenstein, we have created a monster which, if not handled correctly, can easily destroy us by its actions.

"The inventors, engineers and manufacturers of the new airplanes are doing the jobs demanded of them; building airplanes capable of greater range, greater altitude and greater speed, and making them large enough to carry enormous loads. Now it is the job of the flight surgeons, the scientists and the doctors to close the gap between the potentialities of the airplane and the limitations of the flyer. That they have been doing so cannot be disputed.

"It all started with a small squeak in your door, sir."

—JIM RAWLS & PFC. R. R. RIEKER

—FRITZ WILKINSON

"The flight surgeons cannot find the answer to a problem until they know what the problem is. After a new type airplane is developed, scientific problems arise. These problems are met and they are solved. Each day we come closer to the long-dreamed-of complete mastery of our newest environment—the air.

"In the comparatively short history of aviation it has been shown that the majority of crashes are not caused by mechanical faults but by the pilot's error. There are reasons for these failures. . . . It is important that the airman realize his shortcomings and weaknesses and learn how to compensate for or prevent them. When a crew takes to the air on a mission it leaves behind the flight surgeon. If one of the flyers fails through his own lack of knowledge and training, he does more than jeopardize his own life and the lives of the other crew members—he jeopardizes the safety of his country. A mission may fail simply because an airplane is flown at 28,000 feet instead of 35,000 feet as a result of one of the men developing 'bends.'

"The ancient Greeks, who strived for the ideal in physical and mental perfection, had a great motto: 'Know Thyself.' The flyer, by following these two simple words, will never fail either himself or his country."

Only Human

Retribution has fallen upon Pfc. Harry W. Siebels, payroll clerk of Hq. and Hq. Sq., Daniel Field, Augusta, Ga. As a payroll clerk we naturally supposed that Siebels enjoyed certain pleasures of the orderly room which are denied other brethren. Apparently not. After sweating out the payroll line recently, envisioning that whopping $54, minus deduction,

Siebels eventually came before the CO and rendered a lively salute. A moment later Siebels was slinking away empty-handed. He had been red lined.

ROGER!

Tech. Sgt. Richard R. True of Indianapolis has credit for 275 combat hours on fifty missions, and while his ship was damaged by flak or gunfire on every mission the sergeant and his crew never received a scratch. Sergeant True, a radio operator and gunner, now assigned as an instructor at Sioux Falls airbase, does not credit his fortune to good luck charms or magic potions. His simple explanation is: "I did a lot of praying."

PARACHUTES: LOST AND FOUND

Lost:

Nos. 42-62989, 42-310426, seat type, return to Office of Base Operations Officer, Army Air Base, Godman Field, Ky.

Nos. 42-323189, 42-330805, 42-335145, 42-389261, 42-699874, 42-70265, and 42-433705; communicate with Parachute Department, I Tactical Air Division, Hq. Det., Morris Field, Charlotte 2, N. C.

No. 42-393677, bears name A. L. Banko. Parachute left at Love Field, Texas, with civilian riggers on Jan. 1, 1944. Return to Sgt. A. L. Banko, Heavy Bomb. Section, First Proving Ground Group, Eglin Field, Fla.

Nos. 42-58009, 42-58016, type S-1; return to Maj. Gordon F. Keys, Jr., Flight Test Section, Middleton Air Service Command, Middletown, Pa.

Nos. 42-545266, 43-19407, 43-19479, 43-19751, QAC type; return to 1st Lieut. Eugene H. Duggan, Supervisor of Supply, CAAF, Childress, Texas.

Nos. 42-32114, 41-41388, type B-7; return to 312th Sub-Depot, Victorville Army Air Field, Victorville, Calif.

No. 42-599228, return to 32nd AAF Technical Training Detachment, AAF Western Technical Training Command, California Institute of Technology, Pasadena 4, Calif. Attention: Capt. Teddy F. Walkowicz.

Found:

Nos. 42-209285, 42-387755, 42-387743, 42-209318, 42-209327, 42-394133, 42-209287, 42-445890, 42-387630, 42-384011, 42-209337, 42-306570, 42-387846, 42-209326, 42-538498, 42-277220, 42-209286, 42-306554, 42-209339, 42-291791, 42-306674, 42-387867, 42-458832, 42-306702, 42-306659, 42-384020, 42-394294, 42-387785, 42-209304, 42-384048, 43-26320, 43,-187, AF43-27847, 8300-641000, 8300-635750. Communicate with Office of the Supply Officer, Headquarters 71st Sub-Depot, Key Field, Meridian, Miss. Attention: Lieut. Eugene E. Jackson.

STRIKES TWICE

It is seldom that the 14th Air Force is caught unprepared when the Japs raid their fields, but not long ago they did lose a P-40 by default. The plane had been parked on a repaired bomb crater when a rain came along and softened the earth. The P-40 sank into the hole. Before it could be hauled out, an air raid on the airdrome alerted all ships. Then, despite popular superstition, another bomb hit squarely in the hole of the original crater and blasted out the plane.—THE EDITOR.

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BRIEF

DEPARTMENTS

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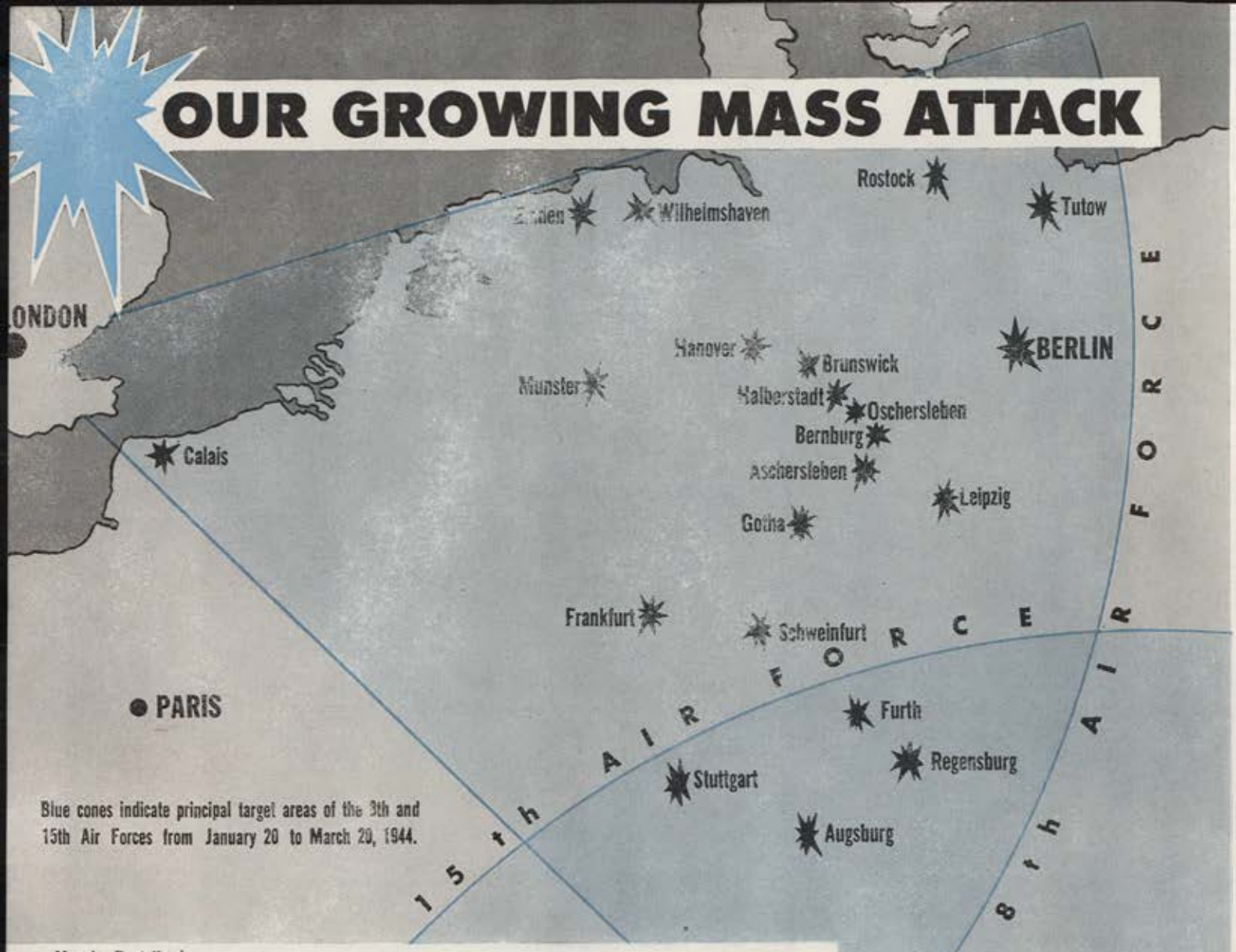


Map by Paul Reed.

Maj. Arthur Gordon, *Air Force* writer with the U. S. Strategic Air Forces in Europe, continues his monthly report on the air war in that theatre.

THE month of February left the Luftwaffe in the uncomfortable position of a starving man who has a few loaves of bread in the house but whose neighborhood bakery has burned down. As March began, air observers in Britain were waiting watchfully to see how the victim would use the resources left to him. Would he continue to eat as heartily as ever until the supply was gone, or would he weaken himself by adopting a stringent diet? That was the crucial question as the air war moved into the lengthening days of spring.

Our last dispatch from this theatre was filed just as the great February blitz on German production was reaching its climax. The date was February 25. That morning heavy bombers from the 15th Air Force, based in Italy, roared across the Alps to attack the Prufening Messerschmitt factory in Regensburg. One hour later the same target was hit by British-based heavies escorted by fighters making the longest round trip of the war. Other 8th Air Force formations attacked Augsburg, Stuttgart and Furth. The day was a landmark in the air war over Europe. More than 2,000 American planes, operating from bases 1,000 miles apart, were launched against Germany.

The six days between February 20 and February 25 were most significant in the history of strategic bombing. In some 3,800 bomber and 4,300 fighter sorties, the 8th and 15th Air Forces attacked factories whose estimated production was more than two-thirds of Germany's single-engined and more than three-quarters of her twin-engined fighters. The cost was high. On February 24 the 8th Air Force alone lost 49 heavies over Schweinfurt, Gotha and Rostock. The next day, when two American spearheads met at Regensburg, the 8th and 15th expended a total of 65 heavies over this and other targets. Altogether, in the cyclonic month of February, 250 four-engined bombers failed to return to their bases. But at the end of the month, looking at their PRU pictures

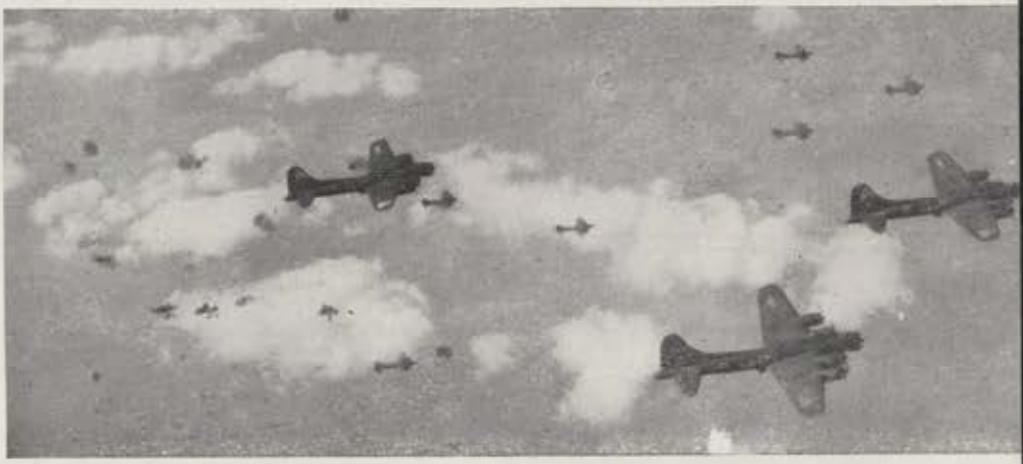
and damage assessments, the chiefs of the Strategic Air Forces knew that the price was not too high.

They knew without question that during February the wastage of the Luftwaffe's fighter strength exceeded its replacement capacity by a substantial margin. They estimated that the productive capacity of the Nazi aircraft industry as planned for March was down by at least fifty percent for an undetermined period. Just how long a period depended on the recuperative capacity of the Germans and the ability of precision bombers to return to the targets when factory repairs had advanced sufficiently to make it necessary. Even pessimists conceded that without further bombing the crippling effects of "Blitz Week" would last between one and two months.

This was not long but it might be long enough. If the strain on the Americans had been great, the pressure on the Luftwaffe had been almost unbearable. During February the American heavies claimed 540 enemy fighters destroyed in combat. American fighters, whose camera guns made reliable checking easy, shot down 365. There was little doubt that the German Air Force was taking a beating which it could not stand indefinitely.

This did not mean that the Luftwaffe could be discounted as a formidable fighting force. Its front line strength was being maintained intact, partially at least from stored reserves. Its pilots were still

Flyers from the villages of America, the open spaces and the streets of big towns have just learned that their target is "Big B," war name for Berlin. Solemnity, surprise and outright enjoyment show on the faces of these men who have come all the way to war so quickly from college, factory, office and store. Below, some of the U. S. 8th Air Force Fortresses pass through a flak-filled sky over the greater Berlin area en route to hit Reich industry and break the back of Nazi war production.



Berlin's Sportspalast (below), famous athletic arena, stands out beneath our raiders on March 6.

BERLIN

Encircled above are bombs crashing into the target area, the AAF's second attack on the Reich capital. Seeking to protect their ballbearing works and other vital installations the German Luftwaffe came aloft in great strength and fought with a ferocity they had never shown before. Six hundred enemy planes were encountered and the flak was accurate and intense. One Mustang group claimed 20 enemy craft destroyed. In all, escorting fighters knocked down 83 opposing planes.

Bombs (left) from American heavies start their descent toward an industrial target during the large-scale daylight operations against Berlin. Marked for this March 6 attack were important aero-engine ballbearing and electrical equipment plants around the Reich capital. Total weight of these bombs was reported to have been 1,500 tons, and the prospects of having their vital bearing plants destroyed brought the reluctant Luftwaffe into the air in respectable strength.

On March 8, bomber crews were briefed to strike Erkner, sixteen miles southeast of Berlin, and visibility was near perfect to attack this plant which produces one half the minimum annual ballbearing requirements of the German Air Force. Reconnaissance pictures taken two hours after the strike showed large fires in the plant and extensive damage to the only visible building. AAF aircraft encountered no opposition planes until they were deep inside the defenses of Germany.

Spread out like the center page of a travel folder, Berlin looked like the high spot for tourists in Germany on March 8 when this Liberator came down the twisting river Spree which flows beside the Tiergarten (left center), Berlin's counterpart of Central Park in New York City.

good, still brave. Those who read only newspaper headlines and expected the skies over Germany suddenly to be clear were bound to be disappointed.

As early as August, 1942, when the first dozen American B-17s were dispatched against Rouen, the Germans had seen the handwriting on the wall. By the end of that year there had been a definite shift in their aircraft production from bombers to fighters; that is, from offensive to defensive warfare. As the fighting grew fiercer their losses rose but foresight had put them in a position where they could keep production considerably ahead of attrition. By February, 1943, this production was booming along at the rate of several hundred planes a month ahead of losses.

The Americans knew they had to stop this. In July and August, 1943, they made their first big effort. It succeeded momentarily but by September, thanks to rapid repair work, bad weather and the husbanding of their remaining forces, the Germans were again in the black, and Americans had learned, somewhat to the confusion of the man in the street, that a destroyed factory could not be counted upon to remain destroyed. Even when precision bombing wrecked a building, some of the machine tools could be saved and put to work elsewhere in a matter of weeks. The Germans were proving themselves masters of the art of salvage. The miserable weather of November and December, 1943, gave them further opportunity to develop and exercise that art.

January was another story. The pressure of daylight bombing was intensified. The coordination between the daylight thrusts of the Americans and the nocturnal blows of the RAF grew more marked. It became almost routine for the AAF to spear a target by day and the RAF to bludgeon the same town that night. Augsburg, Schweinfurt and other cities learned this to their sorrow. RAF officials agreed that when AAF bombers preceded their night raiders British losses were appreciably reduced. The round-the-clock attack added to the strain on the German defenders. In February, the USSTAF finally got the run of weather for which they had been waiting four months. When the smoke of "Blitz Week" cleared away, experts estimated that German production was running almost as far behind wastage as it had been running ahead of wastage in the same month of 1943.

On February 29, Fortresses and Liberators made the third attack on Brunswick in ten days. They bombed through the overcast and enemy air opposition was practically nil. Only one bomber and six fighters were lost.

There were various possible conclusions to be drawn from this. The most probable was that the Germans were unwilling to expend their dwindling forces when bad visibility hampered the American effort. Instrument bombing had made great strides but was still no substitute for pinpoint visual bombing. Bombs dropped through the overcast could hurt Jerry but not enough to make him risk his precious aircraft. Another possible reason for the Germans' reluctance to fight was weather conditions on the ground. Sending up fighter formations through overcast, under severe icing conditions, was too expensive a pastime for the once prodigal Luftwaffe.

There was, however, a way to force the Germans' hand. Every indication was that they would fight desperately to defend their capital. So the Americans went to Berlin. They went in daylight and they went four times within six days. On at least some of the missions they hardly bothered to conceal their intentions. A fight was what they were looking for.

Luring the Luftwaffe into combat was only one of several valid reasons for daylight blows at the heart of Germany. The great ballbearing works at Erkner, in the suburbs of Berlin, was high on the list of priority targets. The ferocity with which the Germans usually defended Schweinfurt indicated the dependence of their war economy on ballbearing production. The attacks on these plants, coordinated with blows at aircraft industry, were designed to make the replacement of aircraft factories more and more difficult.

Then, too, there was the psychlogical effect to be considered. Berliners were reeling under night attacks by the British Bomber Command. If they lost their

Heavy bombers of the U. S. 8th Air Force head for home, leaving two Messerschmitt plants at Regensburg burning in one of the recent attacks on Germany's net of industrial centers. Every building at the Prufening plant and at least half of the installations at the Ober-Traubling factory were damaged. Prufening, largest producer of ME-109s, had been extensively repaired since the last AAF attack made on August 17, 1943.

Over two-thirds of the Ober-Traubling area was set aflame by the first group over the target, and later photographs revealed that all bombs had struck inside the area. The Focke-Wulf 190 fighter (left center) is one of the 35 to 50 enemy aircraft which came up to encounter our bombers. Most of the attacks were weak and took the form of passes, although two groups reported vicious and sustained opposition. There were intermittent attacks along route from the French coast to target. A newly built assembly shop was among the buildings heavily damaged.

Beneath the black pall of smoke which covered the related Messerschmitt components plant at Leipzig-Heiterblick are component erecting shops (1 and 2), small work shops (3 and 4), sub-assembly and dispatch center (5), component erecting shop (6), workshop or stores (7), boiler house (8), small shop or office (9), power house (10), machine shops (11 and 12), small shop and entrance to works (13) and main offices (14).

fancied daylight invulnerability the effect on their morale could hardly fail to be shattering. In any case, Berlin attacks would reveal whether the Luftwaffe would prefer to accept daylight bombing unopposed by anything except flak or conduct combat on a grand scale.

The first attack on March 4 was not a fair test. Appalling weather, with condensation trails that made formation flying virtually impossible, forced the recall of the bulk of the force. One formation slipped through escorted by fighters whose round-trip penetration of 1,200 miles exceeded even their Regensburg performance and set a new distance record for the war. Very few enemy aircraft were seen over the cloud-shrouded city. Fifteen American heavies were lost but only one as a direct result of enemy fighter action. The cold was intense. One gunner, whose oxygen equipment froze, died of anoxia. The first assault on "Big B," as combat crews called it, was at best a glancing blow.

Still, it gave jittery Berliners a foretaste of what was coming. Two days later, driving straight across northern France and Germany, a great aerial armada fought its way through opposition of unparalleled ferocity. American fighters guarding bomber boxes reported close to 600 enemy aircraft in the skies over Germany. Living on borrowed time, the Luftwaffe seemed willing to live—and die—boldly. Individually, its planes were no match for our fighters. One Mustang group over Berlin claimed twenty enemy aircraft destroyed, one probable and seven damaged, for no loss. Altogether that day escorting fighters knocked down 83 opposing Germans, losing 11 of their own. The score was somewhat equalized by the fact that a certain percentage of Nazi pilots could, and undoubtedly did, parachute to safety. Still, if any American fighter pilot wanted to claim that bombing Berlin without long-range fighter support would be prohibitively expensive, no bomber man would disagree with him.

Losses were heavy enough as it was. Some combat wings got through easily but others sustained fierce attacks from fighters and rocket-carrying fighter-bombers. Sixty-nine American bombers failed to return to England, the severest loss yet suffered by the 8th Air Force. A few cripples landed in Sweden. These losses were reported promptly with the grim honesty that has characterized Allied air communiques from the beginning. It was announced the next day that gaps in the ranks were already filled with replacements.

Proof of this was given on March 8 when another very strong force renewed that assault on the German capital. Again the Luftwaffe rose to defend it, but this time its claws were somewhat blunted and air opposition was somewhat weaker. Our fighter escort had another field day again, destroying 83 against a loss of 15. Our bomber losses dropped to 38.

Visibility was considerably better than expected. All crews had been briefed to hit the ballbearing plant at Erkner if they could see it. They all saw it. The factory and the surrounding area were literally smothered under 350,000 incendiaries and 10,000 small HE bombs. A lone American photo-reconnaissance pilot, who flew over the capital a few hours later, brought back pictures that confirmed the story told by strike photographs. He nearly failed to bring them back. In the sixty-below-zero cold his gas gauge froze. As he landed and tried to taxi to the dispersal point, his engine coughed and stopped—out of gas.

When released to the press, the figures on the number of bombs dropped caused various British newspapers to go into an arithmetical dither and come out with

GOTHA

In the big February 24 attack 8th Air Force Liberators and Fortresses struck Reich fighter plants and war production centers at Gotha and Schweinfurt, respectively. At Gotha the B-24s gave particular attention to the ME-110 plant, hitting ten of the fourteen buildings engaged in actual production. Bombs also were dropped on railroad equipment and a nearby airdrome. Fighting all the way to and from the target, the heavy bombers accounted for 83 enemy craft, while escorting U. S. fighters knocked down 37 German planes. This was a drama in three acts. The above scene is pointed up with an overlay of numbers to identify the waiting targets. Figure 1 shows a border of hangars. Buildings identified as probable assembly shops are marked by figure 2. Figure 3 points out a concentration of six aircraft production workshops, and figure 4 shows the location of locomotive, lorry and tank factories at Gotha. At lower left the second act is just underway.

Snow lends a winterset atmosphere to this target while some of the first bombs send up a billow of black smoke—heralding the destruction to come. Like the bull's-eye in a pistol target, the war plants of Gotha stand out in bold relief in the snow-white fields. A Liberator, silhouetted against the white background, passes across one of the largest ME-110 plants in Germany. Three wings of B-24s struck and left the scene at right.

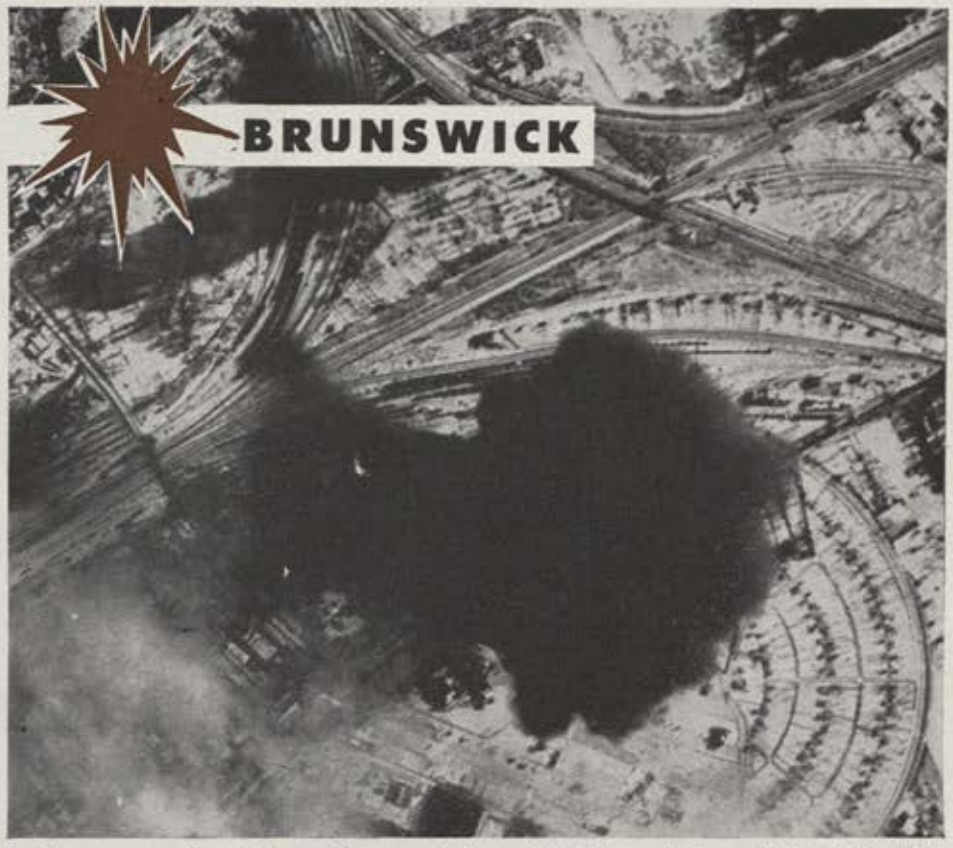
Four large fires raged in the target area, making an assessment of damage difficult. Flames were kindled in the aircraft production workshop while another factory on the west side of the field was hit. Later reconnaissance showed ten shops completely destroyed: six hangars destroyed and six others damaged; the tank and locomotive works largely destroyed. Flak was meager and inaccurate, but German fighters were bold and furious. They pounced quickly on any stragglers. Sixteen B-17s and 33 B-24s were lost.

headlines announcing 1,100 American heavy bombers over Berlin, a very considerable exaggeration although over 1,000 had been used in the great attack of February 20. Still, the actual number represented a tremendous striking power, especially when concentrated on a single target. Veteran crews flew beside newcomers to the United Kingdom who found themselves, to their astonishment, getting a good look at Berlin before they had even had a glimpse of London.

On March 9, when another force approximately the same size attacked Berlin for the fourth time, bombing through overcast, enemy opposition was practically nil. Only seven bombers and one fighter were lost. On the 11th, a relatively small force attacked Munster which was also cloud-covered. No bombers were lost at all. On March 15, only three failed to return from an attack on Brunswick. The British press began to speculate rather wildly on the whereabouts of the vanishing Luftwaffe. Some excited talk arose about the possibility of switching the RAF to day bombing. It is completely far-fetched at the moment but interesting as a weird reversal of the discussion that had taken place only a year before at Casablanca when the proposal was made to incorporate daylight bombers into the night air offensive. Meanwhile, USSTAF chiefs warned that weather was the main factor in curtailing German fighter activity. Events of the following week were to prove them right.

On other air fronts the crescendo was still rising. Ninth Air Force Marauders, supplemented occasionally by the heavies, were consistently hammering airdromes, railroad yards and rocket sites on the invasion coast. In Italy, heavies of the 15th were giving a beautiful illustration of the flexibility of air power with alternating attacks on long-range strategic targets such as Vienna and tactical blows such as the classic pulverization of Cassino on March 15. Nor was the RAF idle. It turned in some perfect examples of night precision bombing, dropping its new 12,000-pounders on munitions factories in southern France. On the night of March 15 more than 1,000 British heavies, carrying more than 3,000 tons, dropped the heaviest single bomb load of the war, with Stuttgart as the main target.

In the middle of the month, the dormant Luftwaffe woke up. On March 16, attacking Ulm and Augsburg, USSTAF bombers met stiff resistance. Twenty-two were lost. On the 18th a multiple attack on aircraft factories in southern Germany cost us 43 bombers, 16 of which made forced landings in Switzerland. The Luftwaffe was suffering, too. Two hundred and seven were claimed as destroyed in these two attacks but there were no signs of imminent collapse. The hungry



In the great attack on February 20, a record force of AAF heavy bombers hit aircraft factories at Leipzig, Brunswick and Bernberg, and other military targets at Gotha, Tutow, Oschersleben and similar points elsewhere in central and northern Germany. Pictures taken during some of the attacks indicate that damage was inflicted on at least six aircraft components and assembly installations.

Bomb bursts and fire above cover the Brunswick-Wilhelmometer power station of the ME-110 components plant. This big Sunday in AAF history, called "the most successful operation to date by the 8th AAF," found the German Air Force surprised and overwhelmed by such strength. The success was due partly to excellent reconnaissance which produced such pictures as Bernburg (below) showing planes and revetments, assembly shops (1, 2 and 5), boiler house (3) and storehouse (4).

Rocking Schweinfurt again on February 24 (above), heavy bombers piled additional heavy damage upon the industrial area surrounding the ballbearing factories, disabling dispatch buildings and marshalling yards. At the same time, Liberators were busy with ME shops at Gotha as clear weather over both targets permitted excellent visual operations. Thirteen bomber wings, led by Liberators, made the attacks, the B-24s encountering more than 100 enemy aircraft. Escorting fighters met sporadic opposition over most of route and AAF planes dropped 3,976,000 propaganda leaflets. We lost ten fighters and 49 bombers.

man still had a few loaves left. From this confusing pattern of enemy fighter reaction no clear-cut conclusions could be drawn except that the Germans were reluctant to risk their squadrons in bad weather. That the Luftwaffe was being steadily weakened was certain. Just how far from collapse it was, no one this side of the Rhine could say. For the Allies, the future held forth the promise of increasingly better weather and the opportunity to raise the tempo of the air war still higher. To the Germans it offered the bleak prospect of constantly waning strength and the constant necessity for concealing that progressive weakness, either by sulking on the ground or by sending into the air every plane that could be scraped together by stripping trainer and reconnaissance units, converting bombers to twin-engined fighters and reconverting fighter-bombers back to fighters.

IN the weeks ahead, visual strategic bombing would remain the prime objective of the USSTAF, with tactical bombing available when necessary. Overcast bombing would continue to be carried out whenever bad flying conditions did not outweigh its effectiveness.

For the Luftwaffe, the defense of key industrial targets would remain priority number one, with an apprehensive reserve always alert to meet the forthcoming invasion. There seemed little doubt that no matter to what extent he might rely on radio-controlled glider bombs or other devices to repel landings, Jerry would almost certainly try to maintain an anti-invasion air force.

To what extent he would succeed, time and the course of the war would tell. ☆

"Blitz Week" closed and the lessons learned were being studied for more violent attacks upon the war-starting Germans. If any American pilot was amind to claim that bombing Berlin would be too costly without long-range fighter escorts, then no bomber man would disagree. The fighter pilot came into his own during "Blitz Week" and here three Mustang men engage in a little "hangar flying" as they recount their deep penetration of the Nazi's aerial barricade. These fighter pilots have been to Berlin. They are Lieut. Robert L. Meserve, Sand Point, Idaho; Capt. Wallace Emmer, St. Louis, and Lieut. James J. Parsons, Seattle.

THIS IS YOUR ENEMY

New German Parachute ☆ Jap Pilots' Bull Session ☆ Nazi Air Policy

NOT QUITE ENOUGH ROPE. String savers in Germany are being advised these days to go after rope. The German Air Defense League has requested its members and others living in districts visited often by our bombers to collect parachutes and ropes which can be used in "sailing shells."

Nazi scientists have made a great many experiments with these shells which, they say, are more effective than barrage balloons. They make a kind of aerial minefield, being shot to the altitude of attacking formations. When they explode, a rope about 200 yards long attached to a parachute unrolls and sinks slowly to the ground. At one end of the rope is an explosive, which in case the "shell" doesn't hit anything, goes off before it reaches the ground.

DUCK THESE JOES. Commanders in the Pacific theatres are handing out stern advice about taking evasive action the moment any enemy planes are seen flying alongside our formations. The Japanese are using air-to-air bombing, and an observation plane is likely to be communicating altitude and airspeed to a bomber above our aircraft. In such instances, changes of altitude and airspeed as well as the usual weaving are in order.

WOODEN PLANES FOR THE JAPS. Radio Tokyo announced the other day that the Japanese are building wooden planes, which, the Japs contend, "are necessary as counter-weapons to radio locaters." The announcer stressed that the planes are needed in modern warfare and are not being developed merely because of a shortage of light metals. He mentioned the "Mosquito," a very successful wood job.

NAZI BOMBING POLICY. Goering, it appears now, has been over-ruled on a major point of air strategy. Hit-and-run raids by a small number of bombers have been abandoned for the most part in favor of big raids by a large number of aircraft.

Generalmajor Harlinghausen, who was in command of the Mediterranean units of the Luftwaffe in the Sicilian campaign, favored raids by large groups. He contended that continual small raids led to losses out of all proportion to their value and seriously weakened his forces. Harlinghausen was in favor of withdrawing bomber units from Sicily and North Africa to Italy and using them for occasional large scale operations.

Goering disagreed and removed Harlinghausen. Of late Feldmarschall von Richtofen, who has charge of the Mediterranean campaign, has backed Harlinghausen's ideas and has withdrawn his bomber groups to positions well behind the battle lines and apparently is conserving them for big raids.

GERMAN HANGOVER. The Third Reich, which got its start in a beer cellar, is running out of drinking stuff right at a time when the bierhaus characters could probably do with a couple of quick ones.

Beer is still being consumed in the normal tremendous quantities but no one is getting high. It is weak and watery, and only looks like beer. The heavy consumers say that after drinking a few gallons of it a man feels full up—that's all. Wine and hard liquor are expensive and hard to get. Champagne and brandy have been seen in expensive restaurants but the customers have to tip the barmen as much as they pay for the drink, which is plenty.

People have been told that the reason for the scarcity is that all available liquors have been sent to the forces fighting in Russia. The fellows in Russia who *really* need a drink are told that liquor is being held for the suffering population in Germany.

Actually, alcohol is being used for motor fuel.

THAT OLD NASU-NO-YOICHI. We have here an interview printed in *Fuji,* a magazine read by a number of Japanese only, we guess, when they have nothing better to do. Four flying officers are doing the talking and some of it is pretty good and quite a lot of it fairly honest. We present a few quotes:

"They used a machine called a 'bulldozer'," one fellow said of us, "which levelled trees and mounds just like a chisel-plane. One machine did the work of a thousand men, so that twenty machines with twenty drivers were as efficient as 20,000 men working here from morn until night. . . ."

"I have spent three years in training pilots," another was quoted, "and as a result of my experience, I feel that the Japanese are entirely suitable as pilots. Everyone acknowledges that the Japanese are clever with their hands, but I think that they are also much quicker in learning the knack of things than foreigners. Further—and this is my own personal opinion—in controlling a plane, a pilot's feet are the most important. In the sensitivity or touch of the foot, the Japanese are thoroughly trained from childhood through wearing 'geta,' walking on stilts or by other means. This is very convenient for controlling a machine. Our pupils come to us from the flying school at the age of seventeen or eighteen and in about three weeks they are performing solo flights. They go up with an instructor for a full five or six hours and then they can fly by themselves splendidly. For this purpose they also undergo various exercises on the ground, but even so to become so proficient in such a short time means they have a gift for it."

"You have only to look at their dancing," one man (who obviously had never spent any time in Roseland) said, "to know that the Japanese can move their feet far more nimbly than foreigners."

"Our greatest problem," said another, getting worked up, "has been the enemy's Boeing B-17 heavy bomber. We met these first in Burma, where Ashibara brought one down. Afterwards, however, they added some special equipment to them and they reappeared at Guadalcanal. We intended to treat them as before, but this time could do nothing against them. They were most insolent and overbearing in their behavior. Ships could not bring us supplies, so we were without food. If we did nothing, we should starve helplessly. By some means or other, these Boeings had to be brought down—such was our problem. In Japan, too, all the experts were assembled trying to devise a way to bring down a Boeing, but no good idea occurred to them. Yet to leave the problem unsolved meant that we should starve by inches. At last, on the front line, one was brought down by flying up against it. It was just then that I was going out to Guadalcanal. The enemy was afraid of this kind of fighting and so the Boeings did not appear again for some time. If they were struck all of a heap, they had no way of defending themselves. So for two

or three weeks they didn't appear. In the interval we completed our transfer from Guadalcanal without further loss. If the Boeings had been rampaging around we could not possibly have effected our transfer. When our experts in Japan heard about this, they couldn't contain themselves. By burning midnight oil, they quickly made the necessary alterations in our equipment and sent them out to the front line. When they arrived, knowing that something 'big' had come, we were quite excited. Afterwards, when the enemy came over, the commander-in-chief called up a certain pilot and said, 'You are the Nasu-no-yoichi of the Showa Era. Come back with the enemy destroyed!' The pilot was deeply moved, and mounting up in the plane he displayed the valor of a Nasu-no-yoichi and brought down the enemy at the first attack. . . ."

The most emotional note in the interview was sounded by Jiro Chikushi, a squadron leader, when he was talking about the necessity of killing us. (He calls Americans "Hairy foreigners.") Chikushi said, "If I had a son, I would say to him, 'Be an airman. If you can't shoot down the enemy's plane, then crash into him.' Only a parent could say that. . . ."

These wooden belly tanks for Japanese planes were found near the Munda airfield after it was taken by American troops. The tanks are of good design and light construction but vulnerable to 50 mm fire.

PLENTY OF GERMANS LEFT. Toward the end of 1942 the Germans reorganized their system of bomber crew training rather successfully and, no matter what else they might be short of, they have plenty of men for the bombers.

In changing their training methods the Nazis abolished the Gross-kampffliegerschulen (heavy bomber schools) and sent flying personnel directly from specialist schools to operations where they teamed up for the first time and got all their operational training.

This speed-up in training and lack of activity for many months has built up many heavy bombardment squadrons to a point where they can take a lot of losses without being crowded for crew replacements. Their greatest problem probably will be getting new planes.

PHOSPHORUS. One day recently in the South Pacific, a Zeke closed to within 700 yards of one of our bomber formations, then, from a two o'clock position, rolled over and catapulted an aerial phosphorus bomb from the belly of the plane. The bomb burst about 250 yards to the right of the formation and the explosion was accompanied by an orange burst followed by many white smoke streamers. One streamer hit the right wing of one of our bombers and burned off some paint while another damaged the nose of a bomber slightly.

SOMETHING THEY NEED. Some important developments in parachute design and use are being made by the Germans. One type, on which the pilot sits, opens automatically. When it becomes necessary to bail out, a catapult tosses the pilot (still in a sitting position) and the parachute away from the plane.

It is intended that when the bail-out takes place in rarefied atmospheres above 18,000 feet, the opening mechanism is delayed so that the pilot falls quickly through the space where oxygen is needed. If the pilot bailed out at low altitude, the parachute would open quickly. At normal altitudes there would be a time delay in opening so the pilot would lose some of the initial velocity and reduce the opening shock.

NO TRACE. In recent raids many Jap planes have not been using tracer bullets. This has made their shooting quite inaccurate, but often our fighter pilots (the ones who are careless about looking around) have not had any warning that they are being attacked until shells from a Jap plane rip through their ships.

'THE BLOOD-CURDLING HOWL.' A rather excited eyewitness account of the German rocket gun in action appeared in one of the Nazi newspapers recently. It is interesting both for the peculiar way it was written and the information it gives about the gun, which is called Werfer. The report follows:

"The whole battery—one salvo! The gunners in their fox holes 25 metres apart from the gun turn the key of the electric ignition switch: 'Fire.' A tremendous jet of flames hisses from six guns to the rear. In the same split second six rockets project themselves in a big arc through the night towards the enemy. They compare to fire-spitting comets with tails 400 metres long illuminating the landscape and blinding every eye. The blood-curdling howl still being felt, the ignition keys release the second, third, fourth, fifth and sixth salvos.

"In a few seconds 36 rockets are on their way to the enemy position, representing 36 heavy grenades. The battery then changes position within a few minutes. Due to the necessary quick action, aiming at the target cannot be very accurate. The small weight of the gun projectors renders the motorized or horse-drawn battery a unit of extraordinary mobility. It races towards the center of action, fires within a few minutes and moves out of the center in no time at all. The gun-projectors are of simple construction and not expensive to build.

"They resemble six short stove-pipes bound together and mounted on wheels. The grenade looks different from the usual type. It detonates close to the ground and is designed for splinter effect. The battery also can put up a smoke screen over a large territory. After a few bomb shells a single salvo of smoke shells covers the enemy position for several hundred metres deep and high up with a smoke screen. The destructive firepower of the battery combined upon open targets has a tremendously demoralizing effect upon the enemy."

DUMMY. In a nice bit of bombing which did us no good at all, our bombers flew over Rangoon Harbor at 22,000 feet and sank a ship. It was a dummy which intelligence officers believe was built by modifying a 250-by-34-foot cargo barge which had been lying in the port.

A few days after this dummy was sunk, the enemy made another one to take her place, a 200-by-27-foot job. It still looked like a barge, however, and we weren't taken by it. The Japs made a third dummy which looked even less like a ship, being only 140 feet long and 40 feet wide.

GHOST TALK. American formations on their way to bomb Akyab in Burma one day had instrument weather a good part of the way and radio comunication had to be maintained among the flights. A voice broke in, "We can't go into Akyab because it's covered over with clouds." The formation leader tried to find out who made the call but no one answered. About five minutes later the same voice called, "Where are you? Where is the rest of the formation? I'm lost."

The leader was smart enough to realize that something was wrong and he didn't answer. The Japs were figuring on our replying to the voice, thereby giving them information. ☆

One-Two-Three Punch

THE Florence-Rome rail line is the main supply artery for Nazi troops fighting below Rome. In order to check the flow of equipment to the Germans opposing our men in the Anzio beach area, AAF planes are flying constant strikes against bridges, terminals and rolling stock of the railroad. These photographs illustrate how a flight of B-26s hit a series of bridges along the southern end of the line, one after the other. About 25 miles due north of Rome, the Marauders blasted the railroad bridge at Civata Castellana. Then, following the path of the rail line, they next pasted the bridge at Montefiascone, twenty miles farther along the track. The bombers completed their mission by attacking the bridge at Orvieto, sixty miles north of Rome. The bomb pockmarks in the Orvieto picture are evidence of previous concentrated bombings in the bridge area; four more bombs are on their way to continue the destruction. As fast as the Germans rebuild the bridges, 12th Air Force planes blast them again. Arrows indicate the rail line. The winding, white lines are highways, often strafed by our aircraft. ☆

THE ZERO JOHNNY DIDN'T GET

Drawings by Capt. Raymond Creekmore

Even the best of our fighter pilots make mistakes but they know better than to make the same error twice.

THE flight of P-40s was on patrol at 20,000 feet over Rendova Island, protecting a newly won landing area. Twenty Jap dive bombers were sighted at about 8,000 feet, screaming down in a sharply angled dive. The tactical situation was ideal for the four Warhawk pilots. They were above the Japs, with the sun at their backs. The P-40s closed for the attack and broke up the Val formation. The Nips floundered around helplessly like sitting ducks, made perfect targets.

But not one Jap dive bomber was shot down.

The P-40 pilots had neglected to turn on their defrosters. Their windshields blurred quickly in the humid atmosphere and the Japs got out of the area without a single shot being fired at them. You can't hit what you can't see and you can't see if you forget to turn on your defroster. It was as simple as that.

ALL over the world, fighter pilots are making errors that result in enemy planes escaping certain destruction. Most pilots do not make the same mistake twice. When an error is committed, a lesson is learned—frequently under such grave circumstances that it is seldom forgotten. But some men continue to make the same old mistakes, violate the most fundamental rules of fighter tactics and get themselves and their formations into serious trouble. There are important lessons to be gained from the errors of omission and commission which have been made through over-eagerness, excitement or just plain unawareness.

You have heard a great many stories of how enemy planes were shot down. Here are some incidents wherein enemy planes were *not* shot down when they should have been, or wherein a fighter pilot faced trouble that could have been avoided. An AIR FORCE staff writer reports these incidents straight from the men who made the errors or who saw them made—from men who pass this information on to others in the hope that it might prevent someone else from erring, or dying.

Thirty-six P-38s were escorting B-26s over southern Italy. As the bombers went in to the targets, about forty ME-109s and FW-190s attacked. A rat race resulted between the flight of 38s and the Germans. One of the Lightning pilots saw two ME109s make a pass at the outside bomber element, pull up and begin to split S. The P-38 pilot did a wingover and started to chase the two Nazis. He was directly on the tail of one and had him all lined up in his sights when he was attacked directly from the rear by another ME. The P-38 pilot was a veteran of more than fifty missions, but he had forgotten one of the first rules of fighter tactics. He hadn't looked around. The ME in the rear hit his right engine and the pilot was lucky to get out alive. His is an old story; it happens every day.

Another P-38 pilot had a similar experience—except he wasn't so lucky. His flight was at 10,000 feet, returning from a morning fighter sweep. The sun was directly at the left, on a level and extremely bright. It was bright enough to hide the three enemy planes which came out of the sun, attacked the tail ship and shot it down. Another rule of fighter tactics had been violated—a pilot had not kept watch on the sun.

Consider another cliche of basic fighter tactics: never leave your formation. Everyone knows that. Yet our planes are still being shot down because some eager pilot wants to win the war all by himself and breaks formation to chase a "lone" enemy plane. Probably the oldest of enemy tricks is the ruse of sending a decoy plane below our fighters while a flight of enemy ships waits above, ready to pounce on the dope who leaves the formation.

Not only green pilots fall for that one. One case was reported in which the pilot was a squadron leader who had fifty missions and 214 hours to his credit. Four squadrons of P-38s were escorting sixty B-17s on a mission over western Sicily. The 38s were to the left of the bombers and about 2,000 feet above, flying line astern. No enemy fighters were sighted until the bombers had made their runs and were several miles from the target.

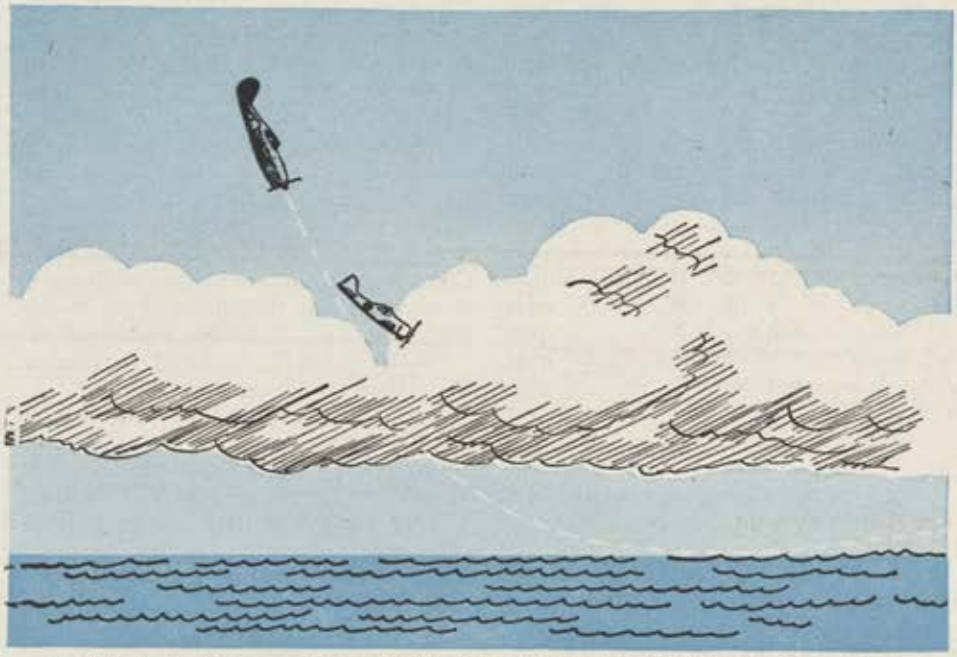
This Lightning pilot neglected one of the first rules of fighter tactics. He didn't look around when he went after two ME-109s. Another ME dove on him and he was lucky to get out alive.

Then the last element was attacked. The enemy sent one ME-109 beneath the fighter formation in an attempt to break up the element by luring one of our fighters down. It worked. The squadron leader peeled off and dove. Six more MEs came out of the sun and shot him down—just like that.

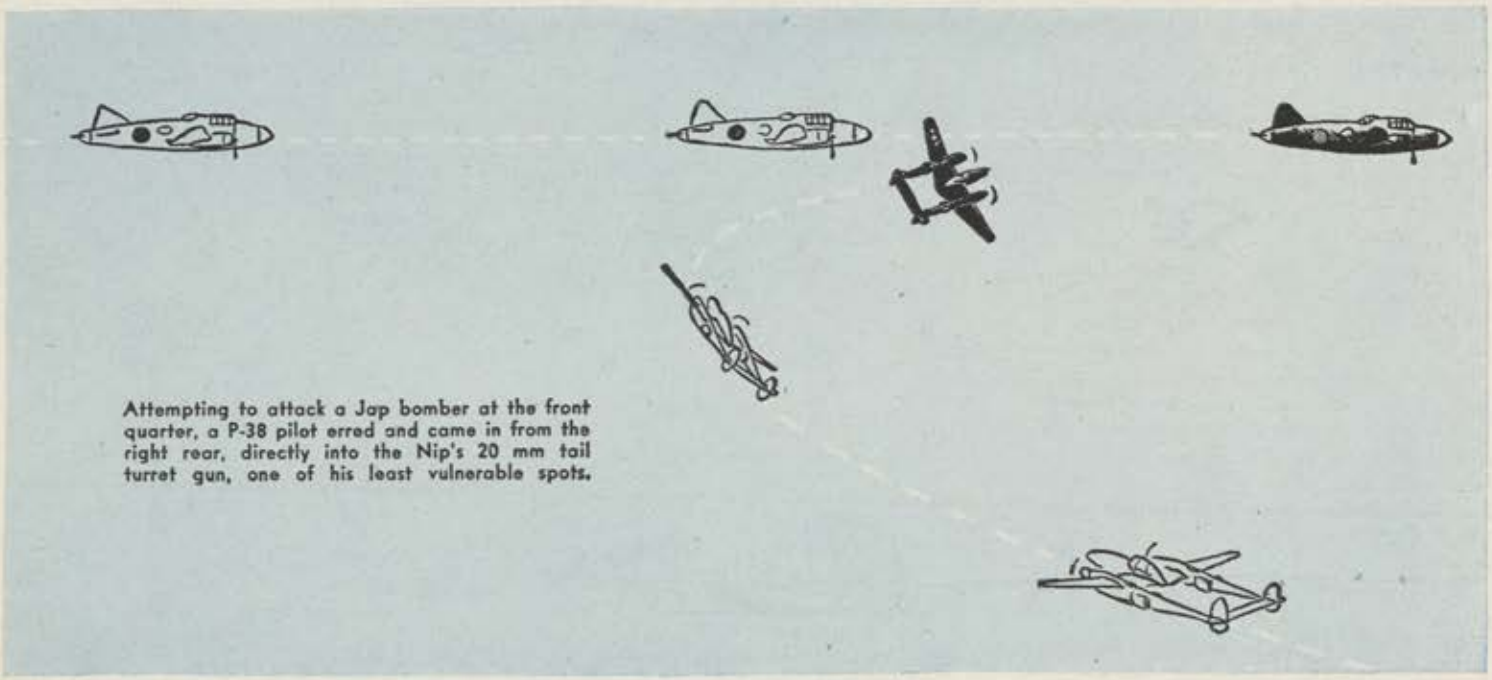
Then there is the P-40 flight leader who had his squadron at 10,000 feet over the Kihili airdrome on Bougainville. A flight of Zeros had attacked a dive bomber formation and the P-40s had intercepted. The Japs pulled straight up, and the flight leader followed on their trail. Without any previous warning, he made such a violent maneuver that his flight was unable to follow him. The wing man reported that when he tried to keep in formation, the pull up was so violent that his radio was shaken loose and all his breaker switches were pulled down. Consequently, the lead plane was off by itself and the wing man, not being able to follow, was left alone and unprotected. Two set-ups for Tokyo. Actually, the Warhawks got away in a blaze of luck that is seldom duplicated. The moral is obvious: Don't make a maneuver that every man in your element cannot predict and follow.

EAGERNESS is a major cause of combat errors. It appears under varying circumstances. A P-40 pilot (95 missions) was at 8,000 feet over Guadalcanal. He saw some dive bombers coming in low to hit our naval vessels on the northwest side of the island. His flight turned and trailed the Japs down. There were so many possible shots that he simply turned his guns on and kept shooting. But he had his guns firing so long that the barrels got red hot and began to work improperly. By the time he got some good targets in his sights, only three of his six guns were functioning effectively. Realizing his plight, he pulled up to get away and found only one gun working—and he had to fight his way out of the Jap formation. His guns jammed because the trigger was down so long that the barrels didn't have a chance to cool off. He was left practically unarmed in the middle of fifteen enemy planes. On the climb up, a Zero moved right in his path, but he couldn't do any damage with only one gun. A perfect example of being "trigger happy." Another case of lucky-to-be-alive. Neither example is recommended.

Another instance of being over-eager is reported by a Spitfire pilot who had 207 missions. He was at 10,000 feet when he saw an ME-109 at the same altitude flying away from him. The Spit pilot chased the Nazi but he started firing at about 600 to 700 yards, considerably out of effective range. As he states, "I should have opened my cannon at about 300 to 350 yards and held my machine guns until I was approximately 250 yards from him. By the time I was in proper range, I was out of ammunition. I was too eager. As a matter of fact, if I had been jumped on my way back, I probably



A Warhawk pilot on patrol at 21,000 feet over the Russell Islands made a serious error of judgment which resulted in the escape of an enemy plane and the near loss of his own life. He dove on a Zero and chased him down through an overcast. But when he pulled out he was right on the water and, by all odds, he should have gone in.



Attempting to attack a Jap bomber at the front quarter, a P-38 pilot erred and came in from the right rear, directly into the Nip's 20 mm tail turret gun, one of his least vulnerable spots.

would have been shot down. I had to hedge hop home."

Or, take this P-47 pilot on a flight over Paris. He was at 25,000 feet, escorting B-17s. About thirty FWs and MEs attacked. The pilot reports, "One of the FWs pulled up from the rear of the bombers and I had a perfect deflection shot. But all I did was knock his canopy off. I dived on him and he didn't even know I was there, because he took no evasive action. But I was too excited and overshot him. I was going about 350 miles per hour when I should have throttled back to between 250 and 275 mph. In that case, I wouldn't have overtaken him so rapidly and I would have had a longer time to shoot at him. There he was, a dream target doing straight and level, and me rocketing by him like Flash Gordon."

YOU may operate your aircraft strictly according to the book, but an error of judgment makes you as guilty as if you had neglected to lower your wheels for a landing. It's the results that count. A serious case of mistaken judgment is told in the story of a P-40 pilot on patrol over the Russell Islands. He was at 21,000 feet when he was informed of a flight of Zeros about fifteen miles away, losing altitude. He came down to 18,000 feet and attacked in his formation. The Jap flight became disorganized and soon airplanes were scrambling all over the sky. The Warhawk pilot saw a single Nip trying to slip away so he chased him. He did a mild roll and went down into an overcast at about 2,500 feet. But he came out of the overcast right on the water and, by all odds, he should have gone in.

Errors of judgment are as commonplace as the P-38 pilot who missed a setup because he misjudged the speed of an enemy plane he was about to attack. He was second man in a flight at 22,000 feet over Oro Bay in New Guinea. A Betty came along and the P-38 pilot figured he would attack at the front quarter and catch the Jap at his most vulnerable spot. But he was way off on his speed estimation, and he actually came in from the right rear, directly in the face of the bomber's 20 mm tail turret gun. The Lightning pilot got out in a hurry; he didn't get his Jap and he almost lost his neck.

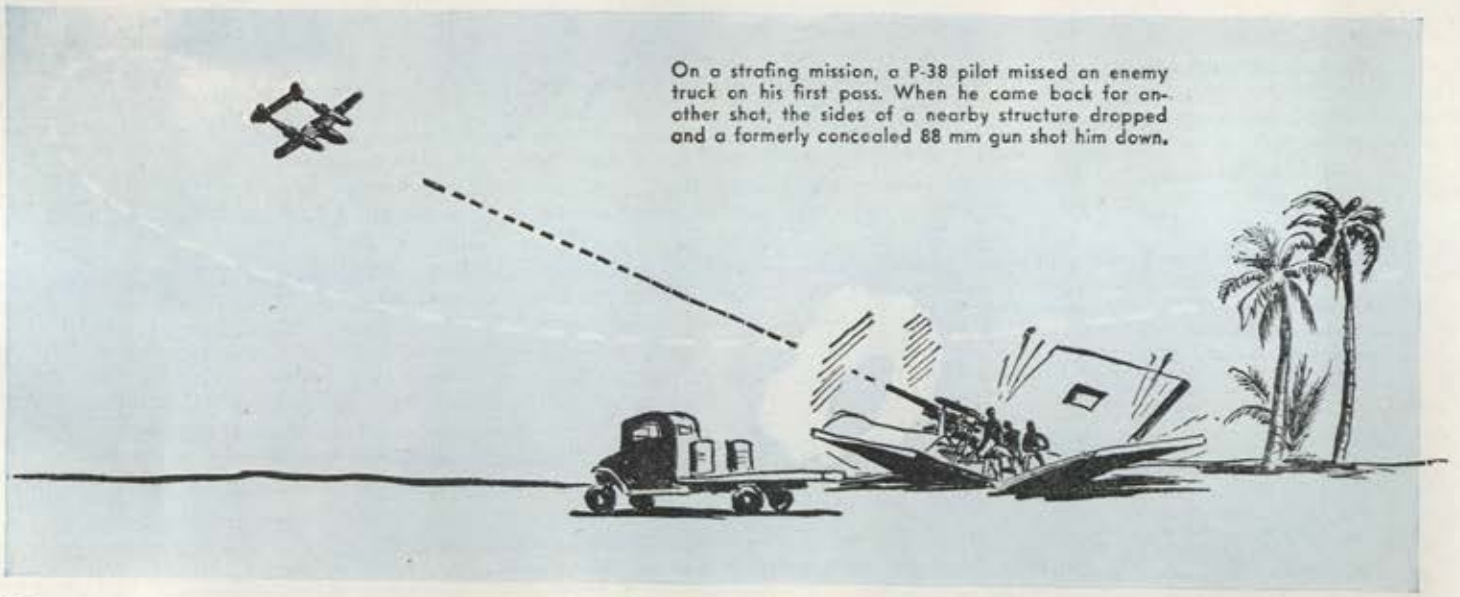
The speed of your aircraft is a fine thing if you use it properly. A P-38 pilot over Rabaul didn't, and he got himself into serious trouble. He was at 26,000 feet flying bomber cover when a flight of Zeros was sighted at 24,000, climbing into attack position. The pilot drove at a Zero at about 300 miles per hour. The Nip went into a tight roll to the right, and the P-38 pilot followed, going into a power dive. He relates, "I was going straight down and, not wanting to go any farther, I throttled back but my controls wouldn't operate. I was indicating 400 mph at 23,000 feet. I had one hell of a time trying to pull out of that high speed dive. Evidently, the effects of compressibility got me. I finally leveled off at 5,000 feet, but I shouldn't have gone down that fast."

Then, there are the men who literally talk themselves to death. A formation of Spitfires was over the coast of France at 15,000 feet, flying a loose V formation. Two of the pilots were talking to each other over their radios when the flight leader saw an FW break from above for the attack. The leader tried to warn the pilots of the approaching enemy ship, but the men were chattering away and he could not break into their jammed radios. Three times he tried to call them but each time he was unable to get through. So he just sat there and watched one of them go down in flames. The enemy ship was originally sighted about 4,000 feet above the formation, and there would have been plenty of time to take evasive action. Moral: Don't use the radio unless it is absolutely necessary. That one, too, is as basic as taking off into the wind.

It is also well to remember that on a fighter sweep speed and surprise are your defense. A P-38 pilot was on a strafing mission in Africa, hunting targets of opportunity. He came in low over an Arab house and saw a German truck beside it. But he had passed the truck before he had an opportunity to hit it, so he pulled up and came back. The Arab house collapsed and 88 mm gun poked out its nose and shot him down. He had automatically eliminated one of his greatest assets—surprise—and he gave the Nazis an opportunity to get set for him.

SOME errors are so perfectly obvious that they seem almost childish. Yet experienced pilots continue to make them. There was the P-38 pilot on his last mission in Africa. He was on his way back from the target when he decided to take off his oxygen mask. Two MEs jumped him and he couldn't get his mask back on in time to use the radio and call for help. He jammed his ship into a steep dive and was extremely fortunate to evade the enemy. Because he was only a hundred miles from his base, he figured he could relax. The enemy probably figured he was figuring just that.

And so they go. Nobody is perfect and mistakes are made by the best of them. But the enemy is tough enough without creating your own troubles. And in the air it doesn't pay to make the same mistake *once!* At least, that's the way a lot of 100-mission boys, who admit they are lucky to be alive, feel about it. ☆



On a strafing mission, a P-38 pilot missed an enemy truck on his first pass. When he came back for another shot, the sides of a nearby structure dropped and a formerly concealed 88 mm gun shot him down.

THE U. S. NAVY'S AIR OPERATIONS

These SBDs, lined up on the flight deck of a U. S. carrier in the Casablanca convoy, were among the planes which spear-headed the American landings in North Africa. The SBDs, among other jobs silenced the big guns of the Jean Bart, lying at anchor in the Casablanca harbor.

By Ensign Oliver H. Townsend, USNR

NAVAL AIR STATION, JACKSONVILLE, FLA.

An explanation of the organization and combat techniques of U. S. Naval aviation.

"Now hear this . . . Now hear this . . ." The words crackled over the big carrier's intercommunication system. They were simple words, but they had an electrifying effect. In the galley the cooks stopped peeling potatoes. In the ready room the pilots butted their cigarettes and reached for their flight gear. Down on the hangar deck the mechs pulled their heads out of the Wildcats and Avengers—and listened.

Those who were there said later: "It was a beautiful day for flying—like it nearly always is down there—with tall, white cumulus clouds coming out of the water like snow-capped mountain tops. We knew the Japs were around somewhere, but we didn't know just where, or just when we were going to contact them. When we heard the squawk box that morning we all knew this was it."

And it was. The announcement continued: "A large Japanese force including carriers has been sighted . . ." Even before the noise from the loud speakers had died away, fighters, dive bombers and torpedo planes, pre-warned over the intra-carrier teletype system, were roaring across the flight deck and heading off toward the enemy. High overhead the combat air patrol tensed itself for the aerial blow they know the Japs would try to deliver.

A dive-bomber squadron leader sang out over his interphone: "It's a beautiful day!"

The admiral had already given his orders: "Attack, Attack—Repeat, Attack!"

And the Navy swung into another aerial action against the Jap.

The outcome is already history. It was the Battle of Santa Cruz—one of the last major appearances of the Jap fleet before it was driven into hiding behind the island bases that ring its corroding empire. Maybe Santa Cruz wasn't the biggest battle of the war, and maybe not the most significant, but it was typical of the fighting spirit with which the Navy's flyers go into combat—and of the results they achieve. There the planes of a two-carrier naval task force blocked the Japs (with four carriers and the battle unit) in their strongest drive to retake Guadalcanal, and permanently crippled Japanese aerial authority over the southern reaches of their Far Eastern empire.

The job of the Navy pilot doesn't end with the big sea battles, however. You'll find him in the Hellcat clearing the skies above an Allied beachhead in the South Pacific. You'll find him in the PBY picking a tortuous patrol route amid the fog and williwaws of the Bering Sea. You'll find him in the little observation plane on a scouting mission over the enemy fleet. And you'll find him in the "baby flat-top" squadrons that ply the sea-lanes in search of Axis submarines. In fact, you'll find him on every ocean frontier in the world—wherever the Navy, to fight this war, has gone down to the sea in airplanes.

In spite of these many and varied aerial

In the ready room of a converted carrier, pilots spend their time working out navigation problems, playing gin rummy and bridge, or just dozing. When called, they get into action fast.

Each loaded with a 2,000-pound tin fish, these Avengers are ready for a target run. Torpedo bombing is tough work, but these powerful planes are built for the job.

activities of the Navy, there is no such thing as a U. S. Naval Air Force. Every tactical plane the Navy has in a combat area works for the U. S. Fleet and is under a fleet commander. There is no separate air organization, controlled through separate command channels, such as there is in the Army Air Forces.

But that is no indication that the Navy doesn't rate air power of prime significance. It does. Naval aviation this year will celebrate its 31st anniversary. In those 31 years it has grown from 201 officers and men in World War I to the point where today it has more than 25,000 planes and a pilot-training program with an "input" of 30,000 per year.

At sea, the aircraft carrier has established itself as one of the most vital parts, and often the nucleus, of the modern fleet. Because it has the longest offensive arm, it is the carrier the enemy wants most to destroy, and the carrier that receives maximum protection from the other ships of its own battle force. To better utilize their offensive power, many large naval units operate as carrier task forces, consisting of one or more flat-tops and a screen of cruisers, destroyers and subs. It is carrier task forces like these that today are providing the aerial cover for the Pacific amphibious attacks that in some cases reach out beyond the range of land-based air power.

"Big boss" of naval aviation, as he is of the whole Navy, is Admiral Ernest J. King, Chief of Naval Operations and Commander-in-Chief of the U. S. Fleet. Representing the airman and looking after his interests on Admiral King's staff is Vice Admiral John S. McCain, Deputy Chief of Naval Operations for Air. As such, Admiral McCain serves as assistant in aerial matters to Admiral King, and gives aviation a big voice in the overall direction of the Fleet.

Admiral McCain's office is the Navy organization that corresponds most closely with Headquarters, Army Air Forces. It contains the administrative offices and is the headquarters for Marine aviation and the Naval Air Transport Service. All in all, it handles the Navy pilot's training, the flight rules he follows and the jobs he is called upon to do—everything, in fact, but his airplane, which comes under the jurisdiction of the Bureau of Aeronautics, headed by Rear Admiral DeWitt C. Ramsey.

To get a rough idea what becoming a Navy flyer is like, it is worth taking a brief look at the training gauntlet each Naval air cadet must run: (1) fifteen weeks at a flight preparatory school for elementary ground instruction, (2) twelve weeks at a war training service school for elementary flight training, (3) eleven weeks at a pre-flight school for a mind and body "toughening-up" course, (4) twelve weeks of primary flight training and (5) fourteen weeks of intermediate flight training.

Here there is only a pause—long enough for the student to receive a pair of gold wings and a commission as either ensign in the Naval Reserve, or second lieutenant in the Marine Corps Reserve. But he doesn't relax—he still has eight tough weeks ahead of him.

Operational training is what the Navy calls the next phase. There, as in the AAF, men who have learned how to fly are taught how to fight. Their instructors are combat-wise veterans who learned their tricks the hard way.

After "operational," the Navy or Marine pilot is turned over to the Fleet and incorporated into one of its coordinated sea-air activities against the enemy.

But that doesn't mean he loses his identity as an airman. Each major fleet (Atlantic, Pacific and their various subdivisions) has its own air force and its own air commander. Under him the fleet air arm is broken down into groups and squadrons, some based on carriers (largely Navy), some shore based (largely Marines). Even aboard a carrier, however, the aviation group maintains itself virtually independent of the ship. Both naturally work in close cooperation, but each has its own skipper (air ultimately under the ship's captain), its own staff and its own job to do.

The five main jobs Navy and Marine flyers are called upon to do are fighting, scout-bombing, torpedo-bombing, patrol-bombing and observation (Navy only).

The fighter pilot's main task is to protect the Fleet and its shore installations from enemy air assault and to escort scout

and torpedo bombers on attack missions. He also has a number of supplementary duties, such as scouting, strafing and sometimes even bombing.

The plane he flies is either the Vought F4U Corsair, introduced in February, 1943, in the Solomon Islands area; the Grumman F6F Hellcat, which first saw action last September when a carrier task force raided Marcus Island, or the Grumman F4F Wildcat, scrappy little fighter that bore the brunt of the Japanese aerial assault in the Pacific for the first year and a half of war.

From the day of its introduction to the end of 1943 the 2,000-horsepower Corsair, primarily land-based, is credited with destroying 584 Jap planes in the air and on the ground. Only 108 F4Us were lost during this time. One Corsair squadron alone (the Marines' Flying Falcons) had accounted for 72 Jap planes while losing only two of its own pilots.

The Hellcat's record during its brief 1943 career was 300 enemy planes destroyed to 62 Hellcats lost. The score its first time out, at Marcus Island, was 21 Zeros to two Hellcats. It is results like this that have prompted Comdr. John Raby, air group commander of one of the Navy's biggest carriers at the Marcus raid, to declare that the F6F is "the finest carrier plane in the world."

Although the six-gunned, 400-mile-per-hour F4U and F6F, dubbed the "Terrible Twins" by the Navy, are now carrying the fighter load in the Pacific, it was the Wildcat that was in there pitching during the early, "so-few-against-so-many" days of the war.

The saga of the "F" began at Wake Island on December 7, 1941. There a small band of Marine pilots under the command of Maj. Paul Putnam, with an "air force" of four Wildcats saved from the first surprise attack, took a daily toll of the 27-to-50-plane flights of Jap bombers sent against the island—and made an occasional swipe at the Jap fleet for good measure. The overwhelming odds gradually whittled the F4F force down, but not past the point where one of the last radio reports from Wake said: "Our two remaining fighters aloft; several of the enemy accounted for."

THAT was the beginning. Since then the Wildcat has carried the fight to the Axis on all sea-air frontiers of the war. It was in on Midway, Guadalcanal, Casablanca, the Coral Sea, the Solomons campaign, and is still representing the Navy on the frontlines along with the new Corsairs and Hellcats.

The main job of the Navy scout bomber pilot is destruction of enemy carriers, warships, transports and shore installations. The destruction is carried out through dive-bombing.

In a sea battle between carrier task forces, the scout-bombers go in first (with fighter protection), blast up the flight decks of the hostile flat-tops and soften up their defenses in preparation for torpedo attack. In an amphibious drive they also spearhead the assault—strafing and dive-bombing enemy beach defenses.

As their name indicates, scout-bombers also perform another vital function: scouting. In periods of watchful inaction between battles, they range far out over the sea, combing the waves for a glimpse of the enemy. When they spot him a radio flash sends carriers and shore-bases into action, bringing bombers and torpedo planes to the attack.

Helping the pilot carry out his scout-bomber responsibilities is a radioman-gunner who occupies the rear cockpit. The plane these two use is either the new Curtiss SB2C Helldiver, which made an impressive debut in a raid last November on Rabaul, or the rugged old standby, Douglas SBD Dauntless.

In a Rabaul attack the Helldiver, biggest and heaviest dive-bomber ever used by the U. S., dropped 28,000 tons of bombs on Jap shipping in the harbor, sinking a light cruiser and a destroyer, probably sinking a heavy cruiser and severely damaging another light cruiser and a destroyer. In spite of severe attacks by huge flights of Zeros, the Helldivers fought their way home without loss to enemy action, and shot down three Zeros and damaged another in the process. Although two of the planes ran out of fuel and had to land in the ocean, all personnel were saved.

Still active on the warfronts, but now supplemented by the SB2C, is the Dauntless, standard Navy scout-bomber through all of the World War II. Like the Wildcat, it has seen action in all the big battles and is responsible for much of the success the U. S. Fleet has attained in the Pacific. Versatile, the SBD has turned in topflight performances as a dive-bomber, strafer and scout-plane, and has even been known to hold its own in dogfights with the Jap Zero.

Like the dive-bomber pilot, the torpedo-plane pilot has a primarily offensive responsibility. His is no simple task. Following the scout-bombers in an attack, he must bring his plane in at just the right height and release his torpedo at just the right time to get a hit. Not until the torpedo is away can he concentrate on getting out of there—which is exactly what he does next, usually by dropping down to wave altitude and pouring on the coal. As compensation for the risks he takes, he knows that the wound he inflicts is usually fatal.

Since the Battle of Midway, torpedo-plane pilots have flown the Grumman TBF Avenger, which replaced the TBD Devastator in June, 1942. In addition to the pilot, the TBF also carries a rear gunner (topside, rear) and a radioman-gunner who rides in the belly.

Because of the nature of their combat functions, torpedo squadrons have the reputation for being "suicide squadrons." They aren't. Outside of the Battle of Midway their losses have been surprisingly small. Lieut. Comdr. Edwin B. Parker, who flew with torpedo squadrons at the Coral Sea, Tulagi, Santa Cruz and parts of the Solomons campaign, says: "In all those actions we did not have a single plane shot down by enemy fire."

Like the SBD, the activities of the Avenger are not restricted entirely to its primary function. It also serves as a bomber and on several occasions has joined with fighter formations during a battle and held its own against attacking Zeros.

One of the most important non-torpedo jobs of the TBF is anti-sub patrol from baby flat-tops on convoy duty. For these assignments depth charges and bombs are fitted in the torpedo bays. One baby flat-top with Avengers and F4Fs aboard recently fought off an entire submarine wolf-pack in the Atlantic, getting two subs for certain, four very probables and four more probables. The convoy got through unscathed.

PATROL plane pilots are the "eyes of the Fleet." Patrolling is their main function, bombing the other. They fly big planes that can travel great distances and remain aloft for hours at a time. While on patrol they and their crews maintain a constant vigil for everything from enemy planes to submarines.

The Navy has a number of flying boats and land-based planes in its patrol-bomber classification, but none is quite so well known, or used quite so widely, as the twin-engined Consolidated PBY Catalina.

Although nominally a patrol-bomber, the PBY is really the workhorse of Naval aviation. It has been used for everything, both day and night, from dumbo hops (rescue missions) to laying mines and dropping torpedoes. Its characteristic parasol wing has hovered over the Aleutians, the Solomons, the Caribbean and the North Atlantic seaways. Its versatility is so taken for granted that no one even raised his eyebrows when Lieut. Robert Calrow won the Air Medal for "Dive-bombing Kiska in a PBY." Built to carry thirteen, PBYs on dumbo hops have taken off with as many as 37 aboard.

Big and slow, the PBY has learned to

The accompanying article on the organization and operation of U. S. Naval aviation was written for AIR FORCE by Ensign Oliver H. Townsend, USNR, Public Relations Office, Naval Air Station, Jacksonville, Fla., who formerly was a civilian writer on the AIR FORCE editorial staff.

A Navy PBY watches over the cold northern ocean, with the mountains of the Aleutians adding a touch of rugged background. The patrols demand long flying hours, call for perfect navigation.

stay away from the fast fighters of the enemy unless it has its own escort along. But that hasn't kept it from making some of the most valuable contributions to the war. It was a Catalina that first spotted the Jap fleet at Midway. It was a "Cat" that finally located the Nazi's Bismarck when it was trying to elude the British sea net. It was a "Cat" that made the final trip to besieged Corregidor. And it was a PBY from which Lieut. Donald Mason originated his famous report, "Sighted sub, sank same."

Besides the Catalina, the Navy also has two other widely used flying boats—the Martin PBM Mariner and the Consolidated PB2Y Coronado—and a number of land-based bombers. Both the PBM and the PB2Y perform patrol functions similar to those of the Catalina, operating from shoreline bases and from tenders far out at sea. They are also valuable as cargo and transport planes.

The Navy's land-based planes are used on anti-sub patrol and for low-altitude bombing and torpedo attacks. Chief among them are the Lockheed PV Ventura, the Consolidated PB4Y Liberator, the North American PBJ Mitchell and the Douglas BD Boston.

The smallest contingent of tactical pilots in the Navy are those assigned to the cruiser-and battleship-based observation planes. Small as their numbers are, their work is far from dull—and far from unimportant. Carrying a radioman-gunner in addition to the pilot, the main purpose of the observation plane is to spot targets for the gun crews back aboard their battlewagons. To do this they are generally carried aboard a ship in numbers of two or four, sent off by catapult and picked up by crane.

In the observation plane category the Navy has two current types—the Vought OS2U Kingfisher and the Curtiss SO3C Seagull. Also still in active use, although no longer manufactured, is the Curtiss SOC biplane.

One of the most noteworthy performances turned in by the low-powered Navy observation planes was during the landings in North Africa, Sicily and the Italian mainland. There, from ships sailing along the coastlines, they flew inland, strafing and giving the locations of shore objectives to the fleet. Over Sicily, Lieut. Paul Coughlin and his gunner, Dick Shafer, even rounded up more than 150 Axis troops with their little SOC and herded them to the American lines in an aerial "Sergeant York" act that is unequaled in the annals of air warfare.

In addition to the five main activities carried on by Navy flyers, there are a number of subsidiary services operated under the general heading of Naval aviation. The two most important of these are the Naval Air Transport Service, operating at present over routes totaling more than 60,000 miles, and the lighter-than-air service.

Lighter-than-air is centered at Lakehurst, N. J., and operates an authorized fleet of 200 airships. Its main jobs are anti-sub patrol, "convoying" convoys, laying mines and scouting. The airship generally used is powered by two radial engines, has a speed of over sixty knots and carries depth bombs and machine guns. Some have made trips of more than 3,000 miles.

Behind all the aerial activities of the Navy stand, as in the Army Air Forces, the ground crews and the flying enlisted men. Only petty officers perform the specialized jobs enlisted men are given to do in Naval aviation—jobs like aerographer's mate, machinist's mate, ordnanceman, radioman and photographer's mate. Aiding them in carrying out these duties in the continental United States are the Waves (Women Accepted for Voluntary Emergency Service). Already Waves are filling such important jobs as control tower operators, link trainer instructors and administrative clerks and assistants, and they are beginning to take over such "masculine" assignments as aviation metalsmiths and machinist's mates.

If all the operational and training policies of the Navy could be summed up into one word, that word would be "teamwork"—among aircrews, ground crews, airplanes and squadrons, and between air units and ships of the Fleet. Navy flyers are proud of this ideal of cooperation, and of their record of coordinated accomplishment, both among themselves and in conjunction with the Army Air Forces.

ARMY-NAVY air cooperation has been demonstrated in many different ways in many different war zones. Take, for instance, North Africa, where Navy planes made the first attacks on the continental airdromes needed by the Army for its land-based bombers and fighters, and Navy flat-tops brought Army fighters to within flying range of newly-won African bases. Or take the Solomons, where the Corsairs and the B-24s go out on raiding missions together. Or take the waters off the east coast of Japan, where Navy planes patrolled the skies while the Hornet, with General Doolittle's bombers aboard, raced within range of Tokyo.

Any Jap who was careless enough to be flying over Beaufort Bay at Guadalcanal on the afternoon of June 16, 1943, and who is still lucky enough to be alive, can tell you what Army-Navy air cooperation can really mean. He can tell you how 36 Army and 30 Navy fighters teamed up with eight New Zealanders that afternoon to knock down 77 Jap planes. Ship ack-ack added sixteen more and shore guns one—94 planes brought down in all. Allied losses were six planes and four pilots.

To this action the Navy Department wrote a terse but fitting postscript—one that may well apply to future accomplishments as well as past:

"This air victory was a striking example of coordinated battle action by the various units concerned." ☆

TRANS-OCEANIC FLIGHT

By Lieut. Wm. T. Lent

A weary band of travelers checks in at customs after a grueling twelve hours over the sea. Broadway strip-artist and USO charmer Babs Tobler blushes indignantly while the "eager-beaver" customs official checks her personal effects. Waiting behind her are a trophy laden Marine private and a Hq AAF major with portfolio and two-day beard.

To help pass the tedious hours, the inevitable poker game is organized. Rank is relatively unimportant here and a brace of aces can be an effective equalizer. Captain Wilson just pulled to a straight flush and cordially invites Ensign Luerich to make the fracas a joint Army-Navy affair.

The above scene is a figment of Pfc. Doherty's subconscious mind as he dozes aboard the crowded transport. Instead of ill-fitting bucket seats, the "dream ship" would have luxurious reclining chairs with a pretty flight nurse as hostess. To make the scene complete, flunkies Hitler and Tojo would await his beck and call.

Stormy weather usually occurs at meal-time. Thus an extra hazard is added to the problem of consuming the box lunch, which might include a couple of stale Spam sandwiches and a slice of indigestible apple pie. The fact that few casualties result from this meal is a tribute to the hardy American constitution.

Sleepy-time aboard the C-54 presents an eerie sight. Lifeless-looking bodies are sprawled about the ship in every conceivable position, vainly seeking rest and sleep. Above the drone of the propellers is heard the snorers concerto—music which does not appeal particularly to the more sensitive soul who is still awake.

Sweating out the ship is an arduous procedure that often lasts for hours. Here we find a BG in difficulty over the weight limit on baggage, while behind him a "Short-Snorter" seeks a signature from a Hollywood canary. In the background Allied staff officers engage in tactical discussion. Corporal Cady hasn't slept in 36 hours in expectancy of this long-awaited trip back home.

'FLYING SUBMARINE'

By Maj. Arthur Gordon

AIR FORCE Overseas Staff

How weatherbird B-17s skim the waves and penetrate the storm clouds of the Atlantic on weather reconnaissance flights to prepare the way for bombing attacks on Europe.

THERE is a Flying Fortress outfit somewhere in England that has never fired a shot at an enemy plane and probably never will. The crews have no hair-raising stories to tell of engines shot out over enemy territory, of casualties from flak or rocket cannon fire.

Yet the work of the particular unit may determine whether a thousand warplanes are dispatched against the Reich. It may have a distinct bearing, one of these days, on the zero hour that the world is waiting for—the hour of invasion. And despite the absence, so far, of enemy opposition, the missions carried out by these B-17s can be hazardous in the extreme. They make the longest operational flights in the business; 2,000 land miles is a routine distance. And "land miles" is just a figure of speech. Most of the fourteen or fifteen hours of the flight are spent over the steel-gray waters of the Atlantic—waters that at some times of the year will freeze a man to death in a matter of minutes. Exactly where these Fortresses go, and when, must remain undisclosed for purposes of security. But the reason for these tremendous hops can be told.

That reason is weather.

THE weather that blankets Europe at any given time is a product of the air currents and pressure areas that coil and form far out in the misty Atlantic. In these days of self-imposed radio silence, trans-ocean shipping is powerless to relay the reports that were invaluable to weather forecasters in peacetime. Yet those forecasters must know what conditions prevail to the westward if they are to be able to tell the air chiefs what to expect in the way of cloud conditions over airbases and over targets, what winds will be encountered at what altitudes, what abrupt weather changes to expect.

So they send out planes. The British have been dispatching weather flights for years, using several types of planes. The Germans dispatch them too, long-range planes like the giant Focke Wulf Kurier. The B-17s go farthest of all.

They carry a crew of seven or eight, a full complement of armor plate, .50 caliber machine guns and ammunition, and instead of a bomb load, they carry bomb bay tanks of fuel in addition to regular wing and Tokyo tanks. Since gasoline weighs over six pounds a gallon, the total load at take-off is staggering, more than the combat Fortresses carry; it is, in fact, the maximum that the straining engines are supposed to be able to hoist into the air. There is no margin for error. If an engine falters on the take-off, it's just too bad. That happened not so long ago. No one survived.

There are other hazards beside the take-off. Weather observation calls for periodic sampling of air pressure, temperatures and the like at the lowest possible altitude. This means that at certain intervals on any given flight the Fort swoops down so low that the waist gunner can taste salt spray on his lips and the roar of the engines comes reverberating from the ocean sometimes less than fifty feet below. "This ain't no airplane," said one gunner feelingly after his maiden voyage, "this is nothin' but a flyin' submarine!"

There's no great trick to such low-level flying in daylight, but on a dark rainy night it calls for a certain faith in your instruments to watch the needle on the altimeter creep lower and lower and try to ignore the shrinking feeling you get just about where the seat of your pants touches your parachute. Or, if you can't ignore it, pray for the "met" observer, performing his mysteries in the plexiglass nose, to make his readings quickly and give the welcome word over the interphone that will allow the pilot to send the B-17 zooming into blackness and safety.

In 2,000 miles any aircraft will meet with a lot of weather, and over the Atlantic in mid-winter some of it is bound to be bad. This does not upset the weather flight crews unduly; weather is what they are looking for. But when severe icing conditions are encountered, or when a wind that has been a head wind all the way out suddenly shifts and becomes a head wind all the way back, then there may be some anxious moments.

It is a tribute to the maintenance crews and the stamina built into the planes that in all the thousands of miles of flying, only one B-17 remains unaccounted for. That one simply failed to return; no one knows what happened; there were no distress signals. Just silence. Two of the planes have crashed on land, one on the take-off, the other in southwest England when, flying blind, it failed by a heartbreaking five feet to clear a mountain top. Three of the crew of this Fortress were injured, the others killed. Recognizing these dangers, 8th Air Force Headquarters has ruled that every twenty hours of weather flying should be considered the equivalent of one combat mission. Thus, after a certain time, the crews will have completed an operational tour of duty and will be grounded or returned to the States.

Most of the crew members are volunteers taken from Combat Crew Replacement Centers. They make the choice deliberately, balancing the long monotonous flying hours, the lack of glory and the dangers involved against the basic importance of the work and the value to pilots, navigators, radiomen and engineers of such grueling experience. The gunners, spoiling for combat and feeling—quite rightly—that their flying time isn't doing them much good, get restless occasionally and require a brief fight talk from the CO. They usually snap out of their discontent quickly and go back to scanning the empty skies in the hope that the million to one chance will occur and they will lock horns with a German plane on weather reconnaissance flight.

Now and then they get a whiff of unexpected excitement—such as the day one of the Forts shot out of a cloud too close to a big Allied transport—a famous prewar luxury liner—and got a hot reception of flak and tracers before recognition was established. Or the rare occasions when they get a radio order to search for survivors of some torpedoed vessel. But more often the thrill proves to be a flash in the pan—mysterious lights on the water at night turning out to be nothing but the Irish fishing fleet, or the "flare" excitedly announced by the tail gunner nothing more phenomenal than the planet Venus rising from the foam.

The routine of this American weather outfit has become fairly well established. There is more than one flight each day—weather permitting—and the flight is often carried out in the face of conditions that would keep the combat Fortresses securely grounded. The trip is timed so that the information obtained at the maximum distance can be used in planning forthcoming day or night raids on Germany. But actually all the armed services make use of the information supplied by these and other weather flights. The reports, coming in continually from different "tracks" flown are coordinated and analyzed by British and American weather experts. They are invaluable to the two air forces, to both navies and to any form of combined operations.

An American weather flight begins at an airdrome in England that is like dozens of others scattered the length and breadth of the land: a few hundred acres of flat farming country criss-crossed with runways and dotted with dispersal points where the big ships stand ready. If it is winter, the twin nightmares of mud and distance have to be faced. Still, they're not so bad if you have transportation, and the CO of an operational unit is sometimes entitled to a jeep.

THE mission actually begins several hours before take-off time with the briefing. It's not very elaborate: a forecast of weather conditions likely to be encountered, a shipping situation summary giving position of convoys that may be met, the radio call signals of the day, and so forth. When the crew is at its home base a specially assigned intelligence officer conducts the briefing. If it has landed at another airdrome the unit commanding officer may give the briefing himself, having received the information by phone.

After briefing the crew disperses for food and as much sleep as the time of take-off will allow. At breakfast the atmosphere is completely relaxed, in sharp contrast to the tension before a combat mission. Officers and non-coms kid each other about alleged amatory exploits. The camaraderie persists as they drive out to the hardstand where the B-17 is waiting, with a stencilled row of miniature weathervanes on her nose, each symbolizing a successful weather flight, barely visible in the dim light.

Only the British meteorological officer is somewhat aloof. Not unfriendly but rather shy, as might be expected when a lone Briton finds himself in an air crew with seven uninhibited Americans. Tall and rather awkward, he pulls a British helmet down over his ears and crawls into the B-17 carrying a bag which contains his meteorological tables and a thermos bottle that almost certainly contains tea. He makes his way forward into the plexiglass nose of the bomber and draws a curtain behind him so that the light from the navigators table will not affect his vision. He sits up there on his little stool confronting his instruments: an aneroid barometer that records air pressure in millibars, a cyclometer which consists of two thermometers, one air and the other wet-bulb, a pressure altimeter and an air speed indicator. Every fifty miles through the darkness of the night—and the daylight hours, too—like some high priest of weather, he will perform the ritual to which the whole mission is dedicated. What he observes in the way of temperature changes, wind veers and cloud formations, all details of vapor trails, icing conditions, warm and cold fronts, is carefully recorded.

Behind the "met" officer sits the navigator. He is the next most important man of the team. He has secret equipment to aid him in plotting his position while the Fortress is fairly near land, but for most of the distance he has to rely on dead reckoning and celestial navigation.

The main worry of the pilot and co-pilot is getting the big ship off the ground. Once they have a few hundred feet of altitude they can relax. But beforehand they check each engine carefully. If any of the engines seems to be running rough they will not risk a take-off. An alternate Fortress is always standing by. Rather than take chances they will transfer to it. *(Continued on next Page)*

No combat plane receives more careful attention than heavy bombers which plot the weather. Mechanics here make a ship ready.

Weather data recorded on daily flights is needed in raiding Germany a few hours later. British "met" observers fly with AAF crews.

In the radio room, social center of the ship, the non-coms are gathered for the take-off: engineer, radio-men, ball-turret and waist gunners. On the floors are stacked provisions looted from the mess to keep the crew from being hungry on the fifteen-hour trip: bread, butter, peanut butter, jam, self-heating soup, cheese, candy bars—hardly a balanced diet but a lot better than nothing.

Of these four men, the radio operator is probably busiest throughout the long trip. The waist and ball-turret gunners share the job of dropping smoke bombs to calculate drift. Sometimes they test their guns by shooting at the bombs.

By dawn the B-17 is far at sea. Daylight grows slowly; the bomber is racing westward almost as fast as the sun. "George," the automatic pilot, flies the ship except during the let-downs to fifty feet when a human pilot—and a good one—is called for. The sea is usually empty except for occasional birds which appear even in mid-ocean. Sgt. Tilman O. Lawr, red-haired tail gunner from Des Moines, has his own theories of how they manage it. "Geez," he exclaimed on one occasion, "those birds must carry belly-tanks!"

At the outermost point on the weather track the Fortress takes its usual "met" samples on the deck and then begins to climb to altitude. At 12,000 feet the crew goes on oxygen. At the required altitude the pilot levels out and for the next two hours, headed home, the B-17 stays upstairs. There are violent winds in the troposphere as a rule, usually blowing from west to east, so the trip back may be shorter by one or two hours. If the home base is closed in, the crew will be directed by radio to another base.

Sometimes they land at an RAF station where they always get a royal welcome despite their somewhat disheveled and by now unshaven appearance. And for practical furtherance of Anglo-American relations, there is probably nothing better than these occasions when Americans, like Second Lieut. Albert H. Ownbey of Hickory, N. C., or Staff Sgt. Angelo M. Nicoletti of Brooklyn, N. Y., or Second Lieut. Sam Nudelman, who used to run a clothing store near Scranton, Pa., drop out of the sky and spend an evening shooting the breeze with boys from Birmingham or Bristol or Barrow-on-Humber.

The crew is likely to be tired after a weather flight; fifteen hours is a long time in a bomber built for things other than comfort. But they get the next day off and they can paint another weather-vane on the nose of their B-17. Above all, they have the satisfaction of knowing that, even though they have nothing to show for their work except a few lines on a weather map, those lines are all important to the job of winning the war. ☆

BE A BOTANIST ON THE SIDE

THIS is an appeal to soldiers stationed at northern bases.

Several northern plants which can serve as emergency fuel and food are described in various survival booklets available to AAF personnel. Your ability to find and use these plants properly is a survival skill almost as important as knowing how to use your parachute. The AAF Arctic, Desert and Tropic Information Center is engaged in checking and improving survival information. The data on northern plants is inadequate because pre-war travellers were not thinking about the survival of soldiers when they gathered information. We want to have the benefit of data supplied by soldiers in the field.

You can help by supplying the following information on the plants illustrated here, and others which you know to be useful in emergencies:

1. Gather enough edible plants for a fair meal, or sufficient fuel plants to cook one meal. How long did it take you?
2. Describe the plant and its habitat, giving its size and the characteristics which helped you find it and may help other soldiers find it. If possible get a photograph of the plant.
3. Collect a specimen of each plant so we can be certain that you identified the plant correctly. Press it in a newspaper or magazine until dry and then mail it in an envelope along with your description. Consult your postal officer for mailing regulations.

Other food and fuel plants on which we need information are white heather, licorice root, bistort and reindeer lichen. If you hear of other useful plants from settlers or natives, tell us about them. Send your data and specimens to the ADTIC, Headquarters, Army Air Forces, 25 Broad Street, New York 4, N. Y., attention Dr. John W. Marr.

THE ADTIC is often asked to supply general descriptions of the vegetation of specific regions. If you are interested in observing your surroundings and writing about them, you can supply ADTIC with information that is urgently needed. Many soldiers are stationed in areas which botanists or even casual travellers have never visited. Even in the cases of areas scientists have studied, the descriptions on hand often do not supply the type of information needed. Your reports should cover:

1. Descriptions of each type of plant community (forests, meadow and so on), giving the relative abundance and size of each type of plant.
2. The date on which buds of trees and shrubs open and flowers bloom.
3. The appearance of the plants in the winter. — AAF Arctic, Desert and Tropic Information Center. ☆

KAMCHATKA LILY

One to several feet tall.
Dark red or purple flowers.
Stems slender, sometimes vine-like.
Grows in meadows mixed with grasses.
Occurs on Alaska coast, Aleutian Islands and in Siberia.
Boil or roast the root.

CROWBERRY

Creeping shrub.
Branches rise two to three inches at tips.
Leaves needle-like, short and very close together.
Grows in all types of tundra, sometimes partly buried by lichens.
Occurs throughout the north.
Stems and roots make good fuel.
Berries are edible; best when cooked.

LOUSE-WORT

Five to eight inches tall.
Pink or purple flowers.
One plant may have several flower stalks.
Grows in tundra.
Occurs throughout the north.
This root is the most tasty northern plant food.
Boil or roast the root.

A PERFECT RAID

This Thanksgiving Day feast over Formosa will long be remembered.

☆

By Col. Clinton D. (Casey) Vincent

14TH AIR FORCE

THE Thanksgiving Day blasting of Formosa's Shinchiku airdrome was the deepest penetration of the internal communication and supply lines of the Japanese to be carried out by the 14th Air Force, and the most successful mission ever conducted against Jap aviation by our China-based planes.

Planned as a surprise raid with secret and meticulous care, the attack was executed without loss. Employing 29 aircraft, we destroyed 42 enemy planes and probably destroyed or damaged a dozen more in this first strike at Formosa.

With forecasts of but three days of good weather over the area within a month, the 14th Air Force jumped into high gear with a report from the weather detachment that Thanksgiving Day would be clear. On November 22 and 24 our reconnaissance planes brought back pictures of Shinchiku, revealing more than eighty aircraft, mostly medium bombers, on the field. On receipt of the first pictures we called together our tactical air staff and planned the day, approximate time, fighter and bomber strength and the bomb load of the mission.

On the morning of November 25, fourteen Mitchells, six from a Chinese-American squadron, took off from an advance base and kept rendezvous with fifteen fighters. The raiders then flew to the China Sea coast where they dropped down to skim over the whitecaps to avert detection by Jap locators.

Success of our mission at that point hinged on surprise which, in turn, depended upon perfect navigation. If spotted, the mission could turn into a costly failure since we were flying into a hornet's nest of Japanese air power.

Any anxiety, however, came to an end when we hit the Formosa coastline at precisely the right place and time. The fighters dropped their auxiliary fuel tanks and sped ahead in preparation for their battles. Bombers and the trailing formation of fighters climbed to 1,000 feet for their bombing and strafing attacks as the entire formation lined up on the target.

A squadron of P-38 fighters was leading, while the B-25s followed with their loads of fragmentation bombs. A fighter squadron came last to protect the Mitchells from rear attacks.

Upon approaching the target the P-38 leader spotted a lazy traffic pattern of ships waiting for landing instructions over the field. With his first flight, he joined the pattern, moved up on a bomber's tail, pressed the gun button on the stick, eased up behind another bomber, squeezed the button again, banked around to line up on a fighter just taking off and squeezed the button again. Score: three Jap planes destroyed. Meanwhile, his fellow pilots were knocking down other ships, accounting for nine by the time they had passed over the target.

So complete had been the surprise that by the time the second wave of P-38s charged over the field they noticed some 200 Jap mechanics just breaking for cover. In a deadly buzz job, this flight blasted ten more enemy planes into flames.

B-25s then dropped their fragmentation bombs among the parked planes and scurrying mechanics. Three B-25s, banking away from the target, turned their guns on a barracks area and an engineer-gunner knocked down a Zero during the action. The last two Zeros in the air were shot down a moment later.

Despite smoke and flame over the target, the trailing fighter formation moved over the field and fired five more Jap bombers, probably destroyed a sixth and damaged at least three more.

In three minutes of fast action nineteen bombers, eight fighters, two transports and one Stuka dive bomber were destroyed, one bomber probably destroyed and three others damaged by gunfire in the air. Fragmentation bombs riddled and ignited between twenty and thirty other planes on the ground.

The only damage received by our planes were small arms hits on three B-25s and a bent wing on a fighter which hit a tree in its strafing run over the field.

Two Japanese versions of the raid were broadcast. One newscaster reported an attempted strike on Shinchiku airdrome in which the Japanese forced the raiders to turn back before reaching the field, shooting down two American aircraft. Another enemy radio report was less modest. This broadcaster reported that our bombers were forced to jettison their bombs before reaching the target and all, except one, were shot down. Such perverted claims were additional proof that the Japs had been severely jolted.

It was a perfect raid. ☆

'One of my boys'

By Capt. N. W. Pinney, Jr.

84TH BASIC FLYING TRAINING SQUADRON, GUNTER FIELD, ALA.

An instructor's thoughts after reading a headline.

I WAS relaxing at the club last night after another six-hour, five-student flying period and just by chance I happened to see his name in the evening paper.

There was quite a headline telling about the big Ploesti raid, and in reading it I caught one name that was very familiar. The story said something about this pilot being one of the war's great aviators and mentioned that he had been flying a B-24 when his crew blasted their target to bits. I ran the name through my mind again and again, and at first I could not sort him out from the many students I had helped train. However, I knew he had been "one of my boys" so I settled back comfortably and tried to recall him more clearly.

As I went back a year or so, I remembered him as a tall, skinny kid with an unruly mop of hair. He was always getting gigged for that hair, even if he *did* get it cut once a week. When I first met him on the line he seemed such a young, awkward squirt that I wondered how he had ever gotten by the 64. However, what he lacked in good looks he more than made up in brains and memory, and he learned his procedures so well that I soloed him long before the others.

It was one of those crisp autumn days when we shot those fateful duel landings at the auxiliary field. He managed to make enough fairly good ones to convince me he was ready for solo, so we stopped by the stage-house. I'll never forget seeing the sweat running down his neck when I got out and leaned into the rear cockpit to fasten the safety belt across the seat. I knew he'd probably be too nervous to remember to set the trim so I set it myself and tried to be as casual as possible when I climbed up to talk to him. "OK, now," I told him, "just place your base leg where we've been putting it, remember to hold the nose level to slow her down when you cut the gun, give it throttle if you bounce high and, for *God's sake,* remember to reset the trim if you have to go around."

Well, the kid sat there moistening his lips and looking at me as if he were hearing the most important words since the Sermon on the Mount. I gave him a tap on the back and jumped off to walk over to the bench while he shot me a nervous look. Then he gave her the gun to taxi and dusted me off very nicely.

He took one hell of a long time to check his mags and I recall wondering if he was being unusually careful or just trying to screw up his courage to take off. Finally he did give it the gun (roughly as usual) and I remember cussing at him because it was cross-tee. I sweated him out all around the traffic pattern and, when he turned onto the base leg, I held my breath until he closed the throttle. He set her down *exactly* three-point, something he had rarely done with me, and taxied back to the stage-house with a mile-wide grin that said, "Hell, man, I can fly this thing!"

HE shot two more solo landings which he really greased in, and on the dual ride back home I hadn't had to say a word to him. He was obviously feeling his oats as I could catch scratchy strains of "Off we gooo, inta tha wile blooo yonderr. . ," and I had a funny feeling he would be needing some deflating soon. Surely enough, he began to get a little cocky, his airwork started to go "in the pink," and

I had had to give him a lecture on pilot ability that must have made his ears burn for days. Wonder if he remembers it now?

His instrument flying was never anything to brag about and he had gotten the idea somewhere, certainly not from me, that the only way to fly instruments was to shove the controls around like he was driving a bulldozer. An instrument ride with him was always better than anything you could get on a roller-coaster. How he managed to get by his instrument check is beyond me; maybe he gave the check pilot that special "eager look" he usually reserved when he knew he was in for some healthy correction.

Will I ever forget his formations! He had the damnedest habit of jerking his head around when he should have been watching the lead ship, and he would continually use a lot of aileron to hold his position. I remember very clearly racking him back for that little habit good and proper, but he never calmed down until we had a near-accident.

As I remember, we were up solo formation and he was my number two wing man. I had made a turn to the right and he had failed to hold position. He dove down ahead and under me, then climbed up steeply to the right and above me, and just *hung* there in about a sixty degree bank. Then, zoom, back he came across us just grazing my canopy and scaring me and my number *(Continued on page 64)*

Illustrated by Capt. Raymond Creekmore

Illustrated by James T. Rawls

PREPARE FOR INSPECTION

TIMELY ADVICE FROM THE AIR INSPECTOR

Administrative ☆ ***Tactical*** ☆ ***Technical***

▸ ***Under False Colors:*** Wearing of service ribbons and stars which were not earned makes a soldier a hypocrite. WD Cir. 62, 1944, directs that all commanders will assure themselves that service ribbons and stars are worn only by those individuals authorized to wear them. Authority to wear a particular service ribbon and battle stars will be noted in Service Records of enlisted men, and on Officers and Warrant Officers Qualification Cards (WD, AGO Form No. 66-2).

Requirements pertaining to eligibility to wear the service ribbons and stars are outlined in the circular.

▸ ***Continuing Insurance in Civil Life:*** All military personnel discharged to return to civil life, except those discharged under Sec. VII, AR 615-360, must be furnished information concerning National Service Life Insurance as presented in WD Cir. 336, 1943.

The insured will be clearly informed that discontinuance of allotment for payment of premiums does not cancel the insurance if appropriate action is taken to continue premium payments. The salient provisions of National Service Life Insurance, including the rights and conditions of conversion of term insurance to permanent plans, will be fully explained, and the insured impressed with the advisability of continuing the insurance after return to civil life. Those who believe they will be unable to maintain the full amount will be informed of their right to continue any amount of $1,000 or more, in multiples of $500.

▸ ***Inspecting Life Vests:*** Inspections of crews going on overwater flights reveal that in many cases life vests have not been properly inspected and inspection dates have not been stenciled as outlined in TO 13-1-3. Reference is also made to Pilot's Information File 8-10-1.

Frequently caps on the CO_2 cylinders of life vests are not screwed tightly enough originally or work loose. These caps should be checked often because if a cap is more than half a turn from full tight, the plunger will not puncture the cylinder.

▸ ***Nipping Frostbite in the Bud:*** A report from an overseas theatre reveals that in one week 244 combat crew members became casualties because of frostbite. This is evidence enough of the need for more emphasis on training in prevention and first aid treatment of frostbite—and more emphasis on follow-up to assure that instructions are carried out.

▸ ***Attention: Crew Chiefs:*** Tips from technical inspectors:

Hose clamps on all aircraft should be checked frequently.

Propeller feathering pumps must be bled to insure that they are full of oil after the complete oil system of an engine has been drained and refilled, or whenever a modification has been made of the type that would empty the feathering pumps. In bleeding these pumps, the pump outlet line should be disconnected and the feathering buttons depressed until oil is flowing through the pumps. If this is not done, the pump may be blocked by air, preventing oil from entering the pump mechanism and thereby completely stopping the feathering action.

Careless maintenance has resulted in engine rocker box leaks. Nuts securing some caps were only finger tight. Some gaskets were found torn, creased double or missing entirely. Other cases of leakage were traced to warping of the cap itself, as a result of excessive and uneven torquing of the securing nuts.

▸ ***Correct APO Numbers:*** All postal officers at continental home stations have been directed to exercise the utmost caution to assure that correct APO numbers are placed on WD AGO Forms 204. (AAF Ltr. 80-8, 10 February 1944, Subject: "Incorrectly Addressed Mail.")

▸ ***Utilizing the "Old Swimmin' Hole":*** A little water will go a long way toward preparing AAF personnel for combat duty, as long as there is enough to learn how to do more than "dog paddle." If there is a stream or lake (approved by the surgeon) within short distance from a base, it should be used to the

fullest possible extent for instruction in swimming and rescue work as part of the physical fitness program.

Drew Field, at Tampa, Fla., took advantage of a lake five miles from the field to teach 2,000 men how to swim last summer. The higher the mercury rose, the more popular the training became.

▸ ***Noncommissioned Officers:*** WD Cir. 70, 1944, pays tribute to noncommissioned officers and directs that commanders of all echelons do everything possible to assure that noncommissioned officers are "top-flight" men:

"It has been clearly demonstrated in this war, as in past wars, that noncommissioned officers are the backbone of the Army. Success in combat depends upon the character and qualifications of the noncommissioned officers commanding small units. They must be outstanding leaders with a high sense of duty and a strong will. They must be resourceful and willing to assume responsibility. In order to insure that our noncommissioned officers

are equal to the tasks that lie ahead of them, commanders of all echelons will give their personal attention to improving the quality and prestige of those noncommissioned officers who exercise command responsibilities."

▸ *Decorations and Service Ribbons:* No soldier wants to wear his individual decorations or service ribbons incorrectly, but many apparently haven't consulted regulations or their first sergeant. Here is some information that may help to get those ribbons pinned on correctly:

Individual decorations are worn in the order of precedence shown in Par. 53a (2), AR 600-40, 28 August 1941, as amended by Ch. 24, 5 July 1943, followed by service ribbons in order of the date of the service performed. The decorations and service ribbons are worn on the left breast in order from right to left about 4 inches below the middle point of the top of the shoulder in one or more lines.

Suppose, for instance, a soldier has two individual decorations — Good Conduct Medal and Purple Heart, and two service medals—American Defense (received before going overseas) and Asiatic Theatre. The ribbons for these decorations and service medals would be worn in this order, from right to left:

1. Purple Heart. 2. Good Conduct Medal. 3. American Defense Medal. 4. Asiatic Theatre Medal.

The Purple Heart is first, as it takes precedence over the Good Conduct Medal, and the American Defense Medal precedes the Asiatic Theatre Medal since it was earned before the latter.

▸ *Ground Work on Formation Flying:* The Air Inspector of an air force notes that "still more emphasis should be placed on ground instruction on formation flying. Pilots are still being found who don't know formation signals, how to change positions in a formation, the different technique in the arc of turn, the use of throttles, etc."

▸ *Navigational Failures:* Here are some common causes of navigational failures:

Lack of preparation before flight, bad briefing and failure to check equipment for serviceability.

Failure to "steady" the aircraft when using the sextant, taking drifts or loop bearings.

Pilot flying courses other than those given him by the navigator.

Applying wrong drifts.

Relying on mental calculations rather than comprehensive log keeping.

"Wishful thinking" in identification of pin-points.

▸ *Radio Operators' Don'ts:* Here are some "don'ts" called to the attention of radio operators by the Air Inspector of the Second Air Force:

Don't forget to check your radio before you take off.

Don't forget what frequency the squadron is on.

Don't forget your authentication.

Don't forget how to use your frequency meter.

Don't forget the call signs of the squadron and the home station.

Don't abuse your radio equipment.

Don't forget how to tune your radio. ☆

HERE ARE THE ANSWERS

Q. *What arm or service is indicated in the legend following the official signature of a warrant officer on duty with the Army Air Forces?*

A. When signing official correspondence and other official documents and records, warrant officers, regardless of the organization with which serving and whether appointed in the Regular Army or the Army of the United States, will indicate "USA" in the legend after their signature. Exceptions are made for warrant officer band leaders and warrant officers appointed in the Army Mine Planter Service. (AR 340-15, as amended by Ch. 12, 12 August 1943.)

☆

Q. *May enlisted men of the first three grades receive monetary allowances in lieu of quarters for dependents under the act of 26 October 1943, effective 1 November 1943?*

A. An enlisted man who, on 1 November 1943, was receiving or was entitled to receive monetary allowances in lieu of quarters for dependents and had applied therefor, has the option of receiving or continuing to receive such monetary allowances, or, in lieu thereof, may elect to have his dependents become entitled to receive family allowances. For example, a staff sergeant with a wife and one child was receiving monetary allowances of approximately $37.50 a month on 1 November 1943. He may drop these allowances in favor of the family allowances, which would mean that his family would receive $80 a month, of which $22 would be deducted from his base pay. Under no circumstances, is he entitled to both allowances. (Par. 1d, AR 35-4520, as amended by Ch. 5, 21 January 1944.)

Q. *May improperly fitting clothes be altered without charge to the enlisted man?*

A. When a proper fit cannot be obtained from stock sizes, uniforms may be altered at government expense at the time of initial issue or when necessitated by change in the enlisted man's measurements, provided due regard is taken of the cost of the necessary alterations as compared with the regulation price of the uniform. Alterations which will result in a material change from the cut or measurements prescribed for it will not be made in any article of the uniform. (Par. 9b, AR 615-40, 24 April 1943.)

Q. *May time served as an enlisted man prior to entrance upon active duty as an officer be considered in computing the accrued or accumulated leave credit of an officer?*

A. No. (Opinion of The Judge Advocate General, Bulletin of The Judge Advocate General of the Army, November 1943, p. 443.)

Q. *Is a WAC officer who entered upon active duty on 1 September 1943 entitled to the credits of ordinary leave which accrued but of which she did not avail herself during her service as an officer in the WAAC?*

A. Yes, provided her transition for membership in the WAAC to the WAC was accomplished without there having been any interruption in her service. (Sec. IX, WD Cir. 24, 1944.)

☆

Q. *Should the entry on the cover of the Service Record regarding arm or service (Par. 2c, Sec. II, WD Cir. 287, 1943) be made at the time of induction, and should it be changed as changes occur?*

A. The Adjutant General advises that line 3 of the cover of the service record (arm or service from which enlisted or inducted) should not be filled in at the time of induction in cases of men who are inducted into the Army of the United States *without regard to arm or service.* The entry should be made when the enlisted man received his first assignment to a specific arm or service. Only *one entry* as to arm or service should be shown on the cover of the Service Record. Future assignments should be shown on Page 5 thereof.

☆

Q. *May officers receive mileage payments in connection with temporary duty?*

A. Payment of a flat per diem is the only authorized method of reimbursing officers for subsistence expenses incurred in connection with temporary duty travel (in the continental United States) directed in orders issued on and after 1 March 1944. (WD Cir. 60, 1944.)

CORNERSTONE FOR CBI OFFENSIVES

By Capt. Robert V. Guelich

Air Force Overseas Staff

Without the Liberator in the background, this scene might well have come out of Biblical antiquity. Runways are built entirely by native labor with Indian methods and tools, under American supervision.

ONLY landmarks of habitation on the prairie land were a dairy stable, open wells operated by oxen, and some native mud and bamboo huts. Crumbling mosques and temples of an ancient civilization dotted the barren countryside. The weather was hot and dry when a heavy dust storm swirled in to blanket a small group of khaki-clad Americans who were struggling to pitch their tents. Then the rains came, pouring down through the dust-laden air to become a deluge of mud. It was the beginning of the monsoons.

Knee-deep in mud and water, this bedraggled group of AAF ground men cursed the foul weather, cursed the lonesome land and began to set up their camp—a camp that was to grow into the first American supply and repair depot in central India. At the end of the line for communications and supplies, halfway round the world, this first depot group in India not only started its task with woefully inadequate personnel and equipment, but also in the midst of the worst terrain of the entire world — deserts, jungles and the world's highest mountains—and the monsoon rains had started.

Despite their inauspicious arrival, the men of this depot group were to change the course of the war in southeastern Asia—not because of their strength and equipment, for they had no AAF supplies and only a part of their organizational equipment, but because of their spirits to accomplish the impossible.

The task assigned to the AAF was to keep a supply line open in China and to build enough air power to stop and turn back the Jap in his march toward India. However, until supply and service depots were set up our airplanes could not operate. So the initial task was thrown into the lap of the Air Service Command and this one depot group (one of the first ever activated) was to lay the cornerstone for future aerial offensives by the AAF.

WHEN the depot group arrived in central India in June of 1942, the few B-17s evacuated from Java to Asia already were in need of repair parts; P-40s flying combat missions under General Chennault were short of supplies; only efficient transportation routes were the air cargo routes being flown by some overworked C-47s. The air strength was small, but the task was huge, for there were no parts, no supplies, no tools.

Col. John L. M. desIslets, who had accompanied Brig. Gen. Elmer Adler on the initial AAF survey of India and who had laid out plans for the new depot installation as an airdrome construction engineer, took over as commanding officer of the half-drowned depot group. "Colonel John," a civil engineer between two Army careers, wasted no time. The camp went on a work schedule of eighteen hours a day as stables were converted into headquarters, a nearby British barrack was fixed up as the first warehouse, and new barracks were constructed as living quarters. These barracks were turned into warehouses when supplies from the first convoy began to arrive.

Docking the first ship was an event of such great importance to operation of the small air force in India that a special delegation of officers was dispatched to the port to expedite classification and distribution of the cargo. Very little of this cargo ever reached the new depot

for, according to Lieut. Col. Stanley Markell, who was at the port, "All we had at the depot were obligations and no property; when the ship docked, we had commitments for almost every single item."

From boat to cargo plane went the equipment most urgently needed by combat squadrons; railway wagons carried the rest. With the unloading of other ships, supplies poured into the depot as fast as the monsoon rains, overwhelming the men and flooding all of their facilities, but being overwhelmed was SOP in those days.

Drainage ditches constantly had to be dug and rechanneled to keep a field of unsheltered engines from going under water. Tent life was complicated by frogs, grasshoppers and monkeys that wanted to share the men's quarters. P-38 flies, the hit and run type, worked on a 24-hour schedule. The air was so humid you could ring water out of it; the saturated atmosphere rusted typewriters and the intense heat swelled and melted the rubber platens.

Planks over flooded drainage ditches were moved during the night by practical jokesters whose sense of humor couldn't be drowned. Men on night latrine duty were the victims who fell in.

Stamps, a few cigarettes, Indian soap (you had to scrub three days to work up a lather) and Indian matches (if one lights you throw the rest of the box away) were the only attractions in the PX during those early days of breaking ground for the AAF.

"Colonel John" always was around when the going got tough, whether it was three in the afternoon or three in the morning. He knew his men by their first names and he knew the jobs they were doing; he assumed full responsibility for all operations of the depot and all actions of his personnel. He was tireless, a dynamic individual who was quick to appraise and solve problems, and his men constantly were accomplishing the impossible for the "old man."

Groundwork laid by this ASC depot group in India has been turned into offensive striking power against the Japs.

One of our original depot planners in India, Col. John L. N. des Islets—"Colonel John" to AAF depot personnel in CBI—is shown checking supplies moving out from in-transit shelters.

Camp construction continued through the entire monsoon season while the men attempted to keep their tents from floating away. By autumn, the camp was firmly anchored; the first control depot for all AAF planes in the CBI theatre was in operation. But the problem of keeping airplanes flying was another near-impossible task.

Requisitions flowed in and there were no supplies. When some supplies were received, they had to be stored in the open fields since warehouses weren't completed. Airplanes had to fly combat missions when there were no tools available for maintenance and repair.

To help solve the problem of too few men for the simultaneous job of constructing and operating the new depot, Indian coolie labor was employed; dhobies and tonga whales were taught strange mechanical jobs, as non-coms were made shop and project supervisors with hundreds of native workers under them. Despite language difficulties, the men accomplished miracles in getting work out of the natives although their frequent religious holidays, their primitive methods of doing all work by hand and their strict disinterest in hurrying were exasperating. If a big box had to be moved, the natives wouldn't try to budge it for size meant weight to them. If a little box had to be moved, regardless of weight, they would struggle to get it on their heads. Some of the better educated Indians proved to be very able and later were assigned jobs as foremen over other Indian workers, thereby freeing non-coms for other jobs requiring technical skill and training.

Still, without shop equipment and tools, the depot would not have been able to repair and overhaul engines and airplane accessories had it not been for the Yankee ingenuity of our GIs. Without benefit of blueprints or models, they designed and built the functional equipment needed such as engine cradles, moveable hoists, flow-benches, parts racks for engines and an almost endless list of other shop equipment. Home-made hydraulic and electrical test devices for accessory equipment and instruments replaced the equipment that never reached

Scrap metal is collected at the AAF service depot in India where it is sorted by native workers under supervision of Army personnel. Some plane parts are reclaimed, other metal returned to U. S. steel mills.

Coolie-driven white oxen draw water from a forty-foot well in central India. The water is hauled to the surface by pulley in a goatskin bag. GIs never tire of watching Indians work with their primitive methods.

Taunted, praised, petted and insulted, this six-month-old burro walks with indifferent poise as pleas for attention are heaped upon him by two line mechanics at an AAF air depot somewhere in India. The little burro is carefree now, but when he grows up in another six months he will carry loads of earth and stone upon his back that weigh more than he does. The AF knows his worth.

the depot group. By October, 1942, a production-line overhaul system for engines had started operations and a second one had been set up at another base in southern India.

Sgt. Edward Dillon set up a crude foundry shop in which he began to cast airplane parts of brass, aluminum, zinc and babbit. Some of his cast products included housing terminals, sway braces for fighter bomb racks, worm and ring gears, even pistons. Right hand man in this work was Sgt. Frank Bilek, eighteen years a pattern maker. He turned out the wood patterns for the foundry shop, using old shipping crates for his wood supply.

Transportation delays, notoriously common in India because of the five different railway gauges, further complicated depot supply and shipping problems. These were overcome partially by assignment of depot soldiers to ride the rails as escorts on all shipments. These men saw that American equipment was not sidetracked or lost en route to its destination. To get his shipment of oxygen cylinders through, one escort held up a train for a full day until the train crew finally acceded to his wishes and put the cars of AAF materiel back on the train after they had been dropped on a siding for no apparent reason. Escorts rode river barges to keep the natives, who like to chat with friends at every river wharf, on the move. Other expediters practically lived on the docks to prevent new shipments of aircraft parts from getting buried under cargo less urgently needed.

Other men from the depot group were detached as cadres for the establishment of new service centers near advance bases of combat squadrons. Despite the necessity for sending its own personnel out as expediters and as training detachments, the nucleus of the depot group continued to expand its installation and turned out more and more reconditioned equipment.

More airplanes began to arrive in the theatre as rapidly as repair and maintenance facilities were expanded. The cornerstone had been laid; the 10th and what is now the 14th Air Force were able to increase the tempo of their operational flying, striking the Jap supply and communications centers more and more frequently and effectively.

By the spring of 1943 another depot was needed, and needed in a hurry, to help swing the battle pendulum from the defensive to the offensive. To build the new depot, Brig. Gen. Robert C. Oliver, air service commander for the entire CBI theatre, called upon the men who had converted an empty prairie into a huge operating supply and repair base in less than a year. Though scattered all over the theatre, many officers and enlisted men were called back to tackle the new assignment—an assignment that had a six-month deadline.

There was no chance to rest for these men who had started the ball rolling for American Air Force operations in southeastern Asia. There was to be no chance for "Colonel John" to settle down behind a desk, for the colonel was assigned the task of setting up the new depot and he had to start from scratch again.

A private golf course was to be the site for the prospective depot. Empty jute storage buildings were utilized for AAF supply warehousing and for the engineering shops. Before living quarters could be erected, the monsoons struck again and history repeated itself as construction was carried on in mud and water.

Just after the "old man's" headquarters had gone under water during one heavy monsoon deluge the message center received a request from theatre headquarters to expedite deliveries. "Colonel John" replied in proper military language but tacked on a request of his own: "Send me a swamp glider so I can get into my headquarters." A short time later the swamp glider arrived. Now it is being used as a personnel ferry between the main depot and its subsidiary storage buildings on the opposite side of a nearby river.

WHEN supplies arrived so fast they could not be stored in permanent warehouses, 300,000 square feet of land was covered with bamboo and tarpaulin shelters in less than three weeks. The area now is used for in-transit supplies, which total about fifty percent of all supplies handled by this depot. These in-transit supplies are unloaded into the temporary shelters and recorded only according to the project number of the entire shipment. As soon as transportation is available to the proper destination, these supplies are reloaded and shipped without ever appearing on any itemized stock records and with a minimum of rehandling. Warehouse supplies of repair parts, clothing and accessory equipment are placed in general classification sheds on the river bank as they are unloaded from river barges. Then they are picked up on itemized records and placed in warehouse bins as a reserve stock for future requisitions.

With warehouse space scattered over a ten-mile radius, the depot faced additional problems in the receiving and dispatching of its supplies. Almost before the new depot personnel had gotten their feet thoroughly soaked, eighty railway wagons and thirty river barges arrived with AAF supplies—supplies that had to be broken down by items and classified for storage and future shipment. It was a night and day job for every man attached to the depot to get the equipment under cover and depot construction continued while it was being accomplished.

Under Maj. Clarence B. Dayton, engineering officer who had accompanied General Adler to the theatre as a technical sergeant, the engine overhaul shops were set up during the summer and started rolling out engines in October. Seventy-five percent of the personnel in the shops were Indians who were trained on the job by enlisted men.

At the end of the six months allowed for set-up and operation of the depot, it had surpassed its parent depot in size and volume of material handled. The job was done and with its completion Colonel desIslets, the driving force that rushed India's two largest depots to completion in less than sixteen months, was returned to the States to tackle a new assignment.

AFTER two years of skimping and scraping to keep the planes flying, our Air Force in India now is being maintained full strength through the efforts of ASC personnel who built the depots necessary to do the job well.

Transportation of supplies and equipment to the 14th Air Force in China still remains one of the most serious problems to be solved. However, even the 14th has been able to build to greater strength and fly more operational missions because of the groundwork laid by this one depot group, despite equipment shortages, personnel shortages, supply shortages, unreliable transportation and a constant battle with dust, heat and tropical storms. ☆

One of the oldest castes in ancient India, the sweepers go about their task of cleaning the runways of debris. Unhurried, custom-bound Indian people cling with stubborn faith to the past as modern war weapons move around them. The C-47s and the sweepers are symbols of time in India.

FLYING SAFETY

Suggestions from the Office of Flying Safety, Headquarters, Army Air Forces, in the interest of accident reduction.

These items are for educational purposes and are not to be construed as directives.

Safety Advice from Combat Vets

The following consensus is based on the ideas and observations of four bomber pilots who have recently been assigned to the Office of Flying Safety after tours of duty in the North African and Mediterranean theatres. They are Maj. Roscoe H. Johnson, CO of a B-17 squadron, and Maj. Kenneth W. Schultz, squadron CO, Capt. Edmund Harris and Capt. Robert N. Wesley, who flew B-26s. Each of these officers has had from 40 to 52 combat missions.

Parachutes: One combat mission is sufficient to dispel any notion that a chute is a useless appendage. The parachute, despite its nuisance qualities, overnight becomes man's best friend. The wise pilot, who as the commander is the last man to leave a ship, develops a lot of interest in the equipment.

Where a squadron lacks a personal equipment officer, an officer should be appointed to supervise the fitting and care of chutes. Combat exacts a toll for any guesswork.

Newly found "chute consciousness" is no substitute for a backlog of training in the care and handling of the equipment. A trained man has the confidence and surety that may make all the difference in a tense situation.

"In a theatre," Captain Wesley advises "a pilot should make certain that his crew wear, or have right at hand, chutes at all times. Returning from a mission, my gunners formed the habit of leaving their chutes behind when they went forward to the navigator's compartment to keep warm. I stopped it with these words, 'As last man out, I don't want to have to wait around while you're scrambling around hunting chutes.' "

Major Johnson's belly turret gunner took his chute, a roll-type chest pack, with him into the ball of the B-17. Other gunners in the theatre used the same trick.

"The pack took up some room," Major Johnson says, "but my gunner, who was about the average size for a belly turret man, found space for it. The deal gave him the best bail-out position in the ship. All he had to do was snap on the chute, open the escape door and fall out."

Ditching: In the Mediterranean theatre, experience has shown that B-17s and B-26s generally will float long enough for everybody to get clear, but there's no time for dilly-dallying. Inspired by furnishing cover for planes forced down, crews performed ditching drills by assuming stations and abandoning plane during normal landings.

These drills were made as realistic as possible, with crewmen having emergency equipment at hand, bracing themselves and, after the plane rolled to a stop, scrambling out through emergency hatches. The few minutes required to put the plane back in shape were considered well spent.

It's a good idea, according to Captain Harris, to attach emergency equipment to the person when possible to make certain it will be at hand when the crew gathers in the life raft.

In the Mediterranean, as elsewhere, a pilot at times has difficulty judging his height above the water when letting down. Two aids found useful in this

connection were creating a splash by firing the forward guns, and observing the shadow cast by the plane when the sun was right.

Emergency Equipment: A life raft ceases to be excess baggage and assumes considerable importance to a thoughtful man making overwater combat flights. Major Johnson devoted a lot of care to his raft and, as a result, it never fell out in flight as in the case on other B-17s.

He made certain that the raft was completely deflated (to prevent the raft from expanding at high altitudes), kept foreign objects from the compartment and safetied the release handle with light wire as insurance against vibration. The raft also was checked for bullet or flak holes upon the return from any mission in which the plane had been under fire.

"In a combat theatre," Major Johnson explains, "if you're careless or unlucky enough to lose your raft you may find you'll have to do without one for lack of a replacement."

Crash Landings: As in ditching, it's important in crash landings to get away from the plane in a hurry. Crews need no urging on this; as one officer remarked: "The men spill out like Keystone Comedy cops leaving a patrol wagon."

But this apparently spontaneous speed often is the reward for emergency drill. Captain Wesley says that it's important for a pilot, preoccupied with an emergency landing, to be free of worry about whether his crew has assumed proper stations.

"With your own crew you can get procedures down pat," he observes, "but in North Africa there was a lot of shifting of personnel. When this happens a pilot should instruct newcomers on emergencies before taking off. His own peace of mind may be at stake later on."

Captain Wesley, who witnessed a number of belly landings, notes most pilots had a tendency to overshoot when coming into the field.

"Naturally the average pilot is not used to making a wheels-up landing," he says, "so unless he bears in mind that when in this condition his plane will glide farther than in a normal approach he risks not being able to get down in time."

Crewmen in Captain Harris' group helped cushion themselves for a crash landing by inflating the Mae West. The plan wasn't used for ditching because of the danger of a puncture and an inflated vest might impede the exit from a plane filling with water.

Oxygen: Major Johnson's crew had no difficulty with high altitude missions—a dividend for rigid oxygen discipline.

When the navigator reported 10,000 feet altitude, masks were donned, with each man confirming by interphone. Between 10,000 and 20,000 feet, the roll was called each half hour, and at higher altitudes, every five or ten minutes.

Because of their isolation, the belly and tail gunners received special attention, but any station failing to report was visited immediately by a crewman equipped with a walk-around bottle.

Major Johnson's crew practiced with the walk-around bottle to discover its time limitations. Here, too, guesswork can cause trouble. The length of time a bottle may be used varies with the pressure of the oxygen system at the time it was filled, the altitude and the lung capacity of the wearer.

"An incident on one of our flights really made us oxygen conscious," Major Johnson says. "It verified those training films that show a man being overcome by anoxia without knowing it. On this

flight, my co-pilot's oxygen hose connection became uncoupled. He got a silly, dreamy look in his eyes. I thought he was clowning until he suddenly toppled from his seat. The engineer coupled the hose again, and the co-pilot came to in a couple of minutes. He never could be convinced that he had actually passed out."

General Observations: Crew members, including pilots, wore GI steel helmets when in combat in the Mediterranean theatre. The pilot usually donned his tin hat when approaching flak areas.

Major Johnson's group solved the problem of fitting a radio headset under the helmet by inserting the receivers in a cloth headpiece and eliminating the frame.

Eternal vigilance is required overseas to protect jungle kits and other emergency packs. Handy items such as guns, machetes and the like have a way of disappearing when planes are serviced.

"Your best protection," Major Johnson says, "is to keep an eye on your stuff and see that your crew does likewise, especially at a strange field." ☆

FLIGHT CONTROL ADVICE

One Pilot Accepted It . . . Cleared from Phoenix, Ariz., 500 feet on top of the clouds via the Green Airway to El Paso, Texas, the pilot of an AT-11 became unsure of his exact location as he approached his destination.

Weather at El Paso showed an overcast at 2,000 feet, with light rain. Under these conditions the lost pilot faced trouble, for within 32 miles of the field there are mountains as high as 9,100 feet.

When the pilot announced he intended to descend through the overcast, Army Flight Control advised him to proceed to Salt Flat, where conditions were CAVU. The pilot accepted the advice and made an uneventful landing.

Meanwhile, Army Flight Control had made arrangements with a Federal Communications Commission Radio Direction Finding Station to direct the pilot in case he was unable to locate the Salt Flat Field.

Another Didn't . . . A flight leader's failure to accept the advice of Army Flight Control recently cost the AAF a B-25. The plane was an element of a three-ship flight which cleared contact from Lexington, S. C., to Chanute Field, Ill.

While over Cincinnati, the flight leader advised the destination was changed to Baer Field, Fort Wayne, Ind., Instrument Flight Plan, with a request the flight be assigned air space 500 feet above all clouds. The Cincinnati Flight Control Center informed the flight that Baer Field was closed, adding that Chanute had unlimited ceiling and good visibility. The flight leader chose to go to Baer Field anyway.

The Chicago center advised the flight that South Bend had a 4,000 feet ceiling, with unrestricted visibility, but the flight leader decided to *(Continued on next page)*

P. & I. SAYS:

(The Prevention and Investigation Division, OFS, is composed of veteran flyers. These reports include comments by these veterans on recent accidents. Read and heed.)

MITCHEL FIELD, N. Y. — A P-47 pilot was killed and his plane demolished when he made a violent bank, with insufficient airspeed and altitude, in an effort to line up with the runway after overshooting during his turn into the approach. The plane stalled and spun in.

P & I COMMENT: This is another tragedy resulting from a pilot's failure to have firmly in mind a determination to go around in case of overshooting. This pilot had only a split second to decide what to do and, lacking a fixed idea to go around in such cases, he impulsively tried to get down regardless. As The Command Pilot, official accident analyst of the 1st Fighter Command, remarked: "No pilot has ever been condemned for going around."

BALTIMORE, Md. — A BT-9 nosed over, damaging the propeller, when the pilot ran up the engine for check before take-off.

P & I COMMENT: Investigation showed this plane was facing 180 degrees, although a gusty 22 MPH wind was blowing from 320 degrees. In other words, the pilot was asking for just what happened. When engines are being run up for a ground check, it's good practice always to point the airplane less than ninety degrees from the direction of the wind.

KINGMAN, Ariz.— Pilot made a normal landing with a P-38 except that his gear was up. Upon entering the downwind leg he had placed the landing gear switch in down position but did not check the landing gear warning lights.

P & I COMMENT: Upon investigation of the aircraft it was found that the down relay was inoperative, making the electrical extension of the gear impossible. Since the pilot did not check his warning lights he did not know the gear was up and made no attempt to crank it down. Two seconds of care were all that was required.

COLORADO SPRINGS, Colo. — Preparing to take off in a B-17, the pilot disregarded his check list and began to start the engines. The pilot and co-pilot devoted all of their attention to the engines and the plane began to roll forward. This was not observed until too late and the ship crashed into a gas truck before the brakes could be applied. One propeller and the nose section was damaged.

P & I COMMENT: First mistake this pilot made is obvious. He did not use his check list. If he had his brakes would have been set and the accident would not have happened. Occasionally brakes fail to hold so wheel chocks should be used in accordance with AAF regulations.

BLANCHARD, Okla.— A pilot flying a PT-19 low in violation of regulations struck a high-line. The ship was thrown out of control and crashed, killing the pilot. His previous flying record was perfect.

P & I COMMENT: The pilot's previous record might have been a mitigating factor if he had lived to report before an investigating board. But it was of no help to him dead.

(Continued from Preceding Page)

make an instrument let-down at Baer Field. The flight leader made it all right, but one plane overshot and received major damage, while the third missed the approach and luckily got down on the Fort Wayne municipal field.

Two other Army planes, headed for Baer Field at the time, acted on Army Flight Control advice and had no difficulty making safe landings at South Bend and Cincinnati.

Become Gasoline Conscious

Investigation discloses that many new pilots and aerial engineers are extremely deficient in knowledge of the gasoline consumption of an airplane at the various power settings used during a mission.

In an effort to make new flyers "gasoline conscious," a regional safety officer recently devised a fuel consumption chart which was used with good results by two heavy bombardment groups of the 2nd Air Force.

The chart, which is kept in flight by the co-pilot, is a running log of power settings, time used, gasoline consumption for that setting and the amount of gas remaining in the tanks. Data on consumption is supplied on the log for the co-pilot's information. In addition to keeping track of gasoline consumption and educating personnel in the subject, the log will uncover ships that are gasoline hogs, pilots who abuse the engines, and whether proper manifold pressure and RPM are being employed.

Sample copies of the log, which was devised for B-24 aircraft, will be sent to any AAF personnel interested in the problem of gas consumption. Write Headquarters AAF, Office of Flying Safety, Safety Education Division, Winston-Salem, N. C.

Note to Pilots

Revisions of the Pilots' Information File are now issued on a regular monthly basis and should be in the hands of the operations officer for distribution by the first of each month.

The revisions are numbered consecutively, that is, April 1 revisions are No. 8, May 1, No. 9, and so on. To insure that the file is kept up to date, it is suggested that a note be made on the inside of the cover when new sheets are inserted.

Lieut. Col. Henry F. Carlton, PIF chief, issues the following call to all flyers: If you disagree with any item send in your criticism, likewise send in any suggestions for added material. It isn't necessary to go through channels. Communications may be sent directly to Hq AAF, Office of Flying Safety, PIF Unit, Buhl Building, Detroit 26, Mich. ☆

What's Your AIR FORCE I. Q.?

After leaving you at the mercy of your own conscience and mathematics for a scoring system last month, we come back with the customary yardstick for a tough 20-rounder. A score of 90 or above is a whiz; 80 to 90, definitely on the beam; 65 to 80, not too bad; below 60, tsk, tsk.

1. The Jap aircraft popularly referred to as a Betty is a
a. Single-engine fighter
b. Four-engine bomber
c. Twin-engine fighter
d. Twin-engine bomber

2. When a photo-reconnaissance pilot "dices" an area, he
a. Shoots crap with the officer in charge
b. Makes a photo strip seven miles wide and eleven miles long
c. Takes pictures from above 30,000 feet
d. Takes pictures from low level

3. Bowman Field is located nearest to
a. Bowmanville, Ark.
b. Louisville, Ky.
c. El Paso, Texas
d. Reno, Nev.

4. What is the difference between absolute altitude and absolute ceiling?

5. The F-5 is a modified version of the
a. P-40
b. P-38
c. P-47
d. P-39

6. Aeroembolism is popularly called
a. Operational fatigue
b. The bends
c. Air sickness
d. Black-out

7. The Messerschmitt M-210 is a
a. Four-engine bomber
b. Twin-engine fighter-bomber
c. Single-engine fighter
d. Four-engine transport plane

8. Presence of the cumulonimbus type cloud usually indicates
a. Clear weather
b. Cloudy conditions but good flying
c. Thunderheads
d. Fog but no rain

9. Which of the following colors are not found on the Distinguished Flying Cross ribbon?
a. Blue
b. Red
c. Purple
d. White

10. To what do the initials SHEAF refer?

11. The commanding general of the 5th Air Force is
a. Maj. Gen. Nathan Twining
b. Lieut. Gen. George C. Kenney
c. Maj. Gen. Howard Davidson
d. Maj. Gen. Willis Hale

12. In nautical miles the distance from Hickam Field, Hawaii to Tarawa is approximately
a. 3,200 miles
b. 1,000 miles
c. 4,800 miles
d. 2,100 miles

13. The Bronze Star is awarded for heroic or meritorious achievement or service, not involving participation in aerial flight.
a. True
b. False

14. If you have completed one year of military service since December 7, 1941, you are automatically entitled to the Good Conduct Medal.
a. True
b. False

15. The Frisian Islands are
a. In the South Pacific
b. Off the coast of India
c. In the Mediterranean
d. Off the coast of Holland

16. An air mile represents the same distance in feet as a mile measured on the ground.
a. True
b. False

17. An officer not holding a flying rating but on flying status receives monthly, in addition to his regular pay
a. $100
b. $20
c. $60
d. $40

18. The Lister bag holds fifty gallons of water.
a. True *b. False*

19. On the command "Fall In," it is not necessary to come to attention until the order "Attention" is given.
a. True *b. False*

20. Identify this fighter plane.

Answers on Page 64

ON THE LINE

A MONTHLY MAINTENANCE ROUNDUP PREPARED IN COLLABORATION WITH THE AIR SERVICE COMMAND AND THE TECHNICAL INSPECTION DIVISION, OFFICE OF THE AIR INSPECTOR

Off Again—On Again in New Guinea . . .

A Hollywood script writer, batting his brains out to fill in a thousand feet of incidents having to do with "conquering insurmountable obstacles," could hardly have improved upon the "scenario" that featured an Air Service Command salvage crew in New Guinea some time ago.

Backbreaking, heartbreaking toil, bitter disappointment, tension of probable enemy action—all the elements were in the tale enacted by the ASC men. Although the battle lines have since moved northward appreciably, the guys on the ground will never forget their role of the Papuan campaign.

The crew of five men, Lieut. William C. Wilson, Sgts. Edwin M. Seabolt, Will K. Brown, Robert W. Martin and Edward L. Little, set out to recover the vital parts of a crashed B-25, that they might be used to supplement woefully short stocks and thus put back into combat other planes of the same type which were grounded for lack of critical repair items.

The crashed bomber was eighty miles from the repair base at Port Moresby. It was reached by a voyage in an old 300-ton barge, which had been beached for two months. It was the only vessel available although it was pitifully inadequate for the work.

After arriving at the scene of the wreck, the men put in three days of all-out effort to "beef up" the collapsed nose gear of the plane.

At that point, Lieutenant Wilson was called back to his base and Lieut. Warren E. St. Pierre came in to conduct the rest of the operation.

An Air Service Command ordnance company, pressed into service, improvised and manufactured a light winch with which Lieut. St. Pierre was able to tow the plane through the sand to the vicinity of the barge.

Natives, willing but exasperatingly slow, clumsy, inept and seemingly unable to understand what was wanted, finally secured enough timber for the repair crew to build a fifty-foot ramp from the beach to the high sides of the barge. The salvage crew had only three hours of low tide in which to build the ramp and load the plane aboard. Then, when the plane was only two inches from the top of the ramp—it was being loaded tail first—an eye in one of the snatch blocks gaped open; natives, who had been following the plane up the ramp, chocking the main wheels with safety blocks, became terrified. They dropped the blocks and fled. The bomber shot down the ramp, recollapsed the nose gear and buried its nose in the sand, below water at high tide.

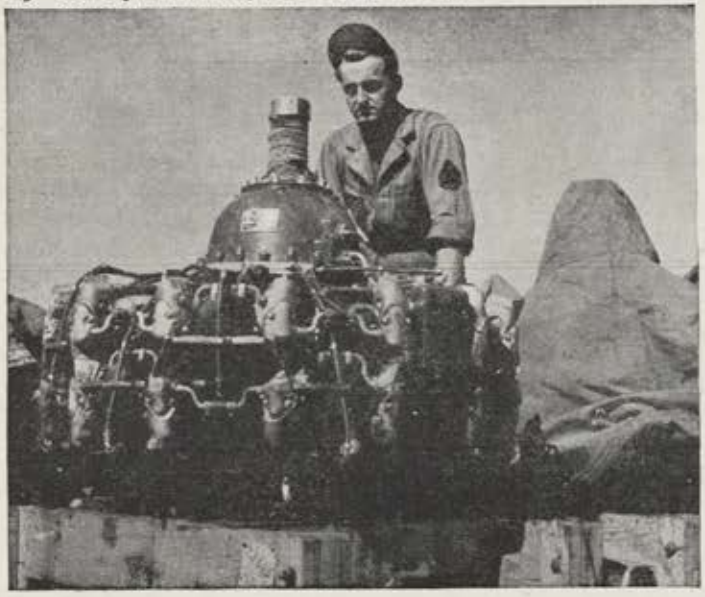
For three days, while gnats and mosquitoes tortured them in plague-like numbers, the crew had to stand by, watching the salt water eat away at the plane, until a tractor could be secured to haul the aircraft to high ground.

Days of added work resulted. The crew was obliged to dismantle the plane as much as possible and flush out its parts with fresh water, dip them and coat them in hot oil and re-pickle the engines, to prevent corrosive action of the salt water.

Finally a lucky break came. A smaller barge, with lower freeboard, was made available. It was explained eventually to the natives what they were to do. With their canoes they towed the barge five miles up a river which angled back to within three-fourths of a mile of the B-25's location. The salvage crew set about cutting a road through the jungle for this distance in order to tow the bomber to the vessel.

And then disaster struck again. A liaison plane, being used to ferry in supplies to a small military unit nearby, cracked up on a take-off and plunged into salt water just off the beach. At this point the salvage crew performed its most remarkable exploit. It succeeded in moving its winch to a point on the beach

Because of the care given by mechs of the CBI Air Service Command, "Old 912" functioned perfectly for 745 hours of continuous operation when, ordinarily, a tear-down would have to be made in half of that time. At the end of this run, during which there had never been a complaint or a stall, the engine went in for an overhaul and reconditioning. Staff Sgt. E. W. Zagriski, Buffalo, N. Y., is shown with "Old 912."



This contrivance is a gift from the Nazis which turned out not quite like the Germans expected. Recovering a 2,000-pound bomb, which the Luftwaffe dropped on a city near their 8th Air Force base in England, Tech. Sgts. Charles W. Dese (left) and James W. Brown converted it into an auxiliary compressed air tank. It is now used in supplying compressed air for electric, paint and metal shops on the airfield.

ON THE LINE

opposite the new wreck, in digging a "deadman" in the beach to which the winch could be anchored, and in towing out the plane to dry land within ten minutes after the crash. The pilot and passenger were uninjured.

By evening of the same day, the crew had dismantled the liaison craft, pickled the engine and flushed the plane thoroughly with fresh water.

Two days later, the road having been cut through the jungle, both planes were towed to the barge and loaded. In a full moon flood tide, it was towed by native canoes to the mouth of the river where a powered boat was waiting to take the barge on its long haul to Moresby. This final trip, incidentally, had to be done entirely by night; a stiff on-shore breeze prevailed during daylight, making navigation through the reefs impossible.

The entire operation, which was staked with only two weeks' emergency rations, took a month to complete. The liaison plane was promptly put back in the air, while every part of the B-25 except its smashed nose section and front landing gear was made a component of some other combat bomber of the same type.

Of this operation, the commanding officer of the Air Service Command group which did the job wrote in part:

"The tireless efforts of this crew, both officers and men, in the face of heartbreaking difficulties and setbacks, of swarms of gnats and mosquitoes, of emergency rations and tinned food, of insufficient and proper equipment, and of the aggravating inability of the natives to understand what was wanted or to be of any real help when they did, are worthy of the highest commendation."

Saving Time in England . . .

Two sergeants at a B-26 station of the 9th Air Force in England, with little—if any—pre-GI mechanical training recently solved the knotty problem of how to save time and to simplify the arduous difficulties rising from their duties as mechanics, when they invented a gadget named the "bushing puller."

The invention, according to its creators, Tech. Sgt. Ellis C. Drummond, Jasper, Ala., and Staff Sgt. Herbert L. Ehlers, Milwaukee, Wis., "reduces a twelve-hour job to about four hours."

Working in the tail assembly of B-26s and confined to the cramped, close quarters, the old method consisted in driving out the bushing with a drift pin and heavy hammer—slow and difficult labor at best.

To facilitate the time involved and lessen the discomfort, the two sergeants worked out their gadget. It is a steel bolt about eight inches long, squared on one end and threaded on the other with a shoulder in the center. By tightening the nut on the threaded end the shoulder automatically pulls the bushing out of the tail, thereby releasing the fin. In addition the new device excludes the chances of binding during a removal or fitting. When a bushing binds it prolongs a routine job into long hours of exhausting labor. "Now," Sergeant Ehlers says, "by using the bushing puller we get steady, direct pull that removes the bushings easily."

Several other mechanics at this medium bomber station under the command of Lieut. Col. Wilson R. Wood, Chico, Texas, have tested the puller and found it highly workable. Sgt. Walter T. Austin, Covington, Ga., also comes in for a share of the credit in developing the device. —Cpl. Samuel Oxman, 9th Air Force.

Staff Sgt. Herbert L. Ehlers (left) and Tech. Sgt. Ellis C. Drummond with the bushing puller labor-saving device they concocted in England.

Send Along Those URs . . .

GI and general alike share in the responsibility of expediting unsatisfactory reports. For its greatest and most effective strength, there can be no weak links in the UR chain. Any individual who shirks his UR responsibility may be the cause of death and destruction when planes in flight fail to function properly. Don't wait! Send in that UR at once, as soon as you spot defective parts or materials.

The facts that equipment is small in size and the functional effects are not judged far-reaching, are *never* reasons to neglect sending URs. Brittle safety wire that should be ductile requires a report via UR; the manufacturing source of such wire must be traced in order to maintain high standards of quality in AAF equipment. The idea that only major troubles rate URs is not true. Don't wait for a disastrous ground loop caused by malfunctioning of a brake hydraulic system to use that red-bordered form.

It is imperative that *all* unsatisfactory conditions, great or small, be reported promptly.

He Generates Generators . . .

At a 5th Air Force Air Service Command base somewhere in Australia, Staff Sgt. Frank C. Dodsworth has fashioned numerous mechanical devices. His specialty, however, has been a high-speed, portable electric power generating plant which he built from discarded washing machine parts, junked automobile motors and whatever else he found at hand.

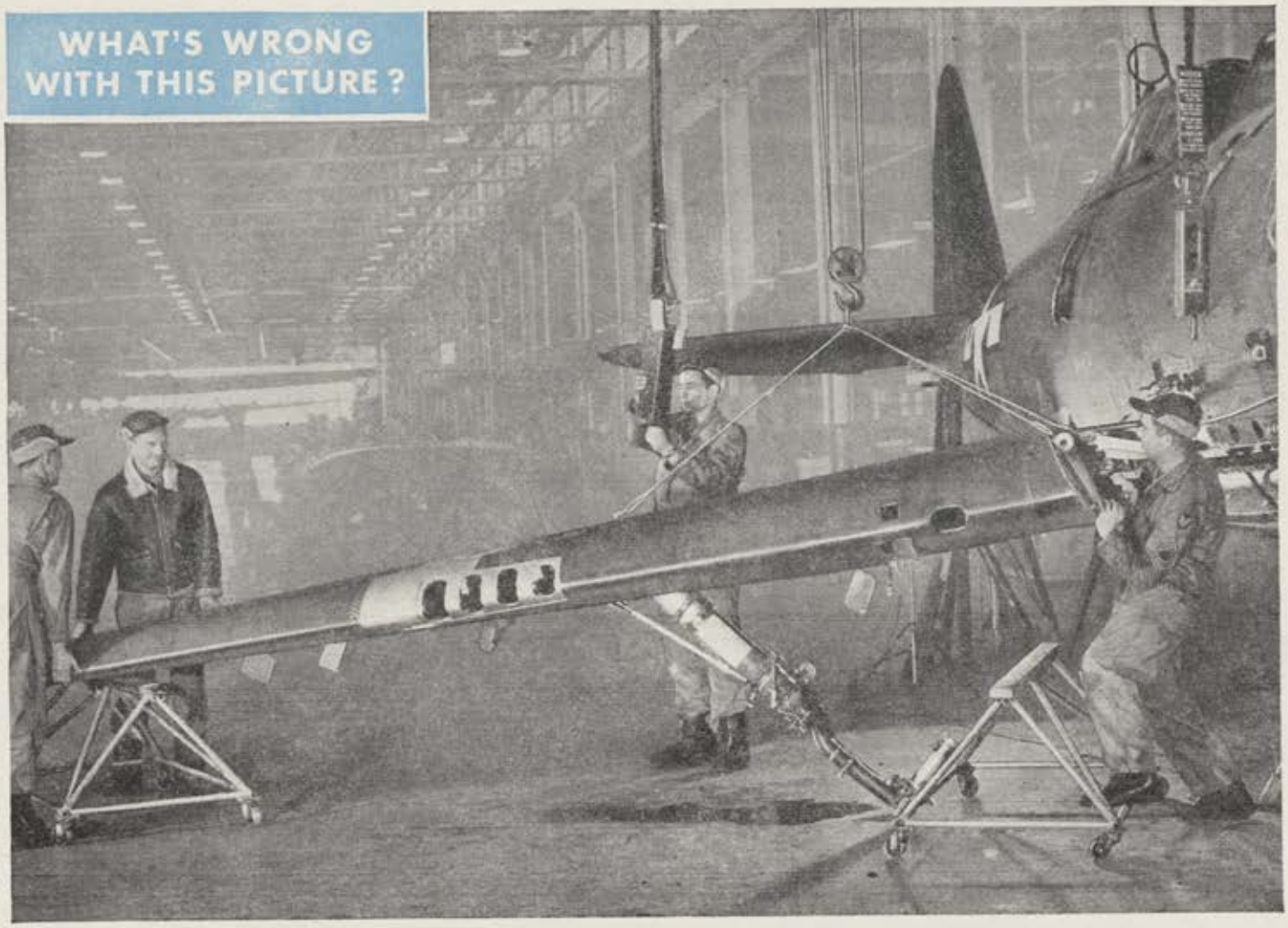
Modeled after an American type of unit capable of generating 110 volts, the plant is small enough to be carried on a two-wheeled trailer and pulled by a jeep. Thus it can be moved through almost any section of the jungle to supply electricity for the operation of power tools used in the repair and salvage of wrecked or grounded Allied aircraft.

No less than 35 of these Dodsworth-built generators have been in service in New Guinea and the Solomons. Through jungle thicknesses, over mountains and along soggy lowlands, they have been hauled to give on-the-spot service to planes, which, because of the nature of the terrain in which they have been forced down, could not be transported back to an established repair base. Scores of fighters and bombers which otherwise would still be lying useless in the jungle wastes are thus put back in action over Jap installations.

Some of the generators have been used to supply electricity for giant searchlights, others generate power for transmitters and still others have been used to supply Allied soldiers with the unheard-of luxury of electric lights in their tents behind the front lines.

Dodsworth has seen little of his handi-

WHAT'S WRONG WITH THIS PICTURE?



SO YOU'RE going to install a P-47 wing? Well, here goes with TO 01-65BC-2. The chief took one look at this set-up and scratched his head in despair—but then, the boners were posed with full knowledge that there is a right and wrong way of doing everything, including a wing installation.

Each month you men are challenged to find the mistakes. There certainly is no secret about the one that fairly jumps off the page—the extended landing gear. The reason you're not asked to name this obvious error is that you're to figure out why the landing gear is down during wing installation, and how it got down. You'll find the answers on Page 64 to seven mistakes. Can you find more?

In the picture (left to right) are Sgt. Glen Manning, Cpl. Eugene Greenwold, Sgt. Robert L. Craig and Staff Sgt. James C. Edsall, all of Headquarters Squadron, Air Service Command, Patterson Field, Ohio.

work in action. Stationed at a base of the 5th Air Force Service Comand far from the combat area, he serves, technically, as unit supervisor and purchaser in a supply unit charged with providing all types of repairs and supplies for Allied planes.

As a purchaser, he buys what few parts are available for his generators, begs, borrows and scrounges many more, and keeps a vigil over junkyards within a thirty-mile radius for the rest. He puts the pieces together, improvising a new part here and adding a necessary improvement there, until the completed generator is in operational order and ready for shipment to the front.

Dodsworth's talents are put to many uses. Shortly after he was assigned to his present base he designed and built the wind-direction indicator which is still in use. At present he is busy assembling a portable workshop to be carried in a bomber. He builds many of the tools for his assemblies himself.

THE STAFF OF LIFE . . .

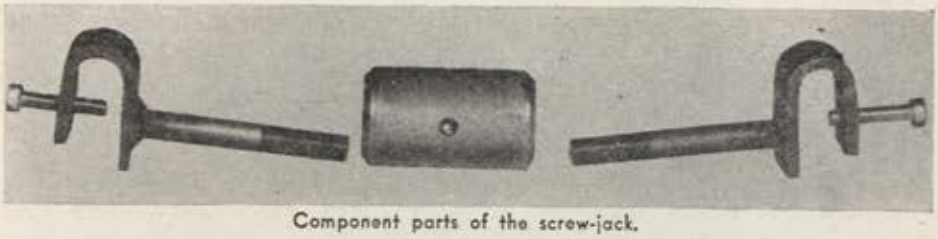
One of the strictly headache jobs being done with a minimum of aspirin these days is that of a Quartermaster outfit in New Guinea which has eight lieutenants and something less than a hundred enlisted men handling supplies for troops in the forward lines of that area.

The outfit is attached to the 5th Air Force Service Command, and it has charge of some 10,000 items which various units in the area need from time to time. The supply dumps are log and thatch frameworks perched in a steaming jungle. Although one time the outfit may be requested to supply an organization with a box of paper clips and the next day a three-quarter ton generator, the main job is *food*, lots of it for 47 different organization messes in the area.

For awhile, one man was detailed to fly back and forth in a "bread plane," lugging in loaves of white, whole wheat and rye. This became tiresome until Lieut. Arthur G. Borchardt volunteered for a course in a baking school. He learned how to make bread and started a bakery in the forward lines, thus relieving the fellow on the bread run.

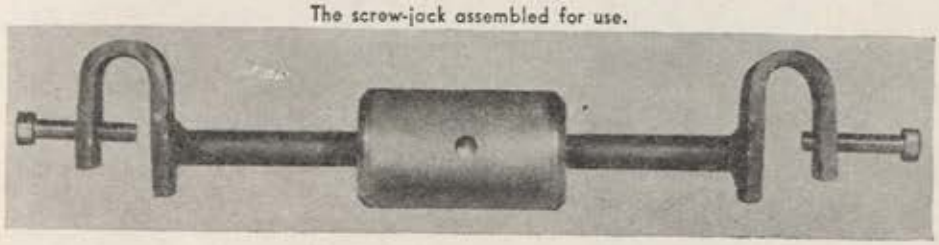
A LITTLE REMINDER

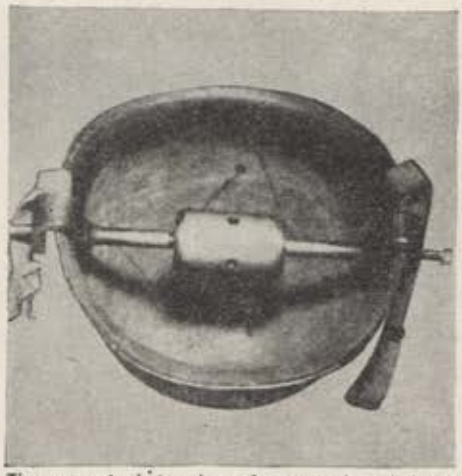
Be certain that threads are showing through self-locking-nuts installed on accessory hold down studs in accessory section. See TO 04-1-13. ☆



Component parts of the screw-jack.

The screw-jack assembled for use.





The screw-jack in place for spreading helmet

COMFORT WITH PROTECTION

By Maj. I. Louis Hoffman

OFFICE OF THE AIR SURGEON, 15TH AIR FORCE

By 'custom-tailoring' the M-1 metal helmet, 15th Air Force bomber crews have maximum protection against flak with minimum discomfort.

SEEKING out the primary causes of head wounds among combat crews, an investigation recently revealed that the M-1 helmet was too often going on raids merely for the ride. One sergeant revealed that he had taken his helmet on 43 missions but had worn it less than ten seconds all told—yet that one donning had saved his life.

After extensive inquiries it was learned that the majority of combat crew personnel have not worn their helmets over their leather flying helmets because of the uncomfortable pressure on the earphones. The steel helmets, being of standard size, do not allow for heads of different sizes and the bulge of the earphones. Aside from the discomfort caused by the ill-fitting combination, the undue pressure also diminished the circulation within the ears and made this a contributory factor to frostbite at low temperatures.

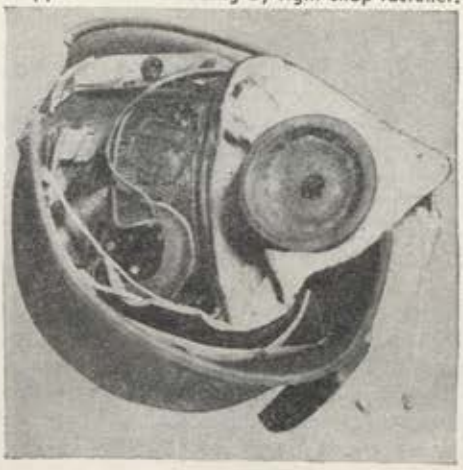
This investigation, conducted within the former 12th Bomber Command, now the 15th Air Force, revealed that some crew members had attempted to wear the steel helmet without the fiber lining and, while this allowed for the bulge of the earphones when worn by personnel with narrow heads, the instability of the unsupported steel helmet made it more of a nuisance and menace than a protective device. In addition, it did not protect against the concussion of a missile striking the helmet, due to the absence of the fiber lining and suspension webbing.

With these facts to work with, investigators soon learned that the incidence of head wounds could be reduced by modifying the M-1 helmet so that it could be worn over the leather cap and earphones with comfort and stability.

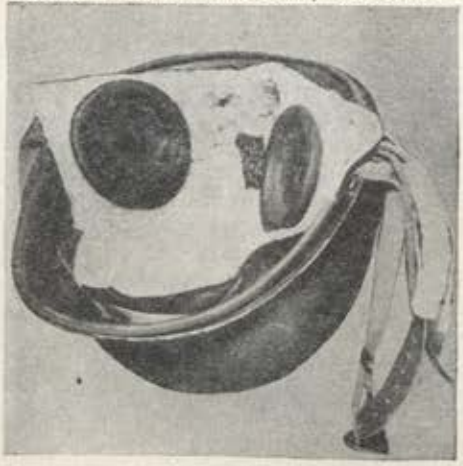
Experiments then showed the feasibility of modifying the present metal helmet so that it (with summer liner) could be

Sections have been cut from the summer liner to accommodate earphones, and female parts of two snap-fasteners have been set in rear webbing. Inner sweat or head-band has been adjusted to receive the leather flying helmet.

Leather helmet and earphones are shown in liner with left male part of snap-fastener set in leather helmet. Left female part of snap-fastener is set in rear webbing. Leather helmet is clipped to rear webbing by right snap-fastener.



Helmet is now ready for use, with the leather helmet inside the summer liner which is clipped to the webbing by two snap-fasteners. It is also clipped to the front sweat band by one snap-fastener for additional stability and comfort.



worn over the leather flying helmet and earphones, without undue discomfort.

The deformation of the helmet is made by devising a screw-jack which will spread the sides at points coincident with the location of the ear-pieces of the headphone. The screw-jack should be left in place for five minutes and the helmet tapped with a mallet to help it set. If this is not done the helmet will revert to its original shape. Under any condition it may be necessary to re-spread the helmet after a few months. The summer liner is left in place and the inner sweat or heat band is unsnapped at the sides and rear. The steel helmet should be supported evenly by the webbing, thus giving protection against the direct transmission of an impact to the skull.

The inner webbing should be adjusted to allow the helmet assembly to cover as much of the wearer's head as possible, yet rest on the webbing to absorb shock. If the helmet lacks stability fore and aft, with relation to the leather helmet, three snap fasteners may be installed in such a manner as to clip the rear webbing (permanently attached to the summer liner) to the leather helmet at two points as widely spaced laterally as the webbing will permit.

It is important that precise care be taken by the individual in adjusting the sweat band, helmet assembly, width of spread and location of the snaps (if found necessary) in order to get the maximum protection and comfort from the helmet.

Those assemblies which have been properly modified have caused no discomfort to the wearers other than the extra weight added to the normal fatigue resulting from wearing the standard leather helmet with headphones — the added protection far offsetting the discomfort involved.

Considerable variation in the described modification can be made by the individual in attaining the maximum comfort and utility. In one method, shown in the accompanying pictures, the summer liner may be cut out immediately around the earphones, or the leather helmet may have the rubber ear cups installed directly in the leather helmet by cutting the proper hole and inserting the earcup from the inside and sewing it in place.

The sergeant who owes his life to the one time in 43 missions that he donned his helmet is Staff Sgt. Charles W. Wilds, tail gunner in one of the bombers raiding an airfield near Rome on January 19. When the formation encountered heavy flak, Sergeant Wilds put on his helmet in response to a warning from his pilot. Although he had carried it on all missions, this was the first time he actually donned his helmet. He no sooner had done so than a burst of flak penetrated his right side window and blew the helmet off his head. He received multiple slight lacerations on the back of his neck from flying plexiglass. His helmet showed three distinct deep dents in the right posterior quadrant. One large fragment of flak was found on the floor.

It is felt certain that the steel helmet in this instance saved Sergeant Wilds from a penetrating wound of the head that presumably would have been fatal.

The helmet is on display on the bulletin board to stimulate its use by others. ☆

China's Invincible Airdromes

By Maj. Lyman B. Lockwood
14TH AIR FORCE

Coolies and rocks are main factors in repair of China airfields.

AFTER an airdrome is placed in full operation in China it is a physical impossibility for the Japanese to bomb it out of commission for more than twelve hours. In December, for example, an unusually accurate force of Japs dumped ten 500-pound bombs and one 1,000-pounder in the contact section of our main runway and made other hits on taxiways, hardstands and dirt areas within the field limits. Runway light lines were cut in 51 places, markers were destroyed, the radio was knocked out and ground communications were severed.

Despite this extensive pounding we were able to guide our returning fighters and bombers (they had been bombing the Nip raiders' home airdrome) to safe landings on undamaged sections of the field. After seven hours of reconstruction our field was in first class operating condition and traffic was handled throughout the night. Before the Japs can knock out our airdromes they must first blast all the rocks and all the coolies in China.

The Chinese military authorities provide us with coolie labor, supplemented by their soldiers in emergencies, and the supply of rocks is as unlimited as China's strong backs and nimble hands. We have no airport machinery to be damaged, no scrapers, no steam rollers, no bulldozers. Our tools are picks, hoes and flat-faced shovels; our power is Chinese men, women, children — enough of them to cover an airfield. Hand carried baskets and pony-drawn carts are our transports. Enough willing hands can equal a bulldozer. A ten-ton concrete roller, drawn by 250 Chinese laborers, smoothes the patched bomb craters again.

After a raid, coolie work teams swarm over the field, cleaning debris from the craters which have been designated first in priority. In a few hours the runways are smooth again and the teams move to repair taxiways, then hardstands and finally the miscellany of less damaging craters scattered about the field.

While this work is in progress the airdrome officer is out with flag and walkie-talkie guiding our incoming planes, and AAF crews are splicing wires, replacing connections and restoring the normal communications. When radio contact has been reestablished, runways repaired and damaged aircraft cleared away, we concentrate on night fighting facilities, setting up flares or repairing ground lights and markers. The reconstruction job after our worst raid took but seven hours.

On the personal side our living quarters aren't as nice, our chow isn't as good, our supplies aren't as plentiful, and our geographical surroundings aren't as safe —but I would not trade our principal airdrome in China for Mitchel, Bolling, Randolph, Maxwell or any other field in the States. Our field can handle as much traffic as the best of them and with the same efficiency.

We have established our Chinese bases for combat operations and we have learned through experience that we can maintain heavy flying schedules despite all the Japs can do. Rocks and coolie hands are unlimited. Our airfields are as permanently established as Chinese customs. ☆

NOTES ON

WOMEN'S ACTIVITIES IN THE AAF

Father is in the Air Forces, mother is a nurse's aid at the hospital or works at the sub-depot so somebody has to look after the children. Before you know it AAF women have organized a day nursery for children of post personnel. Through the "Spotters" organization, wives with training in nutritional and kindergarten work are often found to provide necessary care.

Fifteen children, sons and daughters of officers stationed at Bolling Field, D. C., have made more than 10,000 surgical dressings for the Red Cross during vacations and on Saturday mornings. The unit is made up of twelve girls and three boys, between nine and sixteen years of age.

OFFICERS' wives of the Smoky Hill Army Air Field have provided their own unique answer to the housing problem in Salina, Kan., with their popular Fly-a-Way Club. Names and telephone numbers of the club's "hospitality committee" are listed on bulletin boards at the railroad station, hotels and at the airbase; stranded families who arrive in town with no place to stay are invited to call members "at any time during the day or night." And they do.

The club has a practical way of discovering available rooms and apartments almost before they are vacated. The local Chamber of Commerce supplies some of the listings, door-to-door canvasses produce others and an informal "espionage" system worked out with the town's milkmen, postmen and delivery boys serves to keep club members posted on when families plan to move out.

IF there's apricot pie on the menu in the March Field mess, GIs can thank the AAF Woman's Club on that base. When a shortage of help endangered the apricot crop of Riverside, Calif., seventeen club members donned aprons and settled down to pitting and cutting more than 3,000 pounds of the fruit for Army use.

WITHIN a few hours after the announcement that the station hospital at Barksdale Field, La., could handle no more private cases because of the shortage of registered nurses, the group of the local woman's club spotters had found in its files the names of fifteen officers' wives who formerly had been trained nurses. This group, which keeps personnel records listing special qualifications of volunteers at each post, immediately called the fifteen women and told them of the crisis. Although none had time for all-day work, each was anxious to do part-time duty. A schedule was worked out, and on the following day the hospital's CO was assured he would have enough nurses to keep the women's ward open.

SPEAKING of hospitals, the Woman's Club of Perrin Field, Sherman, Texas, has installed and equipped a complete maternity ward in the post hospital where 58 babies already have been delivered. Officers' wives, trained as Red Cross nurse's aids, do a major portion of the work in this ward. As for the problem of what to do with Sonny when mother wants to get away for a day or a few hours to go to the Red Cross workroom or buy that birthday gift for Aunt Susan, these alert women have the answer for that, too. They have a day nursery service, free to any mother on the post, where a woman trained in child care is on duty. Her salary is paid by the club.

AAF men at the Garden City Army Air Field, Kan., now have someone to look after their wives and new babies home from the hospital. Army wives of the women's volunteer branch of the post's Personal Affairs Division are quick to respond to requests for help. They see that grocery needs are met; they tidy the house, bathe baby and give the young mother what help she needs during that difficult post-hospital period.

NO hostesses could be found to take charge of the officers' club canteens at Salinas Army Air Base, Calif., so members of the post Woman's Club have taken over the job. Working shifts, members are on duty from 0830 to 1700.

MEMBERS of the Robins Field Woman's Club, Macon, Ga., not only restored and repaired a century-old house as a service club for enlisted men on the field, but they even planted gardenias by the door for the men to pick for their girl friends. ☆

Roll of Honor

A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

DISTINGUISHED SERVICE CROSS

Bade, Jack A., Lt.
Beams, James C., Maj.
*Billingsley, Leonard F., Capt
Brandon, William H., Maj.
*Brown, Walter I., S/Sgt.
Caldwell, Kenneth M., Capt.
Carpenter, Reginald L., Lt.
Carrington, John R., T/Sgt.
*Christensen, Harold R., Lt.
Clark, Philip R., Lt.
Clary, Guy W., S/Sgt.
Crandall, Donald D., S/Sgt.
Dallas, Frederick W., Jr., Capt.
Dalton, Malcom C., S/Sgt.
Diehl, John H., Jr., Capt.
Donegan, John M., Lt.
*Durand, Frederick W., S/Sgt.
Dyer, Fred W., Lt.
*Edeburn, Harry E., F/O
*Emerson, Elwood R., Lt.
Engel, Russel W., Lt.
Ent, Uzal G., Brig. Gen.
Faires, George D., S/Sgt.
Fox, Edward K., T/Sgt.
Frazier, James L., Jr., S/Sgt.
Garris, Benjamin L., Lt.
Gay, William M., Capt.
Gilpin, John A., Lt.
Goldberg, Hyman M., Lt.
Hall, Donald P., Lt. Col.
Hardison, Felix M., Lt. Col.
Harrison, Edgar E., S/Sgt.
Hawkes, Thomas C., Lt.
Hodge, Dexter L., Maj.
Hoff, Thomas A., S/Sgt.
Horton, Robert W., Lt.
Hudson, Charles S., Lt.
Hull, Charles T., Lt.
James, Joseph H., S/Sgt.
Jamison, Roger W., Lt.
Johnson, Albert L., Capt.
Johnson, Gerald W., Capt.
Kase, Louis N., T/Sgt.
Krug, Richard M., Lt.
Lackness, Berdines, Lt.
Lambert, James V., S/Sgt.
*Land, George R., Lt.
Larson, Harold B., Lt.
Leverette, William, Major
London, Charles P., Capt.
Lonsway, Louis G., S/Sgt.
Ludolph, George L., Lt.
Lynch, Thomas J., Capt.
Mahurin, Walker M., Capt.
*Martin, Ernest W., S/Sgt.
Merkel, Howard W., Capt.
Miles, James E., Capt.
Miller, Robert E., Capt.
*Mooney, Robert C., Capt.
Murphy, Philip J., Cpl.
McArthur, Paul G., Lt.
McLaughlin, Frank B., Lt.
McLoughlin, John A., Lt.
McNeese, Harold G., Lt.
Nuchols, William L., Lt.
O'Neill, Brian, Lt. Col.
Partridge, Donald D., S/Sgt.
Patrick, A. R., Jr., S/Sgt.
Pear, Sidney A., Lt.
Phillips, Reginald H., Capt.
Ploetz, Frederick F., Lt.
Posey, James T., Lt. Col.
Potter, A. J., S/Sgt.
Potts, Ramsay D., Jr., Maj.
Rist, Robert P., Lt.
Roberts, Eugene P., Maj.
Roohe, John R., Capt.
Sans, Charles H., S/Sgt.
*Saunders, Lester W., S/Sgt.
Schiltz, Glenn D., Lt.
Sellers, Thomas D., Lt.
Skinner, William E., T/Sgt.
Smith, Edmond H., S/Sgt.
Smith, Jack E., Sgt.
Smith, Mack H., S/Sgt.
Steen, Zerrill J., S/Sgt.
Thomas, Jay P., Capt.
*Van Ness, James, T/Sgt.
Vin, Charles A., Jr., Lt.
Ward, Emery M., Capt.
Warmer, Benjamin F., S/Sgt.
Watkins, James A., Capt.
Watt, James R., Lt. Col.
Westerbeke, Donald G., Lt.
Whalen, Norman M., Lt.
Wherry, William B., T/Sgt.
Whitson, William D., Capt.
Wiegand, Arthur H., Lt.
Wilson, Avis K., S/Sgt.
Wilson, Frederick M., S/Sgt.
Wright, Ellis W., Jr., Capt.
Wylie, John W., Lt.
Yevich, Edward S., S/Sgt.

* *This symbol designates awards made posthumously to AAF personnel.*
† *This symbol designates awards made by the Navy Department.*

DISTINGUISHED SERVICE MEDAL

Brant, Gerald C., Maj. Gen.
Edwards, Idwal H., Maj. Gen.
Gooden, Clarence W., Lt.
Hanseli, Haywood S., Brig. Gen.
†House, Edwin J., Maj. Gen.
McArthur, Paul G., Lt.
Pratt, Henry C., Maj. Gen.
Smith, Frederick H., Jr., Col.

LEGION OF MERIT

Adazzio, John J., 1st Sgt.
Aldworth, Richard T., Col.
Allen, Ron V., M/Sgt.
Armstrong, William J., S/Sgt.
Anderson, Elmer, Lt.
Antosh, Raymond L., M/Sgt.
Arnold, Elroy W., T/Sgt.
Ashcraft, Gus H., Capt.
*Ayling, John G., Col.
Baker, David H., Col.
Bailey, Daniel G., Sgt.
Ball, Quentin O., M/Sgt.
Ball, William, Col.
Bandy, George R., Lt.
Barker, John De F., Col.
Barnhart, Lawrence E., Lt.
Barrett, Quentin D., Sgt.
Barron, Robert M., Lt.
Bartron, Harold A., Col.
Bates, Earl E., Jr., Col.
Beam, Rosenham, Col.
Benda, Charles J., Col.
Benzency, Eddie, M/Sgt.
Bergan, Thomas J., S/Sgt.
Bernard, Wilbur L., Sgt.
Bertenshaw, Arthur S., M/Sgt.
Birchard, Frederick B., Cpl.
Bohon, William H., M/Sgt.
Booth, Charles L., Col.
Booth, William B., M/Sgt.
†Born, Charles F., Brig. Gen.
Bowles, Luther R., M/Sgt.
Boyd, Max B., Maj.
Brand, Harry B., T/Sgt.
Briggs, Leonard F., Cpl.
Brumfield, Henry A., Capt.
Bruneau, Harry A., Cpl.
Buchanan, David H., Lt.
Buchanan, James V., Sgt.
Campbell, John E., M/Sgt.
Carnes, Kermit, Sgt.
Carson, Cecil W., T/Sgt.
Caudill, Melvin, M/Sgt.
Chapman, Wallace S., 1st Sgt.
Chase, Jeremiah A., Lt. Col.
Chauncey, Charles C., Brig. Gen.
Chew, Robert P., M/Sgt.
Choka, Norman F., M/Sgt.
Cirella, Joseph, Sgt.
Claxton, William T., Maj.
Cohen, Leonard P., Capt.
Colancecco, Carino J., M/Sgt.
Collins, Charles R., M/Sgt.
Compton, Keith K., Col.
Cook, Everett H., Col.
Coulter, Roy H., M/Sgt.
Crawford, Harold E., M/Sgt.
Crawford, James M., S/Sgt.
Creighton, Neal, Col.
Crom, William H., Col.
Crutchfield, Earl J., M/Sgt.
Cunningham, Floyd D., S/Sgt.
Czerniakowski, Edwin M., S/Sgt.
Dahlman, Enoch J., T/Sgt.
D'Andrea, Anthony P., S/Sgt.
Dashoff, Joseph, M/Sgt.
Dawdy, John R., M/Sgt.
Disney, Joseph I., T/Sgt.
Dixon, Arthur, Maj.
Donahey, William S., Lt. Col.
Dozier, James E., M/Sgt.
Drown, Nathan C., M/Sgt.
Dunn, Leonard R., T/Sgt.
Dunn, Ray A., Brig. Gen.
Emery, Everett W., M/Sgt.
Evans, Robert H., T/Sgt.
Fanning, Leo F., M/Sgt.
Feldmann, Carl R., Col.
Ferguson, Homer W., Col.
Ferguson, Robert L., Sgt.
Ficken, William L., Lt.
Fitzgerald, Archie A., Pvt.
Fitzsimmons, Paul W., M/Sgt.
Flickinger, Donald J., Lt. Col.
Flynn, William E., Pfc.
Futchik, William E., M/Sgt.
Gall, Joseph J., Pfc.
Gardiner, William T., Col.
Gardner, Edgar W., Lt. Col.
Gatrost, Archie M., Lt.
Geerlings, Gerald K., Maj. (& OLC)
Genga, Adam, M/Sgt.
Gilkeson, Adlai H., Brig. Gen.
Gillet, Louis M., T/Sgt.
Gommillion, Royce, T/Sgt.
Gordon, Virgil C., Col.
Green, James C., S/Sgt.
Green, Lewis F., Maj.
Griffith, Henry D., T/Sgt.
Grobmyer, John C., Lt.
Gurbada, Felix, S/Sgt.
Hadlow, Gordon H., M/Sgt.
Hall, Edward N., Lt.
Halterman, George W., Maj.
Hanford, Dudley D., Jr., T/Sgt
Harmon, Theodore B., S/Sgt.
Head, Albert M., S/Sgt.
Heidrich, William F., T/Sgt.
Henry, Draper F., Col.
Henry, William A., S/Sgt.
Hess, Samuel B., Lt.
Hill, William G., M/Sgt.
Hinton, Hubert B., M/Sgt.
Hobbs, Lewis E., Col.
Hollerbach, Floyd C., M/Sgt.
Hollstein, Charles P., Lt. Col.
Horne, Wendel C., M/Sgt.
Hoskins, William J., Sgt.
Howard, George E., Lt. Col.
Hudson, Sidney G., Cpl.
Humphrey, Watts S., Lt. Col.
Hurford, Thomas W., S/Sgt.
Ireland, Loren E., Lt. Col.
Jaenicke, Reinhart W., Lt.
Jeffus, John H., Col.
Johnson, Clarence G., T/Sgt.
Johnson, Robert J., Sgt.
Joos, Jacques, S/Sgt.
Kallal, George, M/Sgt.
Kamykowski, Frank S., Capt.
Kane, John R., Col.
Karabinos, Joseph M., S/Sgt.
Keech, James O., T/Sgt.
Keeteman, Charles W., Jr., Sgt.
Kendall, Harry A., Lt. Col.
Kepner, William E., Maj. Gen.
King, Donald E., M/Sgt.
King, Verne W., S/Sgt.
Kiser, James W., M/Sgt.
Kopp, Robert L., M/Sgt.
Krambery, Joseph, M/Sgt.
Kyle, Reubea, Jr., Col.
Laboda, Nicholas C., T/Sgt.
Lambert, Raymond J., M/Sgt.
Lande, Leon, T/Sgt.
Lang, Robert W., M/Sgt.
Larocque, Joseph, Jr., Lt. Col.
Larsen, Howard J., Jr., T/Sgt.
Lauer, Mark R., Lt.
Lawrence, David B., Lt.
Lazear, John M., Capt.
Leffler, Charles H., M/Sgt.
Lein, Harvey J., Cpl.
Lesky, Mervin C., M/Sgt.
Lester, Raymond T., Col.
Levine, Arnold, Capt.
Likes, David H., Maj.
Lockridge, Warden W., M/Sgt.
Lockwood, Patrick B., M/Sgt.
Lopez, Tony F., Pvt.
Lowery, Bruce, M/Sgt.
Ludwig, Clyde M., S/Sgt.
Lund, Walter, Capt.
Madden, Francis M., M/Sgt.
Maidel, Mark J., Maj.
Malloy, John T., Lt. Col.
Marcilenis, Ben F., Sgt.
Markel, Kenneth, Cpl.
Martin, Roscoe J., Lt.
Martini, Celeste, M/Sgt.
Matheny, William A., Col.
Maupin, Dale V., Cpl.
Mears, Frank H., Col.
Melton, Thomas O., Cpl.
Merkel, Edmund H., M/Sgt.
Messmore, Waldine W., Col.
Miller, Jack H., Cpl.
Mobroten, Elmer J., S/Sgt.
Money, Glenn W., M/Sgt.
Mooney, Henry K., Col.
Moore, Ernest, Col.
Moore, Malcolm A., Lt. Col.
Moose, William L., T/Sgt.
Mueller, Charles, M/Sgt.
Myers, Railey E., M/Sgt.
McAndrew, Junior, S/Sgt.
McClenahan, Robert W., Col.
McCombs, Robert N., M/Sgt.
McCormick, Charles W., M/Sgt.
McDonald, George W., Col.
McGraw, James E., M/Sgt.
Neal, Harry B., Lt.
Neblock, Charles N. T/Sgt.,
Nero, Ulysses S., Maj.
Nichols, Mervin E., M/Sgt.
Nutter, Ralph H., Maj.
O'Connell, Francis J., S/Sgt.
O'Hara, William F., Capt.
Olsen, Marvin, Sgt.
Orlich, John, Sgt.
Ortner, Henry, Capt.
Osteen, Hal L., M/Sgt.
Ott, Isaac W., Col.
Pafford, Buford G., M/Sgt.
Paradis, Orville, Sgt.
Pearce, Fred W., Sgt.
Peffer, Joseph, M/Sgt.
Pekol, Edward J., M/Sgt.
Pendleton, James P., M/Sgt.
Pennington, Harold E., M/Sgt.
Phillips, Arnold H., Sgt.
Piddock, Charles A., Col.
Pierce, Arthur J., Col.
Pizzuto, Joseph, T/Sgt.
Planeta, Adolph M., M/Sgt.
Plyler, William C., M/Sgt.
Powers, Barron C., Lt. Col.
Presley, Carol S., Sgt.
Procknow, John J., S/Sgt.
Prouty, George, Sgt.
Radam, David, Maj.
Rangel, Albert, M/Sgt.
Ray, Robert W., M/Sgt.
Roberts, Jack, Lt. Col.
Robinson, Ernest G., T/4th Gr.
Rogers, Weldon R., Sgt.
Roosevelt, Elliott, Col.
Rosar, William H., Lt.
Ross, Donald R., M/Sgt.
Royce, Ralph S., Maj.
Rupert, Charles C., T/Sgt.
Russell, Lamar S., Capt.
Russell, William H., Lt.
Rutherford, Howard L., M/Sgt.
Ryder, Franklin A., Sgt.
Salisbury, Arthur G., Col.
Saville, Gordon P., Brig. Gen.
Schauer, Paul C., Maj.
Schliesman, Donald A., T/5th
Schneider, Max F., Col.
Schneider, William H., Sgt.
*Schuster, Julian S., Maj.
Seaburg, Fritz, M/Sgt.
Searcy, Charlie E., M/Sgt.
Shand, Ian, M/Sgt.
Shumway, Duane E., Sgt.
Simmons, Benjamin T., Capt.
Slimmer, Hugh P., Sgt.
Smith, Elmer O., Lt.
Spaatz, Carl, Lt. Gen.
Spaeth, Joseph J., Lt.
Stone, Rodney M., T/Sgt.
Stowell, James S., Col.
Strickland, Auby C., Brig. Gen.
Strother, Willie A., M/Sgt.
Stumpff, Donald L., Lt.
Tibbetts, Kingston E., Col.
Tompkins, Glenn K., M/Sgt.
Trebon, Veranard H., Pfc.
Turner, Harry, M/Sgt.
Twining, Nathan F., Maj. Gen. (& OLC)
Umler, Melvin J., M/Sgt.
Veliz, Joe R., M/Sgt.
Vidrine, Joseph A., M/Sgt.
Virgili, Bruno J., Capt.
Walker, Kenneth N., Brig. Gen.
Waring, Walter W., T/Sgt.
Wasnick, Joseph R., M/Sgt.
Weaver, James P., M/Sgt.
Weidner, Clarence, Capt.
White, Donald P., Lt.
Williams, Dewey J., M/Sgt.
Williams, Fred L., Cpl.
*Williams, William R., Sgt.
Winkle, Charles B., Lt. Col.
Wood, Floyd B., Col.
Wood, Wilbur H., Lt. Col.
Woodman, William C., M/Sgt.
Woodworth, Lynn F., Maj.
Wooks, Hubert K., M/Sgt.
Yost, Paul W., S/Sgt.
Yount, Dean B., Capt.
Zavesky, Michael, Pvt.
Zoltak, Andrew T., Lt.

SILVER STAR

Abernethy, Robert Joseph, Capt.
Able, John J., Sgt. (& OLC)
Ackerman, Lonnie L., Sgt.
Adamczyk, Theodore S., Cpl.
Adams, Burnell W., Lt.
Adams, William H., S/Sgt.
Adkins, Edwin W., Capt.
Adler, Charles E., Lt.
Adler, Robert T., Lt.
Ahlbeck, Torsten W., S/Sgt.
Akers, Marion J., Maj.
Albert, Frank J., Sgt.
Alexander, Chester R., T/Sgt.
Alexander, George C., Lt.
Alger, Martin P., Capt.
Allen, Edgar J., E., S/Sgt.
Allen, Eugene H., S/Sgt.
Allen, Johnson B., Capt.
Allers, Howard C., Capt.
Ammons, Vernon G., Lt.
Anderson, Charles L., Lt.
Anderson, Eugene C., Lt.
Anderson, Harold J., F/O
Anderson, Lewis A., Lt.
Anderson, Orvil A., Brig. Gen.
Anderson, Ray U., S/Sgt.
Anderson, Wyman D., Lt.
Andrews, Aaron L., Lt.
*Andrews, Byron G., Lt.
Andrews, Willie A., T/Sgt.
Arant, John R., Lt.
Ardery, Philip P., Capt.
Aring, Wilbur W., Lt. Col.
Armitage, John V., Lt.
Arnold, Robert W., Lt.
Atchue, Henry W., Pvt.
Austin, Robert N., Lt.
Avellino, Sabastiano S., Sgt.
Averill, Carl P., T/Sgt.
Ayers, Randolph H., S/Sgt.
Ayling, Edward C., S/Sgt.
Bacon, Charlie M., S/Sgt.
Baer, Edward L., S/Sgt.
Baganz, Paul C., Lt.
Baird, Joseph C., Sgt.
Baldwin, Raymond W., Jr., Lt.
Ball, Edgar D., Capt.
Baluta, Alphonse D., S/Sgt.
Bancroft, Harvey C., S/Sgt. (& 2 OLC)

By Way of Explanation

The names of AAF personnel to whom awards have been made are now listed in the ROLL OF HONOR only after they have appeared in General Orders. Transmission of this information to Headquarters, Army Air Forces, frequently involves a delay of several months between the time an award is made and its availability for publication in this department.

The number of names that can be listed in any one issue is controlled by the limited space available, and a considerable backlog of unpublished names has accrued. It is intended, in due course, that all awards to AAF personnel shall be listed here. If your name, or the name of your friend or relative, does not appear immediately following notification of the award, please consider the above facts before addressing inquiries to the AIR FORCE Editorial Office.

All ranks and grades given in ROLL OF HONOR listings are those held by the recipient of the award at the time it was made.

Roll of Honor

A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

(Continued from Preceding Page)

Banks, Jack R., Capt.
Banks, William D., Lt.
Barbee, John Y., Lt.
Barber, Charles E., Lt.
Barnes, Clayton J., Lt.
*Barnes, George R., Lt.
Barnes, Joshua H., Capt.
Barr, Dale F., Sgt.
Barret, Maxwell P., Lt.
Barron, Dante G., S/Sgt.
Barry, John J., Sgt.
Barthel, Carl C., Capt.
Barton, Bruce D., Capt.
Bathrick, Ward R., S/Sgt.
Baxley, Edwin L., Lt.
Beat, Walter B., Maj.
Beatty, Clyde W., Jr., Lt.
Beaudry, Theodore C., T/Sgt.
Bebout, Charles R., S/Sgt.
Beckhelm, George B., Lt.
Beckstrom, Kenneth W., Lt. (& OLC)
Beeson, Duane W., Lt.
*Behling, Lincoln E., Capt.
Bek, Philip L., Lt.
Bellmore, Donald O., Sgt.
Bemrick, Harold J., S/Sgt.
Benedetti, Eugene, Lt.
Benna, Michael A., Cpl.
Bent, Henry L., T/Sgt.
Berg, Harry, S/Sgt.
Berkowitz, Marvin, S/Sgt. (& OLC)
Bernstein, Ted, T/Sgt.
Berry, Austin L., Maj.
Berta, Wayne M., Lt.
Bess, Bloice M., T/Sgt.
Bethea, William E., Lt.
Bevan, William, Jr., Sgt.
Beverly, Paul E., S/Sgt.
Bilby, Glade B., Lt. Col.
Binius, Walter J., Lt.
Bird, Ira M., Lt.
Blain, John D., F/O
Blais, Joseph P., T/Sgt.
Blakeslee, Donald J. M., Lt. Col.
Blanton, Joseph B., Pvt.
Blazicek, Rudolph, Lt.
Blocker, Robert H., T/Sgt.
Blythe, E. C., Lt.
Bolton, Frank R., S/Sgt.
Borders, Robert H., III, Lt.
Bordner, Dale E., Sgt.
Boren, Thomas L., Jr., Lt.
Borrelli, Anthony A., S/Sgt.
Bowles, Jack G., S/Sgt.
Bowling, Walter L., Sgt.
Bowman, Conrad K., S/Sgt.
Bowman, Jack, S/Sgt.
Boyd, Gerald H., M/Sgt.
Boyle, Fred E., T/Sgt.
Bradley, John L., Capt.
Brady, Henry G., Jr., Maj.
Branzell, George R., Lt.
Brecht, Harold M., Capt.
Brehm, James A., S/Sgt.
Brenneman, Walter K., Lt.
Brewer, Edwin H., Lt.
Bright, John G., Maj.
Brock, Eldon J., S/Sgt.
Brooks, John A., Maj.
Browder, Bennet P., Lt.
Brown, Charles W., Capt.
Brown, George S., Maj.
Brown, John K., Jr., Col.
Brown, Paul G., Capt.
Brown, R. D., S/Sgt.
*Brown, William M., S/Sgt. (& OLC)
Brumley, Lyster A., Lt.
Buchanan, Jim Bright, Lt. (& OLC)
Bullis, Harry J., Maj. (& OLC)
Bunderson, Mack V., Lt.
Bunker, Walter I., Lt.
Burkhart, Roy D., Lt.
Burnside, Ernest W., Sgt.
Burton, Jack R., S/Sgt.
Buske, George W., Sgt.
Butler, Robert H., Lt. (& 2 OLC)
Bybee, Donald E., S/Sgt.
Byrne, Robert J., Lt.
Caben, George L., Lt.
Cain, James R., Sgt.
Cakert, Thomas F. X., Lt.
Calderala, Frank L., S/Sgt.
Caldwell, Richard F., Jr., Lt.
Calhoun, John C., Lt.
Calhoun, William R., Jr., Maj. (& OLC)
Callaway, Roy L., Lt.
*Campbell, Glenn A., Sgt.
Campbell, William B., Lt.
Canning, Douglas S., Lt.
Canter, Soloman J., S/Sgt.
Cantley, Eugene L., Sgt.
Cantrill, Rufus H., Sgt.
Capen, Paul N., Sgt.
Capocefalo, Robert J., S/Sgt.
Cappello, Angelo J., S/Sgt.
Carey, John A., Lt.
Carlson, David E., Cpl.
Carlson, Ellis E., S/Sgt.
Carnal, Walter F., Jr., Lt.
Carney, John W., S/Sgt.
Carroll, Joseph A., S/Sgt.
Carroll, Wesley M., Lt.
Carter, Joseph E., Lt.
Carter, Thomas H., T/Sgt.
Cartwright, Philip E., Lt.
Cartwright, Roger A., Lt.
Caruthers, Marion F., Maj.
Cason, James R., Lt.
Cate, Gerald R., T/Sgt.
Ceryanec, Victor J., S/Sgt.
Chadwick, Wesley M., Sgt.
Chase, George S., S/Sgt.
Cherry, Earl M., T/Sgt.
Childers, Jack I., Lt.
Chilson, Robert E., Lt.
Christensen, Borden W., T/Sgt.
Christmas, Frederick A., S/Sgt.
*Christopher, Guyton M., Lt. (& OLC)
Christopherson, R. L., T/Sgt.
Clapp, William C., Lt.
Cleaveland, Arthur B., Lt.
Cline, Varney D., Lt.
Clinkenbeard, J. W., Sgt.
Clizbe, Reginald J., Maj. (& OLC)
Clutter, Clyde M., Col.
Coatney, Donald S., S/Sgt.
Coats, James W., T/Sgt.
Cochran, Joseph W., Lt.
Cochrane, Alexander M., S/Sgt.
Cody, Wathen F., Sgt. (& OLC)
Cohan, Joseph M., S/Sgt.
Colburn, Frank M., Lt.
Cole, Albert V., Lt.
Coleman, Edward A., S/Sgt.
Collier, Charles E., Lt.
Connelly, Louis J., Jr., Capt.
Conroy, Thomas C., Capt.
Conti, Philip, Lt.
Conway, Roger J., Lt.
Cook, Allen S., S/Sgt.
Cook, Bailey C., Lt. Col.
Cook, Burnell A., T/Sgt.
Cook, Gerald C., Sgt.
Cook, Maxworth, S/Sgt.
Cook, Vernon S., S/Sgt.
Cook, Walter N., Jr., Cpl.
Cook, William J., Jr., Lt.
Coolidge, Barnum, Lt.
Copley, Richard D., S/Sgt.
Cox, Roland B., S/Sgt.
Cox, Williston M., Jr., Capt.
Craig, Dennis, T/Sgt.
Crane, Frank E., S/Sgt.
Crane, Ralph, T/Sgt.
Crawbuck, John, S/Sgt.
Crawford, George A., Lt.
Crawford, William, Jr., Lt. (& OLC)
Cromer, Daniel H., Maj.
Crosby, Raymond B., Col.
Cross, Adelbert D., Maj.
Crowe, James B., T/Sgt.
Culbertson, Norman C., S/Sgt.
Culpepper, Claude A., Capt.
Cummings, William R., Cpl.
Cunningham, Cletus A., Capt.
Cunningham, Joseph W., Lt.
Curl, James G., Maj.
Curren, Arthur T., Lt.
Curry, William L., Lt.
D'Agostino, Joseph A., Sgt.
Daigle, Llewellyn C., Maj.
Dallaire, Albert F., S/Sgt.
Danahy, Richard C., Lt.
Daniel, Denton H., Capt.
Daniels, William A., Lt.
Dardis, Ronald A., T/Sgt.
Davidson, William P., Sgt.
Davidson, William R., Lt.
Davis, Harlan G., S/Sgt.
Davis, Robert L., Lt.
Dayhuff, Harry J., Lt. Col.
*Deal, Manford S., S/Sgt.
Dean, Fred M., Lt. Col.
Deaton, George C., Maj.
De Beer, Eugene C., Lt.
De Clerque, Donald A., Lt.
Dedmon, Samuel Edward, S/Sgt.
*De Freese, Norman E., Lt.
De Graffenreid, Edwin L., F/O
De Loach, Ralph K., Capt.
Delp, Rea J., S/Sgt.
Demcovich, John C., Cpl.
Denault, Francis P., Lt.
Derr, Herbert O., Lt. (& 2 OLC)
Deveuve, James P., Lt.
De Witt, Flint C., Lt.
Deyarmond, Jacob J., Pfc.
Dick, Charles S., Sgt.
Dienelt, James H., Capt.
Di Labbio, Paul, F/O
Dolan, Robert W., T/Sgt.
Donahay, Joseph L., Sgt.
Donovan, Joseph A., Lt.
Donovan, Stanley J., Col.
Doolittle, James H., Maj. Gen.
Dore, John J., Jr., Lt.
Doremus, Robert L., S/Sgt.
Dotson, Delmar, T/Sgt.
Dougherty, William E., Lt.
Douglas, Harold W., Cpl.
Dow, Edgar F., T/Sgt.
Dowd, John F., S/Sgt.
Downer, Charles B., Lt.
Downs, Edward F., Lt.
Dreckman, Harold G., Lt.
Du Bard, James D., Lt.
Dubisher, Francis E., Lt.
Duffy, Richard E., Lt.
*Dukes, Joseph C., Cpl.
Dulac, Arthur J., T/Sgt.
Dumont, Gabriel O., Lt.
Duncan, Glenn E., Maj.
Dunmore, George P., Lt. (& OLC)
Durbeck, Arthur G., Lt. (& OLC)
Durbin, Henry J., Sgt.
Durburow, Allen R., Jr., S/Sgt.
Eckholt, David J., Pvt.
*Ecklund, Gaylord P., Lt.
Eddison, Baker E., Lt. Col.
Edgar, Thomas D., Cpl.
Edwards, Victor A., Sgt.
Egan, John F., Col.
Ehlers, Melville V., Lt.
Ellington, Edward H., Capt.
Elliott, William W., Lt.
Ellison, Coy B., Lt.
Elrod, William W., Pfc.
Emch, David W., Lt.
Emerson, William J., Capt.
Emminger, Robert S., S/Sgt.
Engler, Howard E., Col.
*Epperson, William S., Lt.
Estes, Wilbur C., S/Sgt.
Evans, Henry W., Lt.
Evans, Joseph P., Sgt.
Evans, Roy W., Capt.
Everest, Frank F., Col.
Fahrenhold, William W., Sgt.
Falls, Robert E., Lt.
Fargo, Donald K., Lt. Col.
Farquharson, Albert B., Lt.
Farrell, Clyde R., S/Sgt.
Farrell, James, Sgt.
*Farron, Leonard W., Lt.
Faucett, Homer W., Lt.
Faulkner, Cecil L., Lt. Col.
Feille, Edward A., Jr., Lt.
Feind, Roger H., Pvt.
Fern, Richard S., S/Sgt.
Fields, James Richard, S/Sgt.
Fisher, Albert E., S/Sgt.
Fitzsimmons, Marcus C., Sgt.
Flaspoehler, Edward P., Lt.
Flint, Dewitt C., Lt. (& OLC)
Foltz, Leroy F., Lt.
Fonda, Willard C., Lt.
Ford, Donald J., S/Sgt.
Forget, Leo J., T/Sgt.
Foster, John P., T/Sgt.
Fowble, Edward L., Lt.
Fox, William K., Lt.
Francis, Magnus W., Lt.
Franco, Victor H., Lt.
Frankenfield, Earl R., Pfc.
Franz, Jacob H., Lt.
Fraser, William G., Pfc. (& OLC)
Fraychak, Michael, S/Sgt.
Freeman, James N., Lt.
Freid, Joseph A., Lt.
Frieed, George H., S/Sgt.
Frost, John, II, Lt.
Frumkin, Gabriel J., Lt. (& OLC)
Fuka, Vern F., Sgt.
*Galyon, Walter T., Lt.
Gamble, William C., Cpl.
Ganem, George A., Sgt.
Garcia, Henry, S/Sgt.
Gardiner, William T., Col.
Garman, Ralph S., Lt. Col.
Gatewood, Joel W., Lt.
Gaunt, Frank L., Capt.
Gayda, Walter A., Lt.
Gearon, Roy T., T/Sgt.
Geez, Raymond A., S/Sgt.
George, Robert E., Pvt.
Gerhart, John K., Col.
Germann, Oliver R., S/Sgt.
Gerrick, Clarence W., Capt.
Gerry, Walter R., Lt.
Gerzin, Walter J., Lt.
Gibbs, John Lewis, Lt.
Gibson, Junior C., Pvt.
Gibson, Robert E., S/Sgt.
Giesel, Raymond E., Lt.
Giguere, Varis, S/Sgt.
Gilbride, James W., Lt.
Gill, James M., Lt.
Gill, William H., Lt.
Gillespie, Bernard A., Lt.
Gilmore, Edwin B., Capt.
Gilmore, James D., Capt.
Gilmour, Frederick T., S/Sgt.
Gionet, Leonard A., T/Sgt.
Glendenning, Calvyn W., Lt.
Glogowski, Sylvester J., Sgt.
Glotzbach, Gene R., Lt.
Glyer, John R., Lt.
Goerke, Delton C., Lt.
Gomez, John D., Sgt.
Gomonsky, Phillip, Cpl.
Gonzalez, Manuel E., Jr., S/Sgt.
Goolsby, George S., Lt.
Gormly, Samuel J., Jr., Lt. Col.
Gosick, Leon W., S/Sgt.
Goulding, Robert L., T/Sgt. (& OLC)
Graham, James F., S/Sgt.
*Grant, Reginald D., Lt.
Grantham, Charles W., T/Sgt.
Grasso, Emile A., S/Sgt.
Gray, Vernon L., Cpl.
Green, George E., Cpl.
Green, Louis S., Lt.
Green, Miles L., Lt.
Green, William F., S/Sgt.
Greenblatt, Victor, Lt.
Greene, George D., Jr., Lt. Col.
Greenfield, Bernard, S/Sgt.
Greenfield, Robert I., T/Sgt.
Greening, Charles R., Lt. Col.
Greenside, Arthur M., T/Sgt.
Gregori, Raymond P., S/Sgt.
Gregory, Stanford W., Lt. Col.
Griebel, Robert E., S/Sgt.
Guerry, Alexander, Jr., Capt.
Gunn, James A., Jr., Capt.
Gutwald, Robert R., S/Sgt.
Gwynne, Robert W., Lt.
Haag, Francis E., Jr., Lt.
Haas, Vernon D., S/Sgt.
Hagenbuch, Glenn E., Maj. (& OLC)
Hagerty, James R., Lt.
Haley, Robert B., Lt.
Hall, Gordon E., Maj.
Hall, John V., T/Sgt.
Hall, Thomas H., T/Sgt.
Hallock, Edward C., Lt.
Hamilton, Frederick B., Lt.
Hamilton, William M., Sgt.
Hammond, Thomas G., Lt.
Hampton, Edgar W., Lt. Col.
Hand, Robert L., Lt. (& OLC)
Hansen, Alfred D., Lt.
Hansen, Glen R., T/Sgt.
Hansen, John H., M/Sgt.
Hansen, Richard E., Cpl.
Hanson, Owen R., T/Sgt.
Harbour, David F., Capt.
Hardin, Ross G., S/Sgt.
Hargrove, James O., Lt.
Harman, James, Capt.
Harris, Ernest A., Capt.
Harris, Eugene T., S/Sgt.
Harris, James J., S/Sgt.
Harris, William J., Jr., F/O
Harrison, James T., Lt.
Harry, William Russell, Lt.
Hartline, Marshall L., Lt.
Hassinger, Warren R., T/Sgt.
Hastings, Harold T., Capt.
Hatcher, William A., Jr., Col.
Hatfield, Willard G., Lt.
Hawkins, Phil H., Lt.
Haxthausen, Frank D., S/Sgt.
Haymon, Albert W., T/Sgt.
Hazel, Milton E., T/Sgt.
Heimuth, Louis W., Lt.
Hellard, Leonard H., S/Sgt.
Helyer, Sydney J., S/Sgt.
Hendrichs, Sterling T., S/Sgt.
Hendricks, Landon C., Maj.
Henery, William M., Lt.
Herreid, Marvin, Sgt.
Herring, Robert R., Lt.
Heskew, Wayne R., Sgt.
Hess, Charles W., S/Sgt.
Hevener, Harold G., Lt.
Hicks, Chauncey H., Lt.
Hildebran, David H., T/Sgt.
Hilken, Ronald W., Lt.
Hill, Frank A., Maj.
Hill, James E., Lt.
Hill, Robert Ernest B., S/Sgt.
Himmel, Lynn M., Cpl.
Hinkel, Arthur, Cpl.
Hinkle, Carson M., Lt.
Hobson, Robert M., S/Sgt.
Hock, Herbert L., S/Sgt.
Hodge, Archibald B., Sgt.
*Hodson, Robert L., Maj.
Hoffman, Carl D., Capt.
Holguin, Jose L., Lt.
Holly, Richard M., Lt.
Holman, Leslie W., Maj.
Holmes, Walter T., Jr., Capt.
Holmes, William W., Cpl.
Holt, Harry L., Lt.
Holt, Robert S., Capt.
Homer, Cyril F., Lt.
Honaker, William F., Lt.
Honold, John L., Cpl.
Hood, John J., Lt.
Hooker, Robert H., Cpl.
Hooper, Leroy S., Lt.
Horder, Harris H., Pvt.
Hosman, Ralph W., Capt.
Houser, Oscar W., T/Sgt.
Houston, David, Sgt.
Howard, Alton W., Jr., Lt.
Howard, Curtis W., Sgt.
Howard, Robert I., Lt.
Howard, Thomas L., Jr., Lt.
Hoye, John J., Lt.
Hoyt, Eitoa, III, Lt.
Hubbard, Mark E., Maj.
Hubbell, Robert B., Capt.
Huddle, John R., Lt.
Huff, Lloyd G., Lt. (& OLC)
Hughes, Adolph, S/Sgt.
Hughes, Charles E., Lt.
Hughes, Marvin C., Lt.
Hunter, Anthony G., Col.
Hunter, Charles N., S/Sgt.
Hunter, Frank H., Lt.
Hunter, Willard G., S/Sgt.
Hurd, Donaldson B., Lt.
Hurd, Earl C., Lt.
Hurt, Libert T., S/Sgt.
Hutchins, Emery B., S/Sgt.
Hutchison, David W., Col.
Huttenen, Otto, Pvt.
Hutter, Howard J., Lt.
Hyman, Raymond B., T/Sgt.
Ingenhutt, William Weeks, Maj.
Ioman, Ira I., Pvt.
Jachim, Joseph A., S/Sgt.
Jack, Jean A., Capt.
Jackson, Eugene R., Maj.
Jackson, Harold D., T/Sgt.
Jackson, McDaniel B., Lt.
James, John W., Lt.
Janeshek, Frank J., S/Sgt.
Janic, Edmund F., Lt.
Jenna, John A., S/Sgt.
Jensen, Aage E., S/Sgt.
Jensen, Myron W., Lt.
Johannes, Steve L., Lt.
Johnson, David W., Capt.
Johnson, Donald G., Lt.
Johnson, Edward J., Sgt. (& OLC)
Johnson, Willet E., T/Sgt.
Johnston, Dewitt P., Lt.
Johnston, Ralph C., Lt.
Jones, John L., Lt.
Jones, Marcus O., Lt.
Jones, Robert S., Jr., T/Sgt.
Jones, William C., Maj.
Jones, William O., Lt.
Jopek, Elvin J., Cpl.
Joyner, Charles, M/Sgt.
Kaboth, Jack W., Lt.
Kaczmarek, Joseph A., S/Sgt.
Kahle, George Frank, Jr., Maj.
Kahn, William F., Lt.
Kaitala, Henry B., Lt.
*Kallina, Leon P., Lt.
Kane, Joseph W., F/O
Kane, Louis N., Lt.
Karas, Casimir, T/Sgt.
Kearby, Neel E., Col.
Keeley, Richard M., Sgt.
Kehan, Edmund P., Pvt.
*Keiran, Raymond A., Pvt.
Kelkey, Milton, Sgt.
Kelley, Clifford E., S/Sgt.
Kelly, Richard L., Cpl.
Kelly, Thomas H., T/Sgt.
Kelly, William J., Sgt.
Kendrick, George E., T/Sgt.
Kennedy, Chester C., Lt.
Kershner, Felix N., Capt.
Kettleson, Roger G., Lt.
Kiley, David T., Sgt.
Kilgore, Joe M., Capt.
Kimbell, Charles L., Lt.
King, Arthur G., Lt.
King, Carl G., Capt.
King, Charles W., Capt.
Kinnett, Paul, Jr., M/Sgt.
Kirkendoll, Kenneth J., T/Sgt.
Klein, Joseph R., Maj.
Klekar, Howard R., Lt.
Kline, Robert B., Cpl.
Knapp, James W., Lt.
Knapp, Robert D., Col.
Kocher, Joseph K., S/Sgt.
Kohl, George C., Jr., Lt.
Kohsiek, Donald J., Lt.
Kollinger, Robert E., Capt.
Kostelecky, William P., Pfc.
Kouski, Alexander, T/Sgt.
Kowalski, Walter F., Cpl.
Krause, Lester L., Jr., Capt. (& OLC)
Krebs, Robert N., S/Sgt.
Krigbaum, Oscar W., T/Sgt.
Kruetzer, Daniel J., S/Sgt.
Krzywicki, Witold I., Lt.
Kuhl, Otto F., Lt.
Kunkel, David E., Jr., Maj.
Kurz, Clarence J., Lt.
Labreche, George J., Maj.
La Casse, Leo A., Lt.
Lacey, Julius K., Col.
Lackey, John H., Jr., Maj.
Lakas, George S., S/Sgt.
Lambert, John L., Maj.
Lampe, Marcellius A., Cpl.
Landers, Clyde T., S/Sgt.
Lang, James H., S/Sgt.
Langley, Robert B., Lt.
Lanphier, Thomas G., Jr., Lt. (& OLC)
Larosh, Carl E., Sgt.
Larson, Aleron H., Lt.
Lausman, Carl C., Maj.
La Valle, Paul P., Cpl.
Lavers, Jack W., Capt.
Lawrence, B. R., Jr., Lt. Col.
Lawrence, Irvin H., S/Sgt.
Lawter, Charles M., Lt.
Layn, Roger W., Lt.
Leaman, Alton D., T/Sgt.
Lear, Dean E., Lt.
Lebrecht, Royden L., Capt.
Ledoux, Elzia, Maj.
*Lee, Walter S., Lt.
Leigh, Wallace E., Sgt.
Lent, Ray A., S/Sgt.
Leonard, Frank M., S/Sgt.
Leonard, Harold D., S/Sgt.
Leonard, Joseph G., S/Sgt.
Levine, Robert, Maj.
Lewis, Glen, Jr., Lt.
Lewis, Jess H., T/Sgt.
Lewis, John L., Lt.
Lewis, Murry L., Lt.
Lilley, Robert F., Sgt.
Lindgren, Edgar M., Lt.
Livesey, William F., F/O
Lochridge, John T., Lt.
Lockhorn, William A., Lt.
Lohse, Lester J., Maj.
Long, Robert E., Jr., S/Sgt.
Long, William B., Lt.
Longacre, Earl, Jr., Capt.
Lore, James A., Lt.
*Lovett, Joseph S., Lt.
Lowe, David C., Jr., T/Sgt.
Lozenski, Charles B., S/Sgt.
Lucien, Walter J., Capt.
Lunardelli, Edward E., S/Sgt.
Lunger, Lloyd G., Lt.
Lyle, Lewis E., Maj.
Lyons, James T., Lt.
Macdonald, Henry G., Capt.
MacFarland, Robert I., Lt.
Maddock, Jack E., Cpl.
Madison, Willard R., Sgt.
Magala, Leonard R., T/Sgt.
*Magness, Thomas M., Lt.
Maher, George T., Lt.
Mahoney, Philip M., Lt.
Maitland, Lester B., Col.
Mancini, Armando B., Cpl.
Manierre, Ernest R., Maj.
Manning, John D., T/Sgt.
Mannion, John T., Pfc.
Mansell, Morris E., Jr., Capt.
Manuel, Victor H., S/Sgt.
Marcan, Donald G., Capt.
*Marich, Nicholas, Lt.
Marion, Howard E., Lt.
Marlatt, Wilmot R., Lt.
Martin, John H., Jr., S/Sgt.
Martine, Loule E., Pvt. (& OLC)
Marts, Boyd J., M/Sgt.
Marvel, Charles E., Sgt.
Maslanka, Stanley F., S/Sgt.
Mason, Albert L., Lt.
Massie, Harold L., Lt.
Massie, Julian B., Jr., Lt.
Massing, Daniel G., Lt.
Matisoff, Jack L., S/Sgt.
Matthews, Ralph D., Capt.
Maul, Dwight E., Lt.
Maupin, Warren B., Pfc.
Maury, Dale W., S/Sgt.
Mayer, Max H., Lt.
Mayo, Charley H., Capt.
Mazzaferro, Joseph R., Sgt.
Meade, Augustus, S/Sgt.
Mears, William G., Sgt.
Meehan, John J., T/Sgt. (& OLC)
Meints, Harry S., Lt.
Melbraaten, Harold E., Lt.
Melman, Milton, S/Sgt.
Meneczkowski, John M., Lt.
Mercer, Gem H., Sgt.
Merrell, Charles T., Capt.
Messer, Jennings B., Cpl.
Meyer, Kenneth V., T/Sgt.
Miciak, Carl M., T/Sgt.
Middlebrook, Garrett, Lt.
*Middleton, Robert T., Sgt.
Miles, Joe D., Maj.
Miley, Carl H., Capt.
Miller, Loring Corwin, S/Sgt.
Miller, Louis I., Lt.
Miller, Robert F., Lt.
Miller, William A., Lt. Col. (& OLC)
Mills, Styles N., T/Sgt.
Mills, William C., Col.
Milton, Theodore R., Lt. Col.
Minton, Lewis T., T/Sgt.
Mirock, George C., Lt.
Mitchell, Edward R., Lt.
Mitchell, Kirk R., Maj.
Mitchell, Robert N., T/Sgt.
Moffett, Everett L., Lt.
Moffitt, Thomas A., Cpl.
Moisan, John J., Lt.
Molser, Hjalmer L., Cpl.

(Continued on Page 56)

To airmen flying in the sub-stratosphere, Rabaul harbor looks like this on a reasonably clear day. Lakunai airdrome, one of the five airfields concentrated in the Rabaul area, may be seen at the lower right.

This picture was taken following an air attack on the airdromes and harbor installations. Shipping in the harbor at the time the picture was made consisted principally of small barges and coastwise craft.

BLOCKING RABAUL BY AIR

By Capt. Lawrence P. Bachmann

AIR FORCE Overseas Staff

MEN in the operations rooms and command posts looked at the line-up and knew that by the end of the day Rabaul would no longer be of much use to the Japs. In chess, the game is won when the enemy is pinned down and held and cannot strike back. Today we were to make the check-mate move.

It was February 15, 1944. The line-up of airdromes at Rabaul was chalked up in operations rooms throughout the Solomon Islands.

Lakunai and Vunakanau seemed, from reconnaissance reports, to be the Japs' two best fields. Although they had received terrific pounding, the Japs had repaired them well. The Japs were using the other fields—Tobera, Rapopo and Keravat—principally for emergencies.

Today these five airfields were to be cut to pieces and struck again and again from shorter ranges until there would be no airfields for the enemy's planes and no planes for his airfields. American troops would land on Green Islands, thus isolating Bougainville and the Solomons from supplies to the north and from Rabaul and giving air control in the area to the Allies.

The pattern was simple. The Japs must have known it as well as every admiral and general who planned it. The method had been demonstrated with success when planes of the Navy, the Marines, the Royal New Zealand Air Force and the 13th Air Force pounded the airdromes of Bougainville, Shortland and Buka into rubble. They destroyed systematically the enemy planes in the air as well as on the ground until no more opposition rose, and the only sign of the enemy was some ineffectual anti-aircraft fire.

Then the landing was made at Empress Augusta Bay where there was little Japanese resistance. The enemy was pushed back into the hills and left there. Remembering Guadalcanal and Munda where the Americans did not stop until all Japanese were killed, the enemy was puzzled by the tactics. He was puzzled until it was too late, for then he was trapped and desperate. He was driven away from the territory the Allies needed in Bougainville. A perimeter of troops in sufficient force was placed around him, and he was left there to rot, starve, kill himself or die in a futile charge on an Allied pillbox.

We have taken Bougainville areas desired for air operation. We have our air-

THE 13TH AIR FORCE

Organized largely from other AAF units which battered shipping lines from island bases in the South Pacific throughout 1942, the 13th Air Force was activated January 13, 1943. Its principal objectives from activation to June, 1943, were:

- To gain air supremacy over the central Solomons.
- To obtain ground and sea objectives in the central Solomons.
- To destroy enemy supply lines in the northern Solomons.

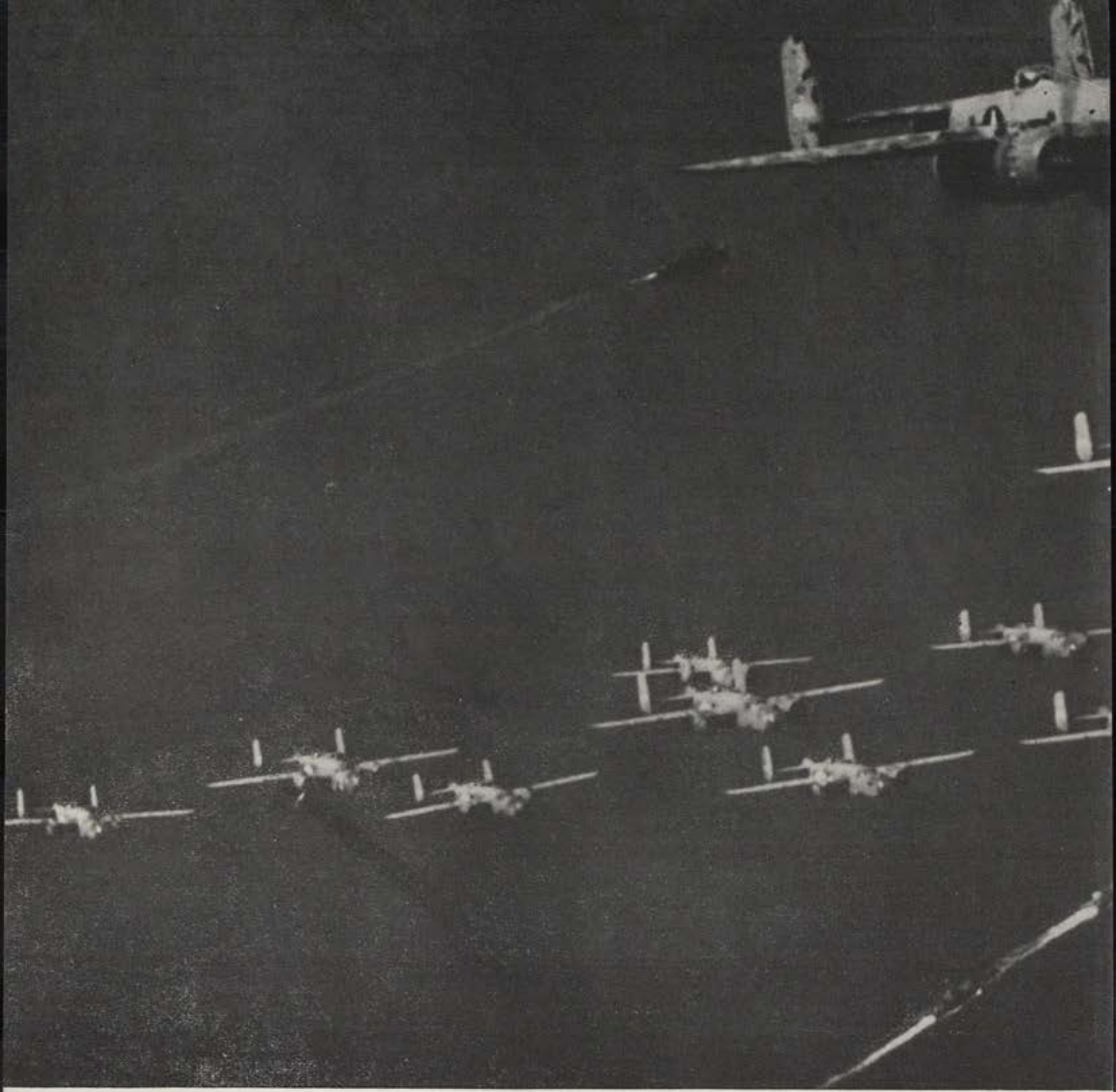
From June to December, 1943, its objectives:

- To neutralize enemy airfields and other installations on Bougainville.
- To support and protect amphibious objectives in the northern Solomons.
- To gain air supremacy over the northern Solomons.

From December to the present date, its objectives:

- Destruction of enemy airfields and other installations on New Britain.
- Destruction of enemy service supply lines over New Britain and the northern Solomons.
- Support of ground forces mopping up on Bougainville.
- Support of amphibious objectives out-flanking Rabaul.

The 13th's first headquarters was at Espiritu Santo, later in New Caledonia and now on Guadalcanal.

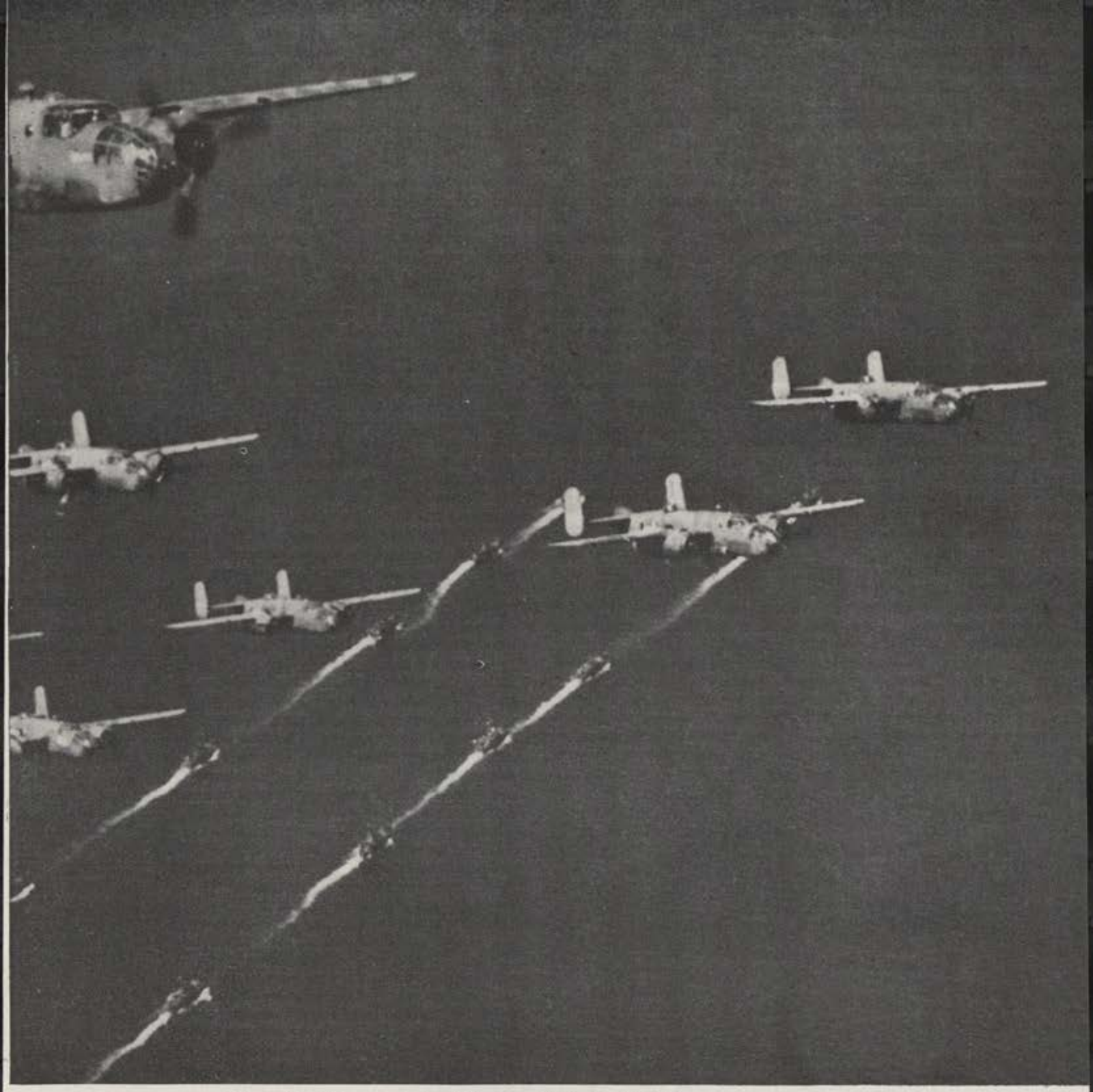


It's D-day in the South Pacific and this photograph depicts a momentary junction of American air and sea forces on the move. The B-25s are headed for Rabaul to blast Jap airdromes while the

fields and as good a harbor as we want. Our pattern for warfare in the South Pacific means many things. It means that the enemy is being knocked off balance. He planned on a slow war of attrition. He's getting a fast-moving war of position and movement. We select the spot we want, move in and take it, establish airbases and are set to move again. Mopping-up operations may be going on months after we have taken an island; meanwhile, we have knifed farther into the Jap's zones.

This is all upsetting to the Japs. Each one of their soldiers is determined to kill one or more Allied soldiers or Marines before he dies in combat for his emperor. He is doomed to disappointment and, furthermore, he is confronted with the most horrible of all fates for the Japanese: losing face. He is being cut off from supplies and is dying from starvation and disease. In this type of warfare air power has again demonstrated what it can do.

We saw this type of operation work when we built an airbase on the Jap-held island of Bougainville without the expenditure in men, resources and time which would have been required to take



Invasion convoy, several thousand feet below, speeds toward the Green Islands. Captain Bachmann, AIR FORCE staff correspondent in the South Pacific, snapped this picture from one of the bombers.

the island by direct assault. Although fighting went on in the island, it was mainly the stamping out of a trapped and enraged enemy. His forces could get no larger; ours could. He could get no supplies; we could.

The same sort of tactics was to be used in immobilizing Rabaul.

In the Solomons operations in August, 247 enemy aircraft were destroyed; in September, 171; in October, 173. The enemy was making a determined effort to hold the Solomons—as a shield for Rabaul and the way to the north, to the Philippines and to Japan. Then in November we moved against Treasury and Bougainville Islands. That month 300 Japanese planes were destroyed.

Day-by-day figures show that the Japanese resist an initial drive until the tactical situation or *loss of airplanes* makes further resistance in force no longer feasible. In the first eleven days of November, 255 planes were knocked down. Yet from November 12 until the middle of December when we were consolidating our positions in building airfields, only fifty Jap planes were destroyed. They simply did not have any more airplanes to throw at us. *(Continued on Next Page)*

In this drive to clear the Solomons the Japanese could not get their freighters through the narrow passages of the islands and they were forced to use barges and set up new, inefficient sea routes to run supplies to their troops based first on New Georgia, then on Vella Lavella, Santa Isabel, Kolombangara and Choiseul. Our B-25s and PT boats kept hammering at the barge lines.

The Japanese knew what was happening and didn't like it. Their Domei News Service told their people in December:

"The fact is that the enemy has advanced since Guadalcanal into Rendova, New Georgia and Bougainville. The means of their advances are always identical; employing a mass of carriers, they land under the cover of bombing and naval bombardments. Then they build airfields, thus extending the sphere of air influence on toward the north. It seems the opponents are making every effort to build airfields and to prepare numbers of aircraft. As the enemies themselves say, the advance is very difficult, and apparently they don't rely much on advance over land. Building up airbases there, their operations are to intercept our supply lines.

"Whenever the enemies build an airbase on an island, our communications and supply with the other islands becomes difficult. This is the characteristic phase of the war happening in this area surrounded by water and islands. The condition is that without roads, the communications along the coast depend upon small vessels. The forces cannot rush headlong into the landing point. Thus, even though we have great naval victories, they thread their way through the lines to land and gain footholds. Therefore destroying the enemy supply line is most important . . . to do this it is necessary to have supremacy over the air and sea.

"This is the way the Americans operate. They attack us, relying on unlimited numbers of aircraft. Even though we drive them away in the air battles, as the nature of aircraft requires, our planes cannot stay up in the air beyond a limited time; so we have to return to the base. Therefore, we can hold air supremacy only a short while in a day and after that the enemy's fresh aircraft will dominate the air . . . They repeat the attacks in waves. Two or three hours after the first attacker has withdrawn, they come back with more and renewed strength. They repeat this operation. At first we can detect their appearance and take off our aircraft to intercept and battle it out in the air, but as fuel and munitions run out we have to land our craft. At that time if the enemy renews the attack on us the battle will become very unfavorable to our side.

"Meanwhile the enemy reconnaissance planes will fly over us and report the 'splendid target' by radio to the forces waiting at the base and call tens of hundreds of aircraft. Then comes the swarm of enemy aircraft upon us. This is an everyday occurrence in the southern region. Consequently, as a general staff officer of the Expeditionary Army in the South Seas said, 'We have the opportunities, but not the planes.' We are facing the pathetic condition of not having enough aircraft to encounter them, though we had the chances to do so. . . . Our soldiers since Guadalcanal are experiencing the mortified feeling of being evacuated to another point though they are not actually defeated. As the result of the experience they encountered in that region, soldiers are saying, 'What on earth has happened to Japanese air power? . . .'"

WE know what has happened to it.

We also know how our air units are flying together. New Zealanders furnish fighter cover for Navy TBFs and SBDs. Marine and Navy 4FUs and Corsairs furnish medium and low cover for 13th Air Force B-24s; the AAF's P-38s provide high cover, and B-25s might be covered by any one of a number of these combinations. Search missions are performed by Navy land-and-sea-based multi-engined planes, supplemented by the Royal New Zealand Air Force. Navy PBY-5s, known affectionately as Dumbos, stand by with a cover of AAF P-39s to rescue anyone who goes down at sea.

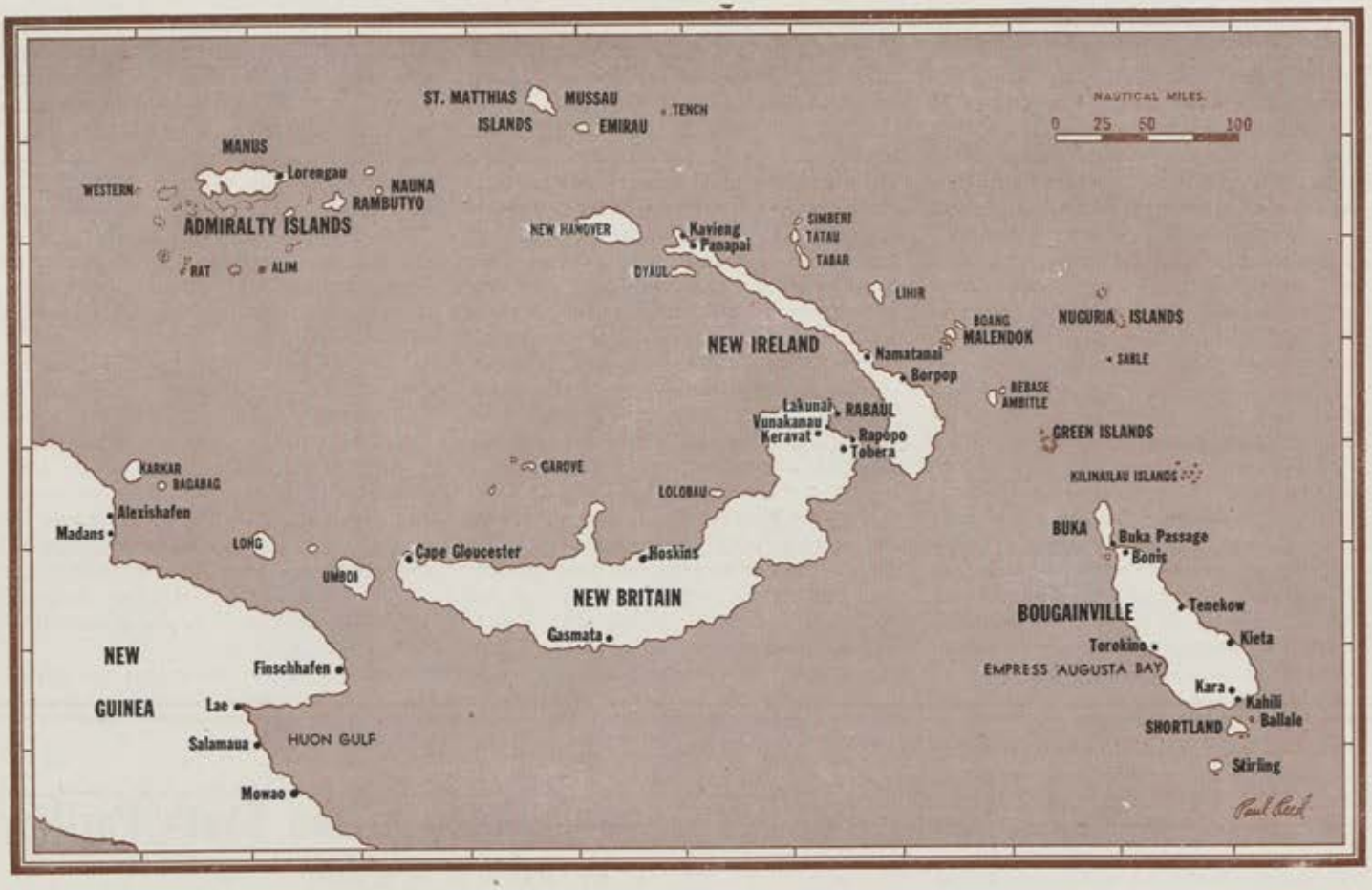
When we made the landing at Empress Augusta Bay on Bougainville on December 1, the Japanese did not have the use of a single airfield in the Solomons. The enemy worked desperately to repair the damage to their fields on the island but we kept them out of use.

Bomber crews of the 13th Air Force see to it that these fields stay unusable.

On December 19, full scale operations were started by the combined air arm of COMSOPAC. From new fields for fighters, dive bombers and mediums, Rabaul was under direct attack.

The airdromes which are the focal point of attack at Rabaul lie in a rough crescent shape about Simpson Harbor, which is inside a hook of land in northern New Britain. Rabaul, on the harbor, was formerly the commercial center and administrative headquarters of New Guinea Territory. Its prewar population was 836 Europeans and 12,000 Asiatics and natives. Its beautiful, natural harbor accommodates naval and merchant shipping of all sizes. Since January, 1942, Rabaul had been used by the Japs as their base of operations in the South Pacific and Southwest Pacific Theatres, but, because of our attacks, shipping in that port had been on the decline. Simpson Harbor had been struck steadily until it was of little use to the Japs. At one time, it looked like a thriving port with Japanese freighters and combat ships anchored inside the hook of land. By the

AAF bombs burst on Lakunai airdrome near Rabaul. The explosives have landed squarely on the runway and parking aprons. Existence of a large number of revetments and other permanent installations to accomodate bombers and fighters indicate enemy's high evaluation of the base.



time of the Green Islands invasion there was little left except hulks and crippled ships.

The airfields around Rabaul in order of importance are:

Lakunai, a mile south of the town was built originally for the RAF. Its importance is due to its proximity to the town and its status as the most heavily defended airdrome of the group.

Vunakanau is the best field and has the finest revetments and the most planes. It is as heavily defended as Lakunai but does not have the supporting anti-aircraft fire provided by the town installations. This airdrome is located eight miles south of Rabaul.

Tobera, principally a fighter field, is about thirteen miles southwest of Rabaul.

Rapopo, a bomber field, is sixteen miles southwest of the town.

Keravat, still in construction, has never been used except as an emergency and auxiliary field. It lies about twelve miles southwest of Rabaul.

The fields are connected by a net-work of good roads and the entire peninsula around the harbor is spotted with anti-aircraft batteries.

At the start of operations in the end of December, weather conditions were poor. There were plenty of targets, however, and when the airdromes were closed in we bombed the town's military installations and shipping. The harbor took so much punishment that no warships have been seen there since that time.

Two heavy strikes were made, however. The enemy fought back with intense and accurate anti-aircraft fire from ships and shore; aerial bombs were dropped and more than 100 fighters came up each time an attack was made. They bored in through our fighter cover to the B-24s and B-25s which, even so, gave a good account of themselves. The enemy followed the formations beyond Cape St. George, the southern tip of New Ireland.

On December 27 and 28 there were two fighter sweeps. In both jobs the Japanese were caught on the ground. Our fighters waited for the Japs to come up to them. The American tactics consisted in forming a large lufberry, with a high Navy Hellcat cover, and making diving passes at the more than sixty Japs who rose to intercept. After making a pass, a plane would climb back and rejoin the circle. These maneuvers paid off with a bag of 43 Japanese planes to a loss of four Navy Corsairs.

During the next week the weather still wasn't good, but our fighters still knocked down 89 enemy planes. The Allies were getting rid of the Japanese airplanes. The Japs continued sending up a lot of aircraft. They brought them in from the north, and as fast as they did we shot them down. For the Japs, it was like pouring water into a sieve.

Heavy bombers of the 13th Air Force broke through only three times in the early weeks of the campaign. On these raids, the Japanese sent up almost a hundred planes and their flak, for the most part, was intense and accurate.

The bombers really warmed up on January 8 and, for the next week, they hit an average of two airfields a day as well as making many attacks by night. Between 2211 of the 12th and 0335 of the 13th, B-24s showered frags and 500-pound bombs on Lukunai and Tobera; just before dawn B-25s followed up against Tobera, Rapopo and shipping in the outer harbor. Some TBFs made a run at the same time on merchant shipping in Simpson Harbor. There was no interception that day.

The battle began going to us between January 15 and 21. The Japanese could not replace their losses although they showed considerable ingenuity in keeping their operations fluid, moving planes quickly from one airdrome to another. We continued to shoot their planes down and bomb all five fields, switching from one to another, changing tactics and times of the attacks. At the end of day of January 21 the enemy had lost 208 planes over his own fields.

Good weather brought good action from January 22 to 28. The Japanese continually reinforced Rabaul, the keystone of their South Pacific defenses, and

their plane losses reached the average of 24 a day. Lakunai, the most heavily defended fighter field on the peninsula, was struck nearly twice a day. On January 25 the Japanese called time out.

Fifty-two of our fighters, stacked down from 29,000 to 23,000 feet, came in during the afternoon and circled Rabaul about five times. The formations dropped to 17,000 feet and circled around in a challenging manner. They finally called the Japanese on the radio in the clear and pleaded, a little profanely, for them to come up and fight.

"Come down here on the ground and make us," the Japanese replied in very good English.

RABAUL was "Munda-ized" so thoroughly in the week from January 29 to February 4 that the enemy couldn't even launch any reprisals against our fields on Bougainville although they were in easy range. Our fighter cover was a lovely thing and we didn't lose a bomber, although the Japanese sent up as many as 88 planes at one time. Five major strikes were made on the last two days of January. On February 4, the enemy, rather reluctantly, sent up only thirty planes when B-25s hit Tobera and B-24s hit Vunakanau at almost the same moment. The score for the month of January was 441 enemy planes shot down, not including those hit by carrier-based aircraft or shot down by our anti-aircraft batteries. On February 1 the commanding general of the South Pacific Forces received a message from General Marshall congratulating all air personnel on their destruction of Jap aircraft in the Solomons-New Britain area in the preceding ten days.

The strikes were stepped up in the week of February 5-11 to three a day. We got 91 planes and repeatedly put the Jap airfields out of commission. Coming into Rabaul, you could look out of the photographer's spot in a B-25, either the waist windows or the camera hatch and see Hamps and Zekes falling like burning pieces of paper and the field below being turned to gray rubble by the bombs you left. It was a powerful, sustained attack. The enemy fought back bitterly. Lakunai was hit with knock-down blows on the 5th, 6th, 7th and 9th, and the Japanese each time repaired the field and brought new planes in. As new Jap planes were spotted at any of the fields, we would make strafing and para-frag runs on them. We began to take over the air above Rabaul. On the 11th the enemy could put up only 75 fighters against 115 of ours.

The few days before the landing on the Green Islands were marked by the greatest air activity and the greatest display of pinpoint bombing yet seen in the South Pacific. On the 13th tons of bombs were dropped on Lakunai and only two failed to hit on the runways or revetments. Photographs the next day showed the oblong strip gone completely, almost as if somebody had erased it from the picture. The Japs painstakingly scraped the ground and made it level again.

Apparently the Lakunai fighters that were in the air during the blasting landed elsewhere, or maybe some new fighters came in from the north. At any rate, in late afternoon reconnaissance planes over Rabaul brought back photos which made the first PI officer to see them snatch up his phone and call headquarters. A number of fighter planes could be seen clearly in the revetments and aprons of Tobera.

The next morning, just before dawn, some B-25s moved in at tree-top height, wing-tip-to-wing-tip, and swept down the length of the runway and revetment area. Thirty men, repairing the battered runway, were mowed down. The planes on the aprons and revetments were shot up and burned. One machine gun on the ground sputtered unhappily at the Mitchells as they left. Later in the morning, a consolidated raid with every type of combat plane struck Vunakanau.

On D-day the enemy opposition on Rabaul had dwindled to forty fighters which rose when the B-25s came in again to knock out Vunakanau. The Jap planes went through all manner of lovely gyrations, and it was pleasant watching them from the camera hatch even if they didn't make very good pictures. They were long on acrobatics and short on fighting that day, although enough of them finally did fight for us to knock down nine. Even the flak was half-hearted and inaccurate. Meanwhile an umbrella of fighters was covering the landing on Green Islands, a short 150 miles away.

The task force finished shelling Nissan, the main island; the landing boats ran up to shore. Jap resistance was light and it was mopped up quickly. Men began surveying the place for airfield sites. From there, Rabaul would be contained from then on, and plans were made for striking north, by-passing the immobilized Jap base, once the most important in the South Pacific. Twenty thousand Japanese were cut off to die of starvation, disease and gunshot wounds.

Meanwhile, our reconnaissance planes had been busy over more advanced areas. We were on the move—fast. ☆

Bomber Crew Training in the South Pacific

By Lieut. Col. H. E. Jones

13th Air Force

THE function of the thirty-day course which is given to all bomber crews when they arrive in the South Pacific is to indoctrinate the men, giving them a type of training which they could not possibly get in the United States, and to cover up any possible discrepancies in their previous training. We have opened such a school through necessity, for we have learned that between 75 to 80 percent of our operational losses occur with crews that have been here less than three months. That means only one thing—inadequate training for the type flying demanded in the South Pacific.

On arrival the men are sorely disappointed when they can't go immediately into combat. They naturally have a tendency to resent any further training. No amount of figures, statistics or talk will firmly convince these men that they are not ready to engage the enemy. So we prove it to them. We give them some tests. They are simple and thorough examinations without any trick questions or situations. The tests are operational as well as written. We might flight check a bombardier and see if he can get his bombs away in the brief time we are over a target in this theatre. Or we might ask a pilot to set a plane down on a strange field, or run a long mission and see if the engineer understands the right time and the correct procedure in transferring fuel. If a man should pass the tests then we would readily concede that he needs no further training. To date no one has passed them.

This in no way should reflect upon the training methods in the States for a number of questions deal directly with operations and procedures in this theatre—information that no training school at home can be expected to provide, yet information that every man needs if he is to fly in the South Pacific. The attitude of the men changes after taking the examination and they get down to work.

Everything possible is done to make the school as interesting and as practical as possible. This is relatively easy. For instructors we use experienced crew members who have flown their allotted number of missions but who have volunteered to remain here to instruct the new men of the 13th Air Force. These men generally make fine instructors for they can sprinkle the lectures and flights with their own experiences, and they know the theatre backward and forward. The students, of necessity, listen to these men with respect. All manner of training aids that are particularly pertinent to this theatre are used. Complete operational mock-ups of the exact type of plane the crew will be operating are furnished. Classrooms are well lighted and ventilated and the study or intelligence war room is filled with all

manner of the latest technical books and pamphlets, as well as daily intelligence reports, so that the men can familiarize themselves quickly with all aspects of operations of this area. They can confirm the reports by the large tactical maps on the walls which are marked up daily to show strikes and other action.

During the month's course the men receive 120 hours of ground school and 90 hours of flying training. This represents seven hours of work a day. Naturally the navigators get more navigation than other crew members, but all receive some of the same lectures so that they will be familiar with each other's work.

Roughly the ground course breaks down as follows:

Fifteen hours of intelligence for all crew members. This course includes target identification, knowledge of the enemy, safety factors, how to live in the jungle and on a life raft, and the type of information needed by the intelligence officer after each mission.

Ten hours of Renshaw system of plane recognition for all men. Now and then men trained for the European theatre arrive here with a full knowledge of Nazi planes but none of the Jap aircraft.

Three hours' work for all men on range estimation.

The 3A2 Trainer is used with modification. We use turrets that have been removed from a plane. Gunners get fifteen hours of this training; the rest of the crew, ten hours.

Navigation is most important in this theatre for so much flying is done over water out of sight of landmarks. In addition, the weather is always changing and the men must know how to orient themselves quickly. Pilots and bombardiers get eight hours of basic navigation; gunners one hour in life boat navigation, and navigators have a 26-hour course. This work includes problems taken from the log books of actual mission. We also teach the navigators a number of unorthodox tricks which we have developed here through experience.

All men take the eight-hour ordnance course, including safety factors in handling bombs and fuzes.

Aviation medicine is another eight-hour course for all flyers. It deals primarily with first aid and oxygen equipment.

Weather study is treated in six hours for pilots, navigators and bombardiers. They learn the use of weather codes, how to get weather from the radio stations, the peculiarities of weather in this area. The only other crew member taking this instruction is the radio operator, who gets two hours dealing mainly with sending and receiving weather data.

Chemical warfare is a four-hour brush-up course for all men. It includes the use of incendiary bombs and smoke screens.

The armament course provides an opportunity for every member of the crew to check out on every gun and turret. This is done in eight hours by the pilots, navigators and bombardiers. The radio operators and engineers get twelve hours, while the gunners who must know the exact workings of all turrets and guns get sixteen hours.

The engineering course emphasizes emergency procedure for all crew members, including instruction in such subjects as fuel transfer and the emergency hydraulic procedures. Pilots get sixteen hours; navigators, bombardiers and radio operators five hours; gunners 29 hours, and engineers 36 hours, including 26 hours of actual work on the line.

Bomb training is given in five hours to all officers but the bombardier gets ten hours. This is to familiarize others with the bombardier's problems and enable them to take his place in an emergency.

FOUR hours of radio electronics instruction is given to pilots and navigators to familiarize them in its use as an aid to navigation and as a homing device. Radio operators get twelve hours to familiarize them in its operation and maintenance.

Code blinker is given to all men until such time as they can check out at five words per minute. This permits communication between planes in flight as well as in emergencies where the men might be in a life raft or on some island.

The air training period is for all crew members, stressing their particular job during the following operations;

Day formation assembly and landing procedure, four hours; night formation assembly and landing procedure, six hours; formation ascent, descent and frontal penetration (going through weather safely in formation), four hours; high altitude formation flying over 20,000 feet, eight hours.

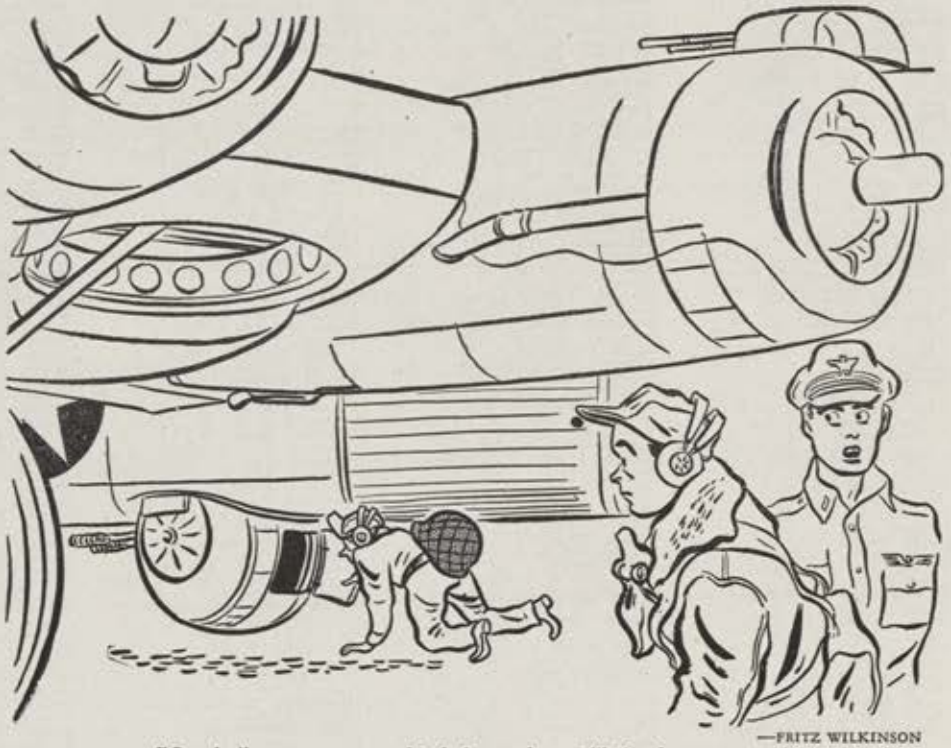
Bombing covers a combined period of 24 hours. The men can always stand more practice in this most vital of all functions. More than that, it determines the best men to use in the lead planes for formation bombing. It also teaches the men our bombing tactics on the different type targets with which we have to deal.

Ten hours of instrument instruction are designed to familiarize the men with the beams used here. This includes six hours of letdown procedures for bad weather and night flying.

Navigation is divided into two equal periods of twelve hours each for day and celestial navigation. We put two students in a plane—one in the nose and the other in the flight deck. They have a number of practical problems, such as navigating the plane out to a reef about 550 miles out and then returning to another reef that is near home but far enough away so no landmarks can be used.

There is a ten-hour course for co-pilot transition. All of our co-pilots are checked out as pilots. The necessity for this is obvious—the pilot might be shot up and the co-pilot must take his place. For that reason we stress emergency landings since it stands to reason that if the pilot is hit, chances are the plane is damaged and a trick landing will be necessary.

That our system is successful is borne out by the fact that our losses are as low as those of any Air Force. And we aim to make them even lower. ☆



—FRITZ WILKINSON

"Our belly gunner wears his helmet where it'll do the most good!"

Roll of Honor

A MONTHLY RECORD OF DECORATIONS AWARDED TO PERSONNEL OF THE ARMY AIR FORCES

(Continued from Page 48)

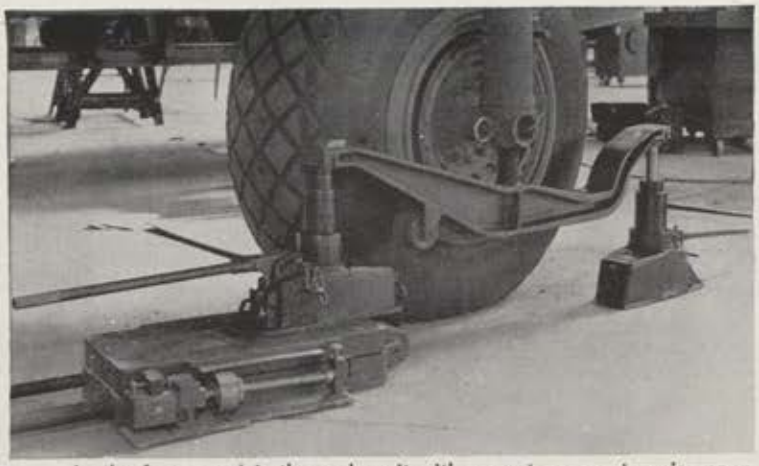
Monday, Robert E., T/Sgt.
Money, Owen, Jr., Sgt.
Monroe, Irving A., Lt.
Montagano, Edmund D., Lt.
Mooney, Robert H., Lt.
Moore, Ballinger B., Lt.
Moore, Cecil L., F/O
Moore, Ernest W., Lt.
Moore, Howard W., Maj.
Moore, Joseph H., Capt.
Moore, Richard D., Lt.
Moore, Thomas H., Cpl.
Moore, Woodrow W., Lt.
Morgan, Herbert H., Cpl.
Morgan, William E., T/Sgt.
Morley, Myrvan R., T/Sgt.
Mormon, Frank M., S/Sgt.
Morris, Emmett L., Lt.
Morrissey, Raymond A., Lt. (& OLC)
Moseley, Jack C., Sgt.
Moseley, Ralph H., Lt.
Murphree, Clyde E., Lt.
Murphy, Daniel S., S/Sgt.
Murphy, James L., S/Sgt.
Murphy, James T., Lt.
Murphy, John P., Lt.
Murphy, William C., Lt.
Murray, Joseph F., Sgt.
Murrey, John S., Capt.
Myers, Joseph A., Sgt.
Myers, William C., Cpl.
McAtee, James C., Lt.
*McBroom, Vernon, Sgt.
McCabe, Robert R., S/Sgt.
*McCalmont, Howard V., T/Sgt.
McCandless, George, Jr., Lt.
McCane, George A., Lt.
McCarty, Ned, Lt.
McCauley, Frank E., Lt.
McClaran, Clarence E., Lt.
McClellan, W. E., Jr., Lt.
McCollom, Loren G., Lt. Col.
McComb, William J., Lt.
McConnell, Robert B., Lt.
McCord, Louis D., Capt.
McCormic, Leslie C., S/Sgt.
McCormick, John B., Lt.
McCrory, Marvin L., Lt.
McCullen, John B., T/Sgt.
McCullough, John H., Capt.
McDonald, William B., Lt.
McDonough, William F., Lt.
McDowell, Francis G., Lt.
McFann, H. Miles, Lt.
McGee, Jesse B., S/Sgt.
McGuire, Russell E., S/Sgt.
McHugh, James T., Cpl.
McKinley, Daniel A., T/Sgt.
McMillan, Clinton, Jr., Lt.
McMillin, Langley Seldon, Maj.
*McNaughton, Edwin B., Jr., Cpl.
McNeil, William H., Lt.
McNown, William K., Col.
McWilliams, R. N., Jr., Capt.
Nakoneczny, William E., T/Sgt.
Nance, William E., S/Sgt.
Nazzaro, Joseph J., Col.
Necrason, Conrad F., Col.
Neef, Malvin E., Lt.
Neener, Elwood H., Jr., S/Sgt.
Neese, Oliver R., S/Sgt.
Neilson, Douglas A., Lt.
Nelson, Marshall E., Capt.
Nelson, Robert E., Capt.
Nelson, William M., Sgt.
Nemnemann, Ernest B., Capt.
Nesevitch, Michael, S/Sgt.
*Neuman, George N., Cpl.
Nevill, Clarence A., T/Sgt.
Newell, S. P., S/Sgt.
Newport, Louis H., Lt.
Newton, George L., Lt.
Nygard, Leonard R., Sgt.
Nichols, Edgar S., S/Sgt.
Nichols, Franklin A., Capt.
Nicholson, Leonard T., Lt.
Niemi, Edward V., T/Sgt.
Nies, Albert C., S/Sgt.
Nilsson, Roy I., T/Sgt.
Nisbet, Stewart D., Sgt.
North, Alexander F., Lt.
Nunn, Leslie C., T/Sgt.
Nye, Glenn C., Col.
O'Brien, James A., S/Sgt.
O'Brien, William E., Lt.
Ochala, Carl A., S/Sgt.
Old, Archie J., Jr., Col.
Oliver, James F., S/Sgt.
Olsen, Harold F., Lt.
*Olsen, Roy W., Capt.
Olson, Oscar D., Lt.
Olson, Paul V., Lt.
O'Neill, John G., Lt.
Ostrander, Robert E., Lt.
O'Sullivan, Donald R., Capt.
Otterpohl, Robert B., S/Sgt.
Overholser, John W., Sgt.
Owens, Laurel J., Lt.
Pacassi, Jerry G., F/O
Pacheco, Joe B., S/Sgt.
Padgett, James W., Jr., Lt.
Palm, John D., Lt.
Palmer, Andrew L., F/O
Palmer, John A., Lt.
Papp, Joseph, S/Sgt. *(& OLC)
Paquin, Howard M., Capt.
Parsons, Jay B., T/Sgt.
Pate, James E., Capt.
*Patrize, David D., Sgt.
Patterson, Arnold M., Lt.
Patteson, Harry O., Lt.
Patton, Charles R., Lt.
Patton, Richard L., Sgt.
Paulsen, Paul H., Pvt.
Payne, John B., Jr., Lt.
Payne, Pace P., S/Sgt.
Paz, Michael J., S/Sgt. *(& 2 OLC)
Pearson, John T., S/Sgt.
Peaselee, Budd J., Col.
Peattie, Francis G., Lt.
Peebles, Robert M., Lt.
Pendergast, Thomas E., T/Sgt.
Penney, Edgar G., Lt.
Pennington, Morris E., S/Sgt.
Pierce, Harold R., Sgt. (& OLC)
Pierce, Robert G., S/Sgt.
Pierce, Sammy A., F/O
Pirruccello, Joseph S., Maj.
Pittenger, Donald D., S/Sgt. (& OLC)
Poland, Harold H., Pvt. (& OLC)
Porter, James M., S/Sgt.
Potts, Ramsay D., Jr., Maj. (& OLC)
Powell, James, Lt. (& OLC)
Powell, John E., Lt.
Powers, Macarthur, Lt.
Praun, Robert, Lt.
Prentiss, Paul H., Col.
Preston, Joseph J., Lt. Col.
Preston, Maurice A., Col.
Pringle, Ralph K., Lt.
Pugh, Herbert W., Cpl.
Purnell, Fred V., Capt.
Quick, Quentin T., Lt. Col.
Quigley, Edward C., Lt.
Quillen, Raymond, S/Sgt.
Rachel, James B., Lt.
*Rafferty, Robert C., Cpl.
Raher, Donald J., Cpl.
Raines, Lewis D., Lt.
*Ramaker, Judson S., Lt.
Raming, Herman P., Cpl.
Ramirez, Benjamin, S/Sgt.
Ramsey, Homer B., T/Sgt.
Ramsey, Robert H., S/Sgt.
Rantala, Archibald J., Lt.
Rapasky, Bernard W., Lt.
Raper, William S., Maj.
Rautio, Frank I., S/Sgt.
Ravey, Robert E., S/Sgt.
Ray, Wilbur R., Capt.
Ready, William D., Maj.
Reagh, Grant L., Lt.
Rebich, George, Capt.
Reed, Wiley C., S/Sgt.
Reeves, Vernon H., Lt. (& OLC)
Refsguard, James M., T/Sgt.
Regan, James R., Lt.
Reid, William M., Col.
Reindl, Frank J., T/Sgt.
Reiners, George H., T/Sgt.
Remillard, Owen C., T/Sgt.
Renick, Reed, S/Sgt.
Reser, Charles S., S/Sgt. (& OLC)
Reynolds, O'Neal S., Sgt.
Richards, Harlan H., S/Sgt.
Riddle, Cecil E., Lt.
Riley, Robert W., Capt.
Ritenour, Arthur B., S/Sgt.
Rivers, Walter J., Lt.
Rizzo, Anthony F., Sgt.
Roberson, Rupert P., T/Sgt.
Roberts, Eugene P., Maj.
Roberts, John A., Lt. Col. (& OLC)
*Roberts, Phillip W., Capt.
Robertson, Nubron L., Lt.
Robinson, George L., Lt. Col.
Rogers, Arthur H., Col.
Rogers, Edward D., S/Sgt.
Rogers, John D., T/Sgt.
Romig, Eugene A., Lt. Col.
Roper, Hugh R., Capt.
Rosenberger, John W., T/Sgt.
Rosengarten, Earl M., S/Sgt.
Rothstein, Abraham, Cpl. (& OLC)
Roubique, Francis B., Jr., Lt.
Rousek, Jay P., Maj.
Rowton, Joshua E., T/Sgt.
Rozow, Daniel, S/Sgt.
Rudden, William R., Lt.
Russell, Donald D., Pvt.
Rutherford, James E., S/Sgt.
Sage, Lyle G., T/Sgt.
St. Pierre, Edmond J., S/Sgt.
Saltsman, Ralph H., Maj.
Sammons, James N., Capt.
Sampson, Forrest O., T/Sgt.
Sand, Ivan O., T/Sgt.
Sanders, Albert R., S/Sgt.
Sanders, James R., Lt.
Sanford, Raymond Pape, Lt.
Sarkisian, Dickran M., Jr., Lt.
Sarsfield, William J., Lt.
Sawyer, Jerome R., Capt.
Sayer, Maurice F., S/Sgt.
Scammel, Victor C., Lt.
Schaffer, Jack H., T/Sgt.
Schauweker, Orris W., T/Sgt.
Schimke, Robert S., Lt.
Schleh, Robert W., Lt.
Schley, John Dearing, Lt.
Schmalz, Richard A., Lt.
Schmidt, Budd R., S/Sgt.
Schneider, Edwin A., Lt. (& OLC)
Schneider, John E., F/O
Scholl, Walter, Jr., Lt.
Schooley, Roy L., Sgt.
Schulte, Alvin J., T/Sgt.
Schumacher, Richard P., Lt.
Schwane, Henry H., Maj.
Schweigert, Delmer M., S/Sgt.
Schwimmer, Charles L., Lt.
Scoggins, Max F., Cpl.
Scroggins, William A., Pfc.
Seals, Keith L., S/Sgt.
Sederberg, Robert S., Lt.
Seerley, John J., Maj.
Seidel, Francis L., Cpl.
Sekeres, Julius G., S/Sgt.
Selasky, Charles J., Lt.
Selling, Jack L., Lt.
Seltz, Clarence O., Lt.
Seper, John R., S/Sgt.
Sexton, Alfred E., M/Sgt.
Shafer, William E., S/Sgt.
Schaffer, Dale L., Capt.
Shaffer, George W., Capt.
Shako, George K., Jr., Lt.
Shapuras, Joseph, Sgt.
Sharpsteen, William C., Capt.
*Schauffler, William G., III, Lt.
Shea, William L., Lt.
Shearer, Alfred M., Jr., Lt.
Shelley, Gilman F., Lt.
Shepardson, Richard F., T/Sgt.
Sherline, Merwin J., Pfc.
Sickinger, Francis G., Lt.
Simon, John H., Cpl.
Simon, William C., Sgt.
Simpson, Howard J., Capt.
*Simpson, Jerome L., Lt.
Sinclair, John D., T/Sgt.
Singer, Donald M., Lt.
Singer, William S., Lt.
Skeadas, Lou G., S/Sgt.
Slack, Morris W., Capt.
Slocumb, Clyde B., Jr., Capt.
Slusarczyk, Julian W., S/Sgt.
Smathers, Oda A., T/Sgt.
Smith, Alan H., Lt.
Smith, Albert, Sgt.
Smith, Burton C., Lt.
Smith, Charles E., Lt.
Smith, Dale L., S/Sgt.
Smith, Delbert C., T/Sgt.
Smith, Donald M., Sgt.
*Smith, George J., S/Sgt.
Smith, George W., Cpl.
Smith, Luther E., F/O
Smith, Morris A., S/Sgt.
Smith, Richard H., Col.
Smith, Robert B., Lt. (& OLC)
Smith, Thomas J., Lt.
Smith, William A., Capt. (& 2 OLC)
Smith, William R., Pvt.
Snyder, Everett W., T/Sgt.
Solinsky, John, S/Sgt.
Solomon, Edward T., Lt.
Somers, Donald L., Pfc.
Somerville, Richard V., Lt.
Sopko, Clarence T., T/Sgt.
Sorensen, Karl L., M/Sgt.
Sowney, Frank C., Cpl.
Sparks, Claude R., Cpl.
Spencer, William R., Jr., Lt.
Spilde, Orval R., S/Sgt.
Spitznagle, Frank R., Lt.
Spotts, Guy H., Lt.
Sprague, Carl W., Lt.
Sprowls, Delmar V., S/Sgt.
Stanford, Harry H., Capt.
Stefanik, John Jacob, Lt.
Steinke, Frank G., S/Sgt.
Stephens, Bonny W., Cpl.
Stephens, Loonie A., T/Sgt.
Stephens, Robert O., Sgt.
Stern, Howard L., Lt.
Sterner, Lee R., T/Sgt.
Stevens, Kermit D., Lt. Col.
Stewart, Leslie A., Sgt. (& OLC)
Stewart, Walter T., Lt.
Stine, Robert J., Lt.
Stirwalt, Harry A., Capt.
*Stockton, Donald E., Capt.
Stoddard, Edward F., Maj.
*Stodghill, William B., Lt.
Stoerner, Julius A., Lt.
Stone, James J., Jr., Lt. Col.
Storrie, Carl R., Col.
Stout, Edward L., Lt.
*Stratton, Eldon E., Capt.
Strawn, Robert E., S/Sgt.
Strike, Clarence E., Sgt.
Stringfield, James P., Lt. (& OLC)
Stroeg, William H., Lt. (& OLC)
Strope, James W., S/Sgt.
Stroud, William P., Jr., Lt.
Stubblefield, Webb H., Lt.
*Stuckey, David W., Pvt.
Stuehmer, Lloyd A., Lt.
Sullivan, James H., Lt.
Sutliff, Don L., Lt.
Sutter, William A., Cpl.
Sutton, Lewis E., Lt. (& OLC)
Swan, Jack B., S/Sgt.
Swanson, Robert C., Sgt.
Swanson, Theodore B., Capt.
Sweeney, James S., S/Sgt.
*Sweetland, Theodore R., Capt.
Szabo, Ferenc J., S/Sgt.
Szabr, Jean J., Capt.
Szewyck, Mike, S/Sgt.
Tarbet, Dale F., Lt.
Tate, Joseph S., Jr., Maj.
Taylor, Harold A., T/Sgt.
Taylor, Lee R., Lt.
Taylor, Lloyd R., S/Sgt.
Taylor, Merrill E., Lt.
Terry, Henry W., Maj.
Thacker, Clarence L., Capt.
Thatcher, Herbert B., Col.
Theiss, William, S/Sgt.
Thiessen, Ralph A., Lt.
Thomas, David J., Pfc.
Thomas, Eugene M., Lt.
Thomas, Herbert C., Capt.
Thomas, Ralph H., Sgt.
Thomas, Tom A., Lt.
Thompson, Arnold M., T/Sgt.
Thompson, Donald V., Lt.
Thompson, Fred E., Capt.
Thompson, Jack G., Lt.
Thompson, John K., Lt.
Thompson, Loren E., Lt.
Thompson, Paul W., F/O
Thompson, Paul W., Cpl.
Thompson, Richard S., Lt.
Thompson, Rodney S., Lt.
Thompson, Thomas M., Lt.
Thompson, Walter B., Lt.
Thompson, William M., Jr., Capt.
Thompson, William R., Lt.
Thornhill, Dale J., Maj.
Thornhill, John J., Capt.
Thues, Emil F., T/Sgt.
Titus, Calvin P., Lt.
Topping, John C., Lt.
Tosch, Robert W., Lt.
Travis, James L., Lt. Col.
Trimingham, Charles E., Lt.
Troccia, Edmond C., Lt.
Turick, Henry H., Lt.
Turner, Claude A., Lt.
Turner, Eugene V., Sgt.
Turner, Richard H., Lt.
Turner, William L., Capt.
Turnock, William K., S/Sgt.
Turrentine, N. D., S/Sgt.
Tyson, Ashbrooke W., Lt.
Unruh, Marion D., Lt. Col.
Updaw, Frank E., T/Sgt.
Upthegrove, Fay R., Col.
*Vaccare, Cecil N., Lt.
Vandenberg, Hoyt S., Brig. Gen.
Vanderslice, H. R., Jr., Lt.
Vanek, Emil F., S/Sgt.
Van Hooser, Vance W., S/Sgt.
Vargas, Roger, Lt.
Vaslow, Charles, Cpl.
Vaughan, William, Cpl.
Vaughan, Clyde C., Lt.
Venable, Douglas R., Jr., Lt.
Vicente, Manuel E., Lt.
Vickers, Alfred J., S/Sgt.
Vickery, Clyde W., Lt.
Villanueva, Jenaro, Cpl.
Vinmans, Paul H., T/Sgt.
Vedra, Richard J., Lt.
Vokoun, Amiel, S/Sgt.
Venarx, Leonard L., S/Sgt.
Voorhees, Irving W., Jr., Lt.
Wagner, John F., S/Sgt.
Wahl, Conrad W., S/Sgt.
Walbrun, Leo, S/Sgt.
Walker, Neil E., Maj.
Wall, Hatton T., Lt.
Wallace, David W., Lt. Col.
Wallace, Eugene D., Lt.
Wangeman, Herbert O., Lt. Col.
Ward, Willard L., S/Sgt.
Wardle, Richard J., Lt.
Watson, Robert F., S/Sgt.
Watson, William H., Lt.
Weatherly, Edison, Lt.
Weaver, Stanley C., Sgt.
Webb, Paul G., S/Sgt.
Webster, William H., Jr., Capt.
Weichlein, George V., Lt.
Weimer, Elton E., S/Sgt.
Weinberg, Albert E., Lt.
Weisegerber, Adam F., S/Sgt.
Weitz, Arthur, Sgt.
Wells, Charles P., F/O
Wells, William B., Lt.
Weltman, John W., Lt. Col.
Westbrook, Robert B., Lt. (& 2 OLC)
Wexler, Haskell, Lt. (& OLC)
Wheeler, Herman C. T/Sgt.
Wheeler, Joe D., Capt.
White, Alpheus W., Jr., Maj.
White, Robert H., Capt.
Whitener, Cecil J., Lt.
Whiting, James G., Lt.
Whitley, George W., Jr., S/Sgt.
Whitley, Lloyd E., Capt.
Whitlock, Charles P., Capt.
Whittaker, Roy E., Capt.
Wicklund, Harold A., Capt.
Widener, Robert B., Lt.
Widmann, Benjamin, Lt.
Wiggans, Fred, Sgt.
Wilcox, Gordon F., Lt.
Wilcox, William W., Maj.
Wilder, Alan W., Maj.
Wilhite, David L., Lt.
Willcoxon, John B., Lt.
Williams, Churchill T., Lt.
Williams, Edd P., Sgt.
William, George V., Capt.
Williams, Henry E., T/Sgt.
Williams, John R., Lt.
Wilson, Earl H., Lt.
Wilson, Harvey A., Lt.
Wilson, Jack R., Capt.
Wilson, James W., Lt. Col.
Wilson, John R., Lt.
Wilson, Rollie C., S/Sgt.
Wilson, Sam H., M/Sgt.
*Wilson, Walter W., Sgt.
Wimberly, Olin J., Lt.
Wintrey, Hal C., Lt.
Winter, Douglas L., Lt.
Wofford, James E., Sgt.
Wolenski, Stanley A., Sgt.
Wolf, Francis W., S/Sgt.
Wolf, Leonard, T/Sgt.
Wolf, Robert R., S/Sgt.
Wolverton, Marvin B., S/Sgt.
Wood, John E., Lt.
Woods, Kenneth D., T/Sgt.
Woods, Sidney S., Maj.
Wooley, Carey J., Jr., Lt.
Worley, Homer, Jr., Lt.
Woziak, Leonard J., S/Sgt.
Wright, Donald G., S/Sgt.
Wright, Ellis W., Jr., Capt.
Wright, Forrest D., T/Sgt.
Wright, Robert L., Lt.
Wurtsmith, Paul B., Brig. Gen.
Wurzbach, Clemens K., Maj. (& OLC)
Wyland, Dean L., T/Sgt.
Wythers, Keith W., Lt.
Yaeger, Robert R., Jr., Lt.
Yancey, Don M., F/O
*Yarborough, John R., Lt.
Yeager, William H., Jr., Maj.
Yeck, Robert K., Lt.
Yeomans, Harold W., S/Sgt. (& OLC)
Young, Ernest C., Lt. Col.
Young, J. B., M/Sgt.
Young, James N., Sgt.
*Zalic, John P., Sgt.
Zawadski, Walter J., S/Sgt.
Zeitler, Seymour, S/Sgt.
Zerega, Joseph J., Lt.
Zielaskowski, Alfred M., T/Sgt.
Zimlich, Louis M., Capt.
Ziober, Aloysius A., S/Sgt.
Zonnis, Alberti, Lt.
Zumwalt, Mc Lyle, Capt.
Zumwalt, Philip A., S/Sgt.

DISTINGUISHED FLYING CROSS

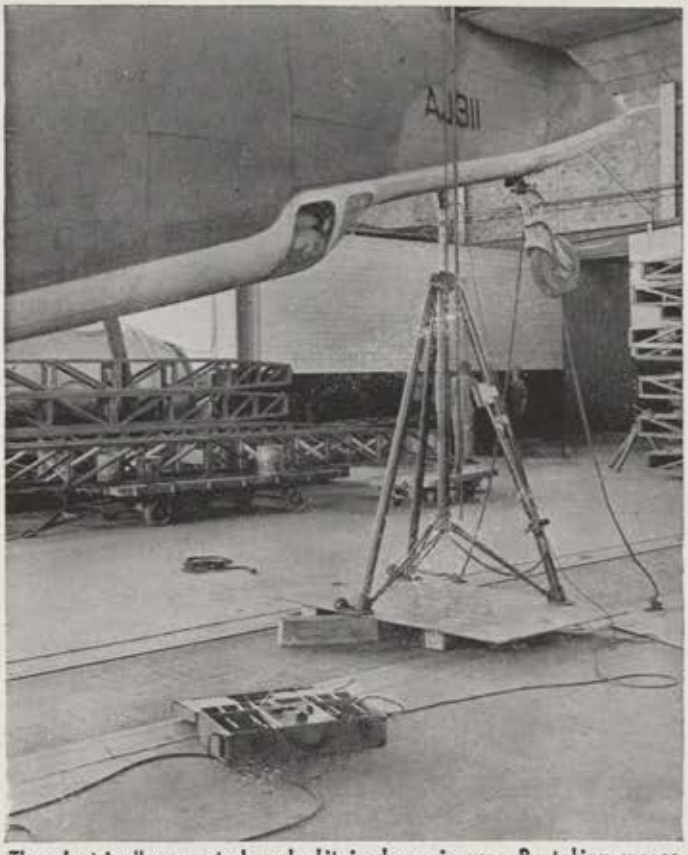
Boone, Carmon B., Capt.
Britt, Charles F., M/Sgt.
Brower, Fred I., T/Sgt.
Brown, Robert E., Capt.
Byrne, Joseph J., S/Sgt.
Caperton, John F., Jr., Lt.
Carlsen, Norman A., Cpl.
Carlton, Robert N., Lt. (& OLC)
Carter, Wallace A., M/Sgt.
Cipriani, Edward R., Sgt.
Clair, Delbert M., Cpl.
Clark, Donald P., T/Sgt.
Clarke, William D., Cpl.
Clendennen, Roger B., S/Sgt.
Cochran, Phillip G., Maj. (& 2 OLC)
Colburn, Frank M., Lt.
Compton, John T., Capt.
Consiglio, Frank J., S/Sgt.
Cook, Howard Gordon, Capt.
Cool, Kenneth A., Maj. (& OLC)
Couturier, Alfred J., T/Sgt.
Crabtree, Martin Purdue, Maj.
Craighead, Joseph L., T/Sgt.
Cravens, Samuel C., Lt.
Crissman, Howard C., S/Sgt.
Critchfield, Richard E., Lt.
Cronkhite, John L., Lt. (& OLC)
*Cullison, Richard M., S/Sgt.
Curtis, Earle W., Cpl.
Daniels, Edward L., Lt.
Danson, Warren R., Lt.
Davis, Nelson P., Lt.
Dean, Fred M., Lt. Col. (& OLC)
Debord, Robert M., Lt.
Deibler, Donald L., T/Sgt.
Dennis, Clifton E., S/Sgt.
Dickinson, Thomas K., Lt.
Dozier, Guy K., T/Sgt.
Drake, Cedric P., Lt.
Draper, Ray L., S/Sgt.
Duclos, Francis R., Sgt.
Dunn, Douglas Samuel, Lt.
Earls, Charles C., S/Sgt.
Eaton, Dudley Paul, Lt.
Eaton, Frederic C., Jr., Capt.
Edwards, James O., S/Sgt.
Eiland, John D., Jr., Capt.
Elliott, Robert W., Lt.
English, Robert W., Lt.
Erwin, William F., Lt.
Eubank, Robert H., Lt.
Fackler, Robert F., Lt.
Farley, George D., S/Sgt.
Faurot, Robert L., Lt.
Ferraguto, Leo H., Sgt. (& OLC)
Filley, Oliver D., Jr., Lt.
Finch, Stanley, S/Sgt.
Fisher, Albert S., T/Sgt.
Fletcher, Arthur A., Jr., Capt.
Forsyth, Robert J., Sgt.
Forte, Norman L., Jr., Sgt. (& OLC)
Francisco, Aby A., S/Sgt.
French, Harold A., Lt.
Frost, John, II
Fuhrmeister, Ralph S., Jr., Lt.
Geer, John H., Lt.
Gelatka, Charles T., Lt.
Getts, Charles H., S/Sgt.
Gilbert, James E., S/Sgt.
Gilbertson, John T., Lt.
Goebel, John A., Lt.
Golberg, Robert T., Lt.
Golecki, Leo E., S/Sgt.
Golotto, Frank, Sgt.
Gott, James E., Lt.
Gram, Phillip, Lt.
Gregg, Cecil E., Lt.
Gregory, Lewis H., Lt.
Groesbeck, Mac S., Sgt.
Habberstad, E. C., Capt.
Hale, Benjamin L., T/Sgt.
Hall, Alvin G., S/Sgt.
Hallstrom, Elmar H., Lt.
Hamilton, Linton D., Lt.
Hamilton, William, Sgt.
Hand, Clarence B., Lt.
Hannah, William W., Lt.
Harden, Dixie R., S/Sgt.
Harlow, Henry M., Capt.
Harriger, Robert L., Capt.
Harris, Francis H., Capt.
Harris, James Daniel, Sgt.
Hart, Edward M., S/Sgt.
Hartman, Elmer, Lt.
Harvey, Arthur J., Jr., T/Sgt.
Harvey, Harlock W., Jr., Lt.
Hawthorne, Henry J., Maj.
Heising, Richard J., S/Sgt.
Helton, Elbert, Maj.
Henderson, James M., Sgt.
Hernlund, Richard T., Lt.
Hetrick, Delbert R., Lt.
Hickey, Charles H., Lt.
Hillmann, David A., Lt.
Hobday, Albert J., Lt.
Hochman, Herman J., S/Sgt.
Hoelle, William J., Capt. (& OLC)
Holcomb, James H., Sgt.
Holcomb, Ray D., Sgt.
Holley, James B., Col.
Hopkins, Albert M., T/Sgt.
House, Kenneth L., Sgt.
Howe, Eugene L., T/Sgt.
Hubbard, Mark E., Maj.
Humiston, Leonard S., Lt.
Ilfrey, Jack M., Lt. (& 4 OLC)
Izzo, Alphonse, Sgt.
Jackson, Glenn Luther, Lt.
*Jacobs, Clifford T., S/Sgt.
Jacobson, Robert T., Lt.
Janette, Raymond M., S/Sgt.
Jeffers, Kenneth A., T/Sgt.
Jenkins, Richard H., Jr., Lt.
Jent, William T., S/Sgt.
Johnson, Clarence T., Jr., Lt.
Jones, Robert T., Lt.
Jones, Stanley V. N., Lt.
Jordan, Rufus E., Lt.
Jose, Elmer H., Lt.
Joyce, Thomas B., Lt. (& OLC)
Judkins, Francois J., Lt.
Kaiser, James M., Lt.
Kaminska, John E., S/Sgt.
Keeper, William E., Lt. ☆

TECHNIQUE

A Review of Technical Developments in the Army Air Forces

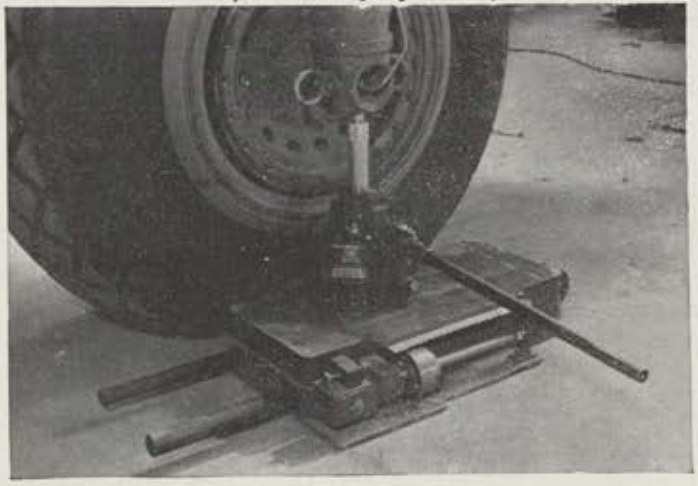


In the foreground is the scale unit with screw-type counterpoise on a weight-beam, which enables registering of weight up to 60,000 pounds. Beam is used primarily on dual-wheel landing gear (B-29 and C-54, for example) where space limitation does not permit jacking directly.



The electrically-operated scale kit is shown in use. By taking successive readings from each of three strain-gauge units, it is possible for modification mechanics to determine the total weight of the aircraft.

An axle jack supports the landing gear of a plane on this beam and lever scale which is capable of weighing loads up to 30,000 pounds.



THE PROBLEM OF

Weights and Balance

IN AAF PLANES

COMMERCIAL airlines in 1938 prescribed strict procedures on the proper load distribution of cargo and passengers when they discovered that some accidents were attributable to overloaded and unbalanced airplanes.

The Army Air Forces faced a similar problem early in 1942 when it began to modify its warplanes for addition of turrets, guns, auxiliary fuel tanks, emergency and other types of equipment. These modifications increased the weight of some aircraft by several thousand pounds, thereby limiting their original performance characteristics and making it necessary to revise the scale of weights and balance. Therefore, to know the exact range of a plane, its altitude and maneuverability limitations, it became evident that weight and balance data would have to be recomputed with the addition or elimination of every piece of equipment on an airplane.

When modifications are not made according to prescribed weight and balance standards, planes tend to develop nose or tail heaviness, to fly hard, get touchy on the controls and occasionally crash on take-off. Constantly changing operational conditions, together with new combinations of cargo, bombs, fuel, crew and armament, made it necessary to have new precision methods of determining weight and balance. These were soon forthcoming and standardized by the AAF.

A Handbook of Weight and Balance Data, containing information on the basic weight of the aircraft with all of its equipment and details on its center of gravity limits, is filled out by the manufacturer and accompanies each plane as it is flown away for service. Modification centers record any weight or balance changes in this book and crew chiefs who ultimately are assigned to the plane carry the responsibility for maintaining accurate records of all weight changes made in the airplane during its service life.

A load adjustor slide rule for checking proper distribution of additional loads or for compensating for removal of equipment is included in all planes capable of carrying extra weight. To simplify further the task of keeping aircraft properly balanced and loaded, new lightweight scales have been developed for domestic and overseas airbases by weight and equipment engineers of the Materiel Command and of industry. When properly used, these scales, supplemented by the

handbook and load adjuster, will eliminate guesswork and will preserve the safety margin built into AAF planes.

Most practical for use at overseas airdromes is the portable, seventy-pound, electrically-operated scale kit which records weight from resistance-type strain gauges, and the heavier beam and lever scale capable of recording plane weights greater than that of the B-29.

The electrical scale unit is equipped with small cylindrically shaped capsules, which are connected to a recording indicator (potentiometer), and variations in resistance resulting from the weight of the airplane are registered in pounds. By turning a selector switch on the potentiometer, readings can be taken from the three weighing positions—main landing gear and nose wheel or tail wheel. The capsules are made for mounting on ordinary aircraft or axle jacks, thus eliminating the need for additional equipment.

The beam and lever scale system contains three scales weighing 192 pounds each, and three beams designed for dual-wheel aircraft, weighing 147 pounds each. One scale has a weighing capacity of 30,000 pounds and, when used with the beam and an extra axle jack, can weigh loads up to 60,000 pounds. In combination with scale units on the other two landing gear positions, the three scales can weigh planes heavier than 100,000 pounds.

These new scales will relieve crewmen of many of the complexities involved in weighing an airplane properly while providing them with an accurate scale system that can be used readily at any airbase. These scales have been standardized and are being made available through the Air Service Command (Unit MQ4B, Patterson Field, Ohio).

Although procedure of weighing an airplane is simple, there are many precautions to be taken to insure the accuracy of results. Fuel and oil tanks should be drained; reservoir tanks for hydraulic and coolant fluids should be filled to capacity. The plane should be cleaned of dirt, oil and grease splotches, which often accumulate to an important weight component. Equipment that is not a permanent part of the plane—bombs, ammunition, crew members and the like—should be removed.

When the plane is mounted on the scales, particular care must be taken to avoid a sudden jolt that might disturb their calibration. Brakes should be released, since brake pressure can cause a false reading by thrusting the scale platform to one side. When jacks are used, each must be centered on the scale, as nearly as the jack point location will permit, with the jack head directly under the jack points of the plane's undercarriage.

So important has aircraft weight become during recent years that, in addition to AAF Reg. 55-3 prescribing weight procedures and responsibility (. . . No pilot will knowingly accept and operate any aircraft without satisfactory evidence of correct gross weight and balance. This is a matter of safety of personnel and equipment and will be strictly enforced.), the operations officer now is held responsible at briefings for "checking of aircraft for total gross weight, including details of loading as affecting CG (center of gravity) in special cases." (AAF Reg. 55-18).—Lieut. F. T. Carroll, Jr., Weight Branch, Engineering Division, Materiel Command.

Steam Table from Enemy Scrap

An overseas service squadron in the Mediterranean theatre recently added a touch of elegance to the field mess equipment in the form of a steam serving table made of German and Italian material collected in the area.

Front view of field steam table.

Burners from regulation range are used.

The idea for this table was developed by Maj. G. J. Albrecht after several months' experience in the field with meals served under adverse weather conditions. Results were usually less than admirable without the use of some heating arrangement since the food would become cold and less appetizing after half the men had been served. With the major's arrangement, food pans rest in water on the steam table and the water is heated by the burner from a regulation kitchen field range. In this manner the table precludes the necessity for re-heating meals for those unable to attend mess at scheduled hours.

Because of frequent moves in the theatre, compactness of all equipment is essential. The table, in two sections, can be completely disassembled in short time and requires little space for shipment. A limited number of blue prints for the steam table are available and will be sent upon request, according to Maj. C. J. Albrecht, First Service Squadron, APO 650, care of Postmaster, New York City.—First Service Squadron, overseas.

Flying Hood Modification

The two-color substitute instrument-flying hood has been modified at Columbus (Miss.) Army Air Field to inclose only the student since it is considered undesirable that the instructor should sit through successive lessons under the green transparent canopy.

A student pilot learning to fly by instrument wears red goggles which permit him to see the instrument board but, because red and green are complementary colors and combine to form black, the goggles prevent his seeing through the blue-green hood that covers the cockpit during this phase of training.

The comparatively short time that the student flies under the hood is without harmful effect and, while it cannot be said to inflict lasting harm on the instructor, successive missions month after month can make him intensely weary of staring through green.

A CAAF instructor, Lieut. Keith E. Patterson, put to Lieut. A. Stevenson, Jr., director of instrument flying, the proposal that since the hood was for the student's benefit alone, it should inclose only the student. The two conferred with Lieut. Webster N. Lyche, a squadron engineer, who produced the desired hood.—Public Relations Office, CAAF, Columbus, Miss.

Safety Platform

Nobody falls and breaks an arm, leg or back while at work on B-17 wing or tail surfaces at this 8th Army Air Forces Bomber Command base in England. A steel safety platform, made from scrap pipe and angle iron, is quickly mounted on

the boom of a wrecker when de-icer boots need pulling, when flak holes require patching or when a paint job is needed. It provides a steady platform with safety rails which can be raised to any height on the high tail of the Fortress—8th Air Force Bomber Station, England.

Buffalo Horns for Cannon Plugs

The place of the water buffalo in combat aviation has now been clearly defined by a lathe-minded sergeant of an AAF service squadron in India.

Tech. Sgt. O. P. Smith stood in the doorway of his machine shop one day and wondered where he could get a cannon plug for a B-24 which had just come in from one of the bombardment squadrons. Smith thought he could make a plug, but he could find no suitable material. While he was tossing this worry back and forth in his mind he watched a cart move slowly down the road, pulled by a pair of large water buffaloes.

Out of this set of suggestions and inspirations, Smith got the idea that a buffalo horn might make a cannon plug, if removed from the buffalo, of course, and tooled considerably. Smith obtained a horn from a local fruit vendor (this connection isn't made clear in our report from India) and set about checking it for insulation and resistance to heat. It stood up well under these tests and Smith got down to serious manufacture. When it was completed, he installed it in the Liberator and the bomber flew back to battle. Seven months later, the gadget was still giving excellent service. At this time, according to Smith, there are an undisclosed number of aircraft in the CBI using cannon plugs made of buffalo horns.

Horns of the Indian water buffalo took on new meaning for Sergeant Smith when he was faced with the problem of replacing a cannon plug.

From the pattern supplied by a broken bakelite cannon plug (upper left) the sergeant made the substitute (below). He is shown testing the buffalo horn with a blow torch to determine the heat resistance.

Swing Test for Air Sickness

A version of an ordinary playground swing is used at the School of Aviation Medicine, Randolph Field, Texas, to test the susceptibility of flying cadets to air sickness. Here A/C S. S. Oya of Los Vegas, Calif., takes a ride with the assistance of Pvt. S. Y. Uldoft of Brooklyn, N. Y. A headset and thermocouple measures the skin temperature and reactions during the forward and backward motion of the swing. The scale on the supporting beam measures the arc of the ride. ☆

PICTURE CREDITS

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Illustrated by Jim Rawls

SURVIVAL BY THE BOOK?

(PREPARED BY THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER)

Don't let your reading interfere with your being sociable with the natives; besides, the book *could* be wrong.

HUNDREDS of AAF airmen who have been forced to bail out over strange, wild territory owe their lives to what-to-do manuals which pointed out what to eat, how to keep warm, how to determine direction and scores of other vital facts useful in such emergencies. The mere possession of a manual in a survival kit has proved a source of confidence as well as a material asset in time of need.

Many stories of bail-outs, walk-outs, force-downs and long waits have made the AAF survival-wise. We hear of errors some men have made and we are sure *we* wouldn't make them. We know better than to rub frostbite with snow; we have learned that the traditional bottled snakebite remedy is the worst thing for a venomous bite. We have read survival stories critically and checked our knowledge against the actual experience of the officer who took his atabrine and purified his drinking water faithfully as he read selections from his manual to some bewildered natives while they paddled him to the nearest base. This officer who did things by the book, we learn, lived.

Survival books are fine things and for the most part the information in them is solid, worth staking your life on. However, many of these publications were prepared in haste to meet a desperate need and, inevitably, certain inaccuracies crept in. Clearing up these details for the record is in order at this time.

There is widespread belief, for example, that the problem of thirst on a life raft is solved: one squeezes a fish and water comes out. Or, opening a guidebook to the pictures of tropical plants, we peer through the jungle for mangoes and papayas and breadfruit. Or we look for monkeys to see what they are eating, and follow suit for safety.

Few of the available guidebooks give sufficient importance to the role of native assistance in the survival drama. True, there is usually a statement that most natives are friendly but should be approached with respect, anyway. In the light of a mounting number of walk-out experiences, it becomes increasingly clear that the first priority of survival, at least in the tropics, should be the seeking out of natives rather than the identifying of numerous varieties of local animals and plants (mostly cultivated, anyway), or the constructing of shelters.

ONE popular magazine article gave wide currency to the opinion that water can be squeezed from fish.

"If you get a good catch, you can squeeze out the juice from the flesh of extra fish, and drink it," a pamphlet said.

"Fish can supply both food and drink. Fish juice has been tested and found safe for drinking; it tastes much like the juice of oysters or clams. Eat until your hunger is satisfied and if there is an excess of fish the remainder can be cut in clean pieces and squeezed in a twisted cloth to force out the juice to quench your thirst," another advised.

The fact is that much greater pressure is required to squeeze liquid out of fish

than a castaway on a life raft can bring to bear. And then, the product is not worth the effort. As a report of the Committee on Medical Research of the Office of Scientific Research and Development points out, prolonged mechanical squeezing of seventeen pounds of fish *per man per day* would be necessary to provide about a pint of fluid. When water is short, dry any fish you might catch with your kit, and wait for rain. If you're thirsty, you probably won't feel like eating fish, anyway. Besides failing as a source of water, fish is primarily a protein food. Therefore, it requires the use of large amounts of water for elimination of wastes in urine. Fish as food is "contra-indicated," as the medicos say, unless you have at least a quart of water a day to go with it.

The same with birds. Sea birds are usually rather stringy, with little fat. So if a bird happens to light on your raft, as he is likely to do because he is more hungry than you are, don't accept him as a little prayer-answering visitor from God. That is, unless you have plenty of water, or it looks like rain. Obviously, the preservation of water is the biggest raft problem.

To avoid sweating by rigging a shade or keeping the body clothed is one way of prolonging life. There is another which makes sense, but may be dangerous. "Immersion in the sea helps, since some water is absorbed through the skin," one volume states. Other handbooks omit the erroneous statement that the skin can absorb water but repeat the advice to dunk the body to save water. Such advice disregards the likelihood that after a few days of exposure on short rations, the body may be so weakened that getting back on the raft after dunking may be impossible. Furthermore, immersion will wet the feet and slop up the bottom of

the raft. The same purpose—keeping the body cool by wetting—can be accomplished by taking off the clothing, dipping it in the ocean, wringing it out, then putting it on. Clothing should be completely dry by nightfall to avoid chill.

WATER is the main problem in the desert as well as on the ocean. Salt in relation to health and thirst must be considered in both places. Recent experimentation has indicated that some salt is necessary to preserve health even with limited water available. Thus, mixing sea water with fresh water, about one part salt to six fresh, is permissible, but the 1-3 ratio permitted by one authority is too high. Also, it is incorrect that salt tablets will "enable you to get along on less water" in addition to their actual use in helping combat fatigue and heat-stroke.

The problem of food rations is tied up with water supply. One volume lists "dried meats, fruit or Army Ration" as a desert need; another states, "As much as possible use foods that require less water to wash them down—such as packaged meats—avoid thirst producers like crackers and mealy foods." Both passages ignore the same physiological fact that pricked the fish-bubble: protein foods use up water. Crackers and mealy foods cannot be swallowed when the throat is dry, but when a little water is available they are preferable to meat. Dried fruit, which stimulates salivation, is a good ration. There has been experimentation with candy products like butter scotch or Charms as ocean and desert emergency food. These are the best. When assimilated they decompose into water, rather than withdraw it from the tissues, and still supply energy.

Most survival booklets recognize that the food problem, apart from its relations to water, is twofold: finding it and recognizing poisonous foods. Bearing in mind that the best way to find food is to find a local inhabitant first, we must still face the possibility of a bail-out in deep jungle or solitary northern waste.

In jungle, the common advice is: eat anything you see a monkey eat. Yet, monkeys eat strychnose fruit, but spit out the deadly poisonous seed, and they can swallow other fruits that would pucker a man's throat badly. Another caution is to beware of plants with a milky sap. This is good advice, but several edible tropical fruit plants *have* a milky sap.

A more inclusive formula would run like this: Eat nothing which has a bitter, soapy or burning taste. Some foods burn the mouth when raw but are safe after cooking. Most pulpy or juicy fruits are safe if they taste all right; but spit out the seeds. The larger fruits are more likely to be safe than the small ones. Nuts, dry seeds and roots are dangerous unless you know them. If a fruit is bitter, and from a plant with milky sap, steer clear. All grasses and bamboos, identifiable by the hollow jointed stem, are safe. Beware of wild tomatoes, parsnips, cucumbers, melons, onions and beans, but wild *fruits* (as the term is commonly used), resembling cultivated fruits like strawberries and raspberries, are likely to be safe. A single rule is this: if the food looks edible, try a spoonful; save a sample for identification; if it does not make you sick or have a purging effect in eight hours, eat more.

It is well to be prepared in an emergency to discard many civilized prejudices, such as those against eating grubs and beetles, and raw meat. But remember that non-poisonous varieties of salt-water seafood are just about the only kind of flesh that can be eaten raw with no danger. Almost any other kind of fish and some other animals are likely to carry

some kind of parasite that might take up lodging in your body. Eat it raw, if you have to, but cook it, if possible.

Cooking requires fire. A match is still the best all-around fire maker. These are two obvious statements, but they must be stressed. Proper preparation before a mission will insure that plenty of matches are on hand in a waterproof container. There is a danger that descriptions of primitive fire-making methods, based on friction, will lull us into being careless about wasting matches. It is possible to make fire by the fire-plow or fire-bow method, but only after much practice and perseverance. And one is not likely in an emergency to have time to experiment with wet wood and tinder. One booklet optimistically labels as "a simple fire-maker" what is probably the most difficult of friction methods: the twirling of a hardwood twig between the palms until it ignites tinder around the point.

A number of possibly misleading statements concern animal foods. We read repeatedly of the dangers of eating polar bear's liver and rabbit meat in the north, but analysis shows the problems to be trivial. Rarely does a man see a polar bear in his native habitat. As for the odds against killing one and getting the carcass ashore where the liver can be cut out, well . . . And it is true that a steady diet of northern rabbit, with nothing else to live on, will cause a metabolic upset because of the absence of fat on the lean flesh. But the chances of a castaway airman having to subsist on a pure diet of rabbit meat, or even his chances of finding enough rabbits to be able to start suffering from protein over-abundance (so-called "rabbit poisoning")—again, well . . . The statement that "a straight rabbit diet will lay you low in a week" presents a distorted picture of the problem.

Another arctic fallacy is found in this published statement: "Deep breathing can cause frosting of the lungs, and this will lay you up for several days." No case of actual lung-frosting has ever been reported by northern physicians. Deep breathing of cold air may cause pain in the upper respiratory passages, which has given rise to the "lung-frosting" assertion.

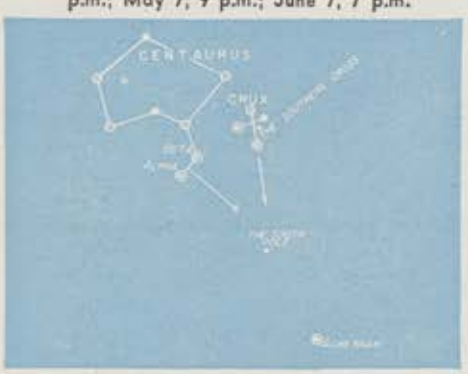
An important phase of the survival problem is determining direction. Under certain conditions a watch can be used as an emergency direction finder, as described in one publication. But in tropical latitudes the system is quite undependable, because of the altitude of the sun.

The Big Dipper is a dependable indicator of true north, when the sky is reasonably clear. But its value decreases in just those regions where accuracy is most important—the far north and the tropics. Since the altitude of the North Star changes with the latitude in which the observer finds himself, the star will be too high, practically overhead, in high arctic latitudes and, in the northern hemisphere tropics, so low as to be obscured frequently. However, if the pointer stars of the Dipper are visible, the approximate position of the North Star can be judged at about five times the distance between the pointers, even if it is below the horizon, or obscured. The Dipper is useless in the southern hemisphere.

The use of the Southern Cross as a guide in the southern hemisphere is neglected in most of the survival books. By projecting the long axis of the Cross to a point where it intersects a line bisecting the line between Alpha and Beta of Centaurus, one can approximate due South. Find a good star chart and check these points.

But the sum total of advice on direction-finding is that nothing takes the place of a compass. Keep it with you. Keep it dry. And trust it! ☆

Star chart of the southern sky as seen from southern latitudes: April 7, 11 p.m.; May 7, 9 p.m.; June 7, 7 p.m.



A Report on Army Air Forces Training Devices

Cardboard Cockpit Trainers

Ingenious, inexpensive devices known as Cardboard Cockpit Trainers (not to be confused with Cockpit Mockups) will soon be available throughout the AAF to aid new pilots in cockpit familiarization and cockpit procedure before the opportunity to spend the necessary hours in the actual cockpits is provided.

Combat planes are rushed to theatres of operations and only a minimum number are permitted to remain in the States for training purposes. The Cardboard Cockpit Trainer is designed to fill the need resulting from this drain on combat type aircraft available for training.

At present there are under development Cardboard Cockpit Trainers for the B-17, P-38, P-39, P-40-F, P-47, P-51, P-70, A-20, B-24, B-25, B-26, B-29, C-46, C-47, C-49, C-53, C-54, C-60, C-87 and others.

WHERE TO GO

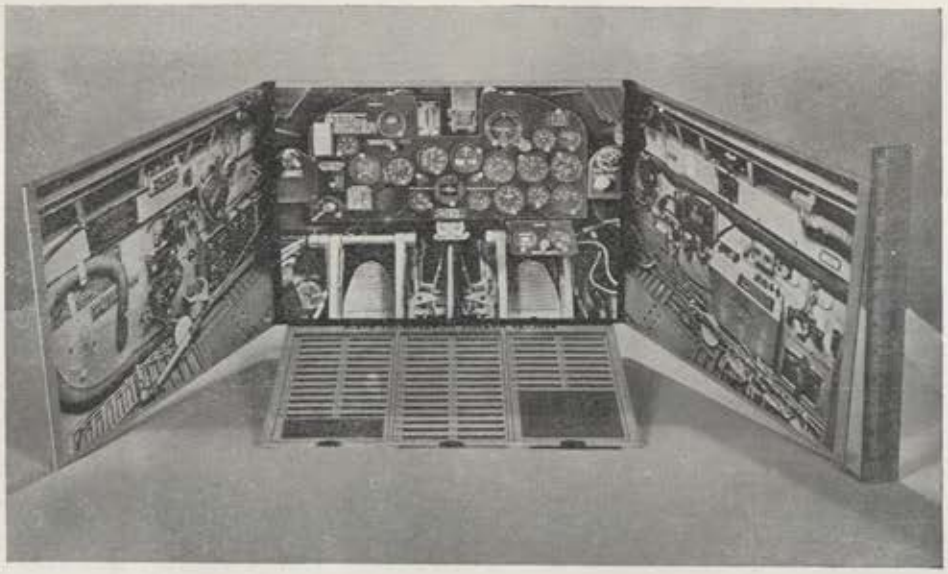
Information on the availability of training films and film strips, aircraft recognition materials, training devices and training publications may be obtained from the Chief, Training Aids Division, Army Air Forces, 1 Park Avenue, New York 16, N. Y., upon request through channels. AAF Regulation No. 50-19 explains fully the functions of the Training Aids Division.

In his study of cockpit procedure the trainee is taken through every step he would experience from the moment he climbed into the actual cockpit, including before starting, starting, warm-up, magneto-check, take-off, climbing, before landing and stopping.

On the average these trainers are about 15 by 20 inches when folded. Opened and set up for use, they are in the position shown in the accompanying photograph. Trainers for heavier aircraft have an extra top and front panel in order to accommodate the added instruments. Each item in the cockpit photographs is designated by a numbered arrow. A panel or "apron," provided with slots and sliding cards, comes forward from the middle section and lies flat on the desk or table. Each of the cockpit photograph numbers is identified on this panel. Identification may be blanked out by sliding the cards back, thus helping the trainee to commit the instruments to memory. When in doubt he can slide the cards forward to reveal the identification and check his progress.

The Cardboard Cockpit Trainer was not designed to replace blindfold tests or actual cockpit time but to assist the new pilot in familiarizing him with his new "office." "Desk" pilots who are unable to fly regularly, may use the device as a refresher.

Below: P-47 cardboard cockpit trainer.



New Recognition Manual

A new 46-page illustrated manual, "Instructor's Guide for Recognition Training in the Army Air Forces," is available to instructors teaching recognition in the AAF. This manual, the approved official guide for recognition training in the AAF, outlines methods and techniques which have proven of great value in teaching recognition.

Fighter Control Training

Detailed information is now available on a synthetic training system for the operation or training of a fighter control squadron. Necessary equipment for the program consists of one SCR 572 (mobile operations room) and two C-3 link trainers.

Armored Vehicle Recognition

Distribution of Field Manual 30-40, "Recognition Pictorial Manual on Armored Vehicles," has been made in bulk to headquarters of Commands and Air Forces for redistribution to component units. Requests for additional quantities should be sent through channels to AFTAD in the same manner as for any Field Manual.

Send Devices URs to AFTAD

It is recommended that a copy of each "Unsatisfactory Report" (AAF Reg. 15-54) on *training devices* be forwarded to AFTAD. This Division is interested in knowing how the devices stand up under everyday usage. These reports not only will help AFTAD in the development of new devices, but may also result in assistance from AFTAD in correcting the unsatisfactory condition.

Training Aids for Convalescents

Recognition gadgets, film strips, booklets, posters and training devices by the hundreds have been furnished the AAF Convalescent Training Program by the Training Aids Division.

The recognition section has supplied memo-Morse symbol cards, cardboard models of aircraft, tank and ship models, recognition posters, WEFT recognition books, aircraft silhouette playing cards and sema-form drill charts.

From the devices section have come such devices as automatic film raters, visual quizzers, panoramic gunnery trainers, Sawyers viewmasters, 3-A-2 flexible trainers, turret gunnery trainers, range estimation and recognition trainers, mirrorphones and tactical boards.

The film section has furnished various types of training, orientation and morale films.

The illustration section recently designed a booklet which was issued by The Air Surgeon, entitled "You Are Convalescing in the Army Air Forces Hospital." A copy of this booklet is being given to each patient at the time he begins his Convalescent Training Program.

The graphics section has initiated a project for bi-weekly posters on the theme of "Join a Class." Graphics also will furnish cardboard cockpit trainers of twenty different aircraft for use throughout AAF Hospitals.

The publication section has furnished material on a wide variety of subjects, including booklets on "Defense against Air Chemical Attack," "Airway Flying" and "How to Use Film Strips." Other publications cover gunnery, intelligence, map reading, navigation, recognition, weather and the like.

More Arms Posters

Air Poster Series have been initiated on the 20 mm gun, 37 mm gun, "Bombs and Fuzes" and "Pyrotechnics." These are instructional charts employing the same technique as that used in the training charts for the .30 caliber M-1 rifle and the .50 caliber Browning machine gun.

* * * *

A consolidated bibliography of publications used by the Army Air Forces schools has been assembled for use of those units dealing with electronics. ☆

'Arctic Living' Posters

A series of ten posters on how to live in arctic regions has been prepared by the Training Aids Division as a companion series to the posters illustrating care of equipment in cold weather areas, which were announced in the March issue of AIR FORCE.

Posters in the "Arctic Living" and equipment sets are the final results of more than 150 pencil sketches and 110 photographs made by AFTAD artists and a post photographer at the Cold Weather School, Buckley Field, Colo. Developed in collaboration with the Arctic, Desert and Tropic Information Center and the cold weather liaison officer of the Materiel Command at Wright Field, the posters offer sound advice on mistakes to avoid in the arctic in checking harmful effects on the extreme cold.

The posters are of standard 30-by-40 inch size and are assembled in the standard AFTAD binder.

'ONE OF MY BOYS'

(Continued from page 31)

three wing man almost literally to death.

Well, that was that! I headed for home, with him trailing a miserable couple of miles behind.

After we had landed, he met me with a very sad expression on his homely face and apologized all over the place. I hadn't said a word, but I floored him completely by writing out his pink slip right then and there in front of him.

After I had flown dual with him again he showed enough improvement for more solo. We had gotten up to about 8,000 feet when he began holding position pretty well. I got him into an unauthorized echelon and we did some pretty unauthorized rat-racing during which I pulled just about everything possible in a BT-13. Believe it or not, the kid followed me in trail and stayed right with me throughout the works.

Due to the section being SNAFUed from time to time, he was just about last to take his forty-hour check, and he developed the worst case of "checkitis" I had ever seen. I managed to calm him down a little with a lot of malarky about how, after all, it was just another dual ride, but he didn't seem to be too much at ease and I began to worry about him a little. However, when I saw his grin as he checked back in with the dispatcher I knew that was one less obstacle for him to get over.

He began to feel pretty "hot" the next day—and he had his first accident. I think he had been trying to show some just-soloing lower classman how good he was because he had begun rolling too fast and it was the same old story. Too fast, too much brakes too quickly applied, and up she had gone on her nose. He really caught hell about that but he learned his lesson and I think it cured him forever of thinking he was a hot pilot.

Just before his class left for Advanced, he came up to me and stuck out his hand and said, "Thanks for everything." I always feel kind of funny about sending kids on to Advanced, always wonder if I've honestly given them everything they should have. So I stood there, feeling like a father whose son was going out into the world, and tried to give him some last-minute advice. Then he went out and got his stuff, and the last I saw of him he was getting into the truck to leave.

So now he's a hero. Silver Star, DFC and the Purple Heart. Just "one of my boys," the skinny kid at whom I had yelled "more right rudder, goddamit!" until I'd been blue in the face. The same kid I had wondered about for his physical, the one who almost sweated blood on his first solo. There he is, first pilot in a Liberator, and here I am, still a back seat driver in a "Vibrator." Wonder if he remembered to use small pressures on the controls when he was on his way back from Ploesti in zero-zero weather? I wonder if he is still using ailerons excessively in those 1,000 plane formations? I think not. And I wonder if that 5,000 word essay on "Why I Should Look Around" paid off when the FWs and MEs came after him?

Well, go to it, boy. You're my only chance to take a crack at the damned Hun, so give 'em a couple of blockbusters for me. Hope you'll never let yourself get too cocky; things have a habit of happening to the guy who thinks he's too good. Remember the check list always: you never know a ship well enough to forget that. Remember the simple fundamentals you learned in school; the tougher things will come easier if you do. Remember we instructors over here speak of you over there as "one of my boys"; remember, I'm damned proud you are. ☆

MISTAKES IN 'ON THE LINE' PICTURE ON PAGE 43

1. Four men and one hoist is "no soap" for installing a 1,500-pound wing. Proper procedure requires six men to achieve proper balance: one on each side of the inboard end to watch wing attaching bolts and proper alignment of lines and aileron torque tube; two at wing tip; one at aileron, and another to operate hoist control.

2. The horse near the wing tip is too close inboard and wing weight is not supported by ribs. A damaged wing with mashed skin and stringers will result, hampering aerodynamic cleanliness. See TO 01-1-40, reviewed in ON THE LINE in February.

3. Here's the trick question we hope you've doped out, men. It was stated beneath the picture that the landing gear is down, which is incorrect during wing installation. The wing will be thrown out of balance by the extended landing gear which is liable to hit the ground, causing severe strain on the landing gear structure. *Why is it down?*

(a) The explanation for this boner goes back to the wing repair shop, where somebody forgot to lock the landing gear.

(b) The mechs installing the wing neglected to check and make sure that the landing gear was locked prior to installation. PS: The fluid is leaking.

4. The sergeant struggling with the inboard end of the wing is steadying himself by placing his foot on a horse with wheels. It's surprising he didn't slip before the picture was snapped. Furthermore, he's in the middle; he'd be the ham in a hard sandwich if that wing suddenly swung over to the fuselage. Reference: Common sense.

5. There's not much hope of survival for that aileron tube which will be struck and damaged by the weight of the wing. If riggers don't know about the damaged tube in attempting to rig aileron, they will wonder why ailerons won't work. Repair of the tube will be time wasted, delaying completion of wing installation.

6. One of the cables from the hoist is frayed—a grave danger to the men working as well as to the wing itself. Figure 19, TO 01-65BC-2 illustrates the point.

7. For proper installation, the entire wing should be at right angle to the fuselage, not off balance as it is here. Again, TO 01-65BC-2 gives the explicit explanation.

Incidentally, nearly every post has a local regulation against wearing flying boots while working in a hangar.

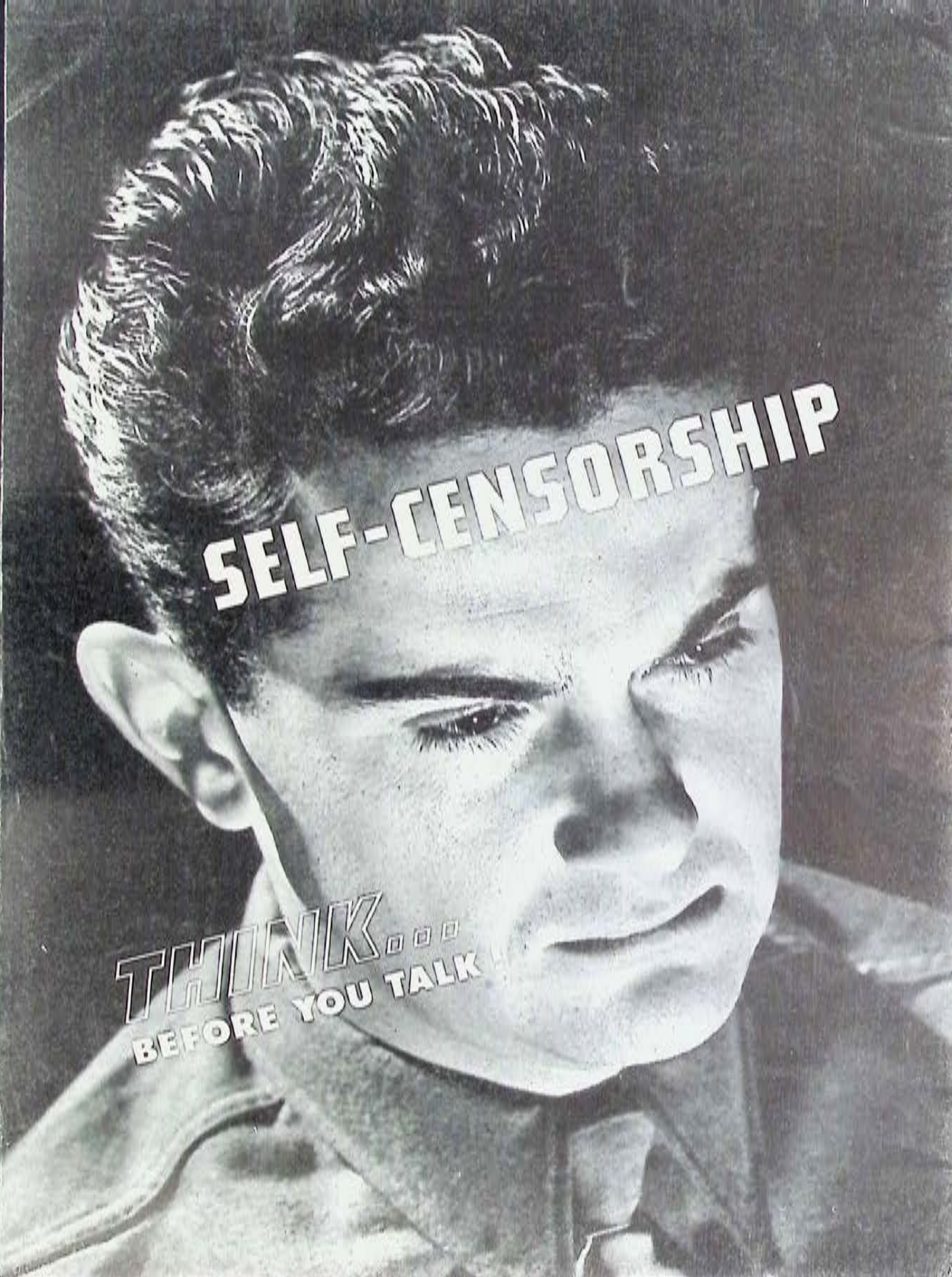
Answers to Quiz on Page 40

1. (d) Twin-engine bomber
2. (d) Takes pictures from low level
3. (b) Louisville, Ky.
4. Absolute altitude refers to the height of an aircraft in relation to the ground directly beneath it; absolute ceiling is the greatest height above sea level at which a given airplane can maintain horizontal flight under standard air conditions.
5. (b) P-38
6. (b) The bends
7. (b) Twin-engine fighter-bomber
8. (c) Thunderheads
9. (c) Purple
10. Supreme Headquarters of the Allied Expeditionary Forces.
11. (b) Lieut. Gen. George C. Kenney
12. (d) 2,100
13. (a) True
14. (b) False. AR 600-68, May, 1943, states, "The award will not be made to an enlisted man whose records during the required period of service disclose a conviction by any court martial, nor to one whose character or efficiency is rated below excellent."
15. (d) Off the coast of Holland
16. (b) False. An air mile is 6,080 feet; a land mile 5,280 feet
17. (c) $60
18. (b) False. The standard Lister bag has a capacity of 36 gallons.
19. (b) False
20. German FW-190

Printed in U. S. A.

BOMBING UP FOR BERLIN

Finned and fuzed, these bombs are ready to be flown and dropped over Germany, and it is the last time the armorer will have to handle them, he hopes. In all, according to an estimate of the 8th Air Force Service Command, a bomb has to be picked up and shoved around 32 times in its moving from the hold of a ship to the bomb bay of a B-17. The moves: four, from the hold to a dock cart; three, from the cart to a goods wagon; two, from goods wagon to a truck on an ammunition train at a depot railhead; three, from the truck to the ramps on the bomb dumps; three, from the bomb dump ramp to a QM truck which takes it to the station ground; seven, from QM truck to the top of the stacks at a revetment; ten, from the revetment to the shackles in the bomb bay. This does not include other work such as covering a filled goods wagon with tarps, removing the tarps, building and camouflaging ramps, or even the handling of fuzes and fins.


SELF-CENSORSHIP
THINK...
BEFORE YOU TALK