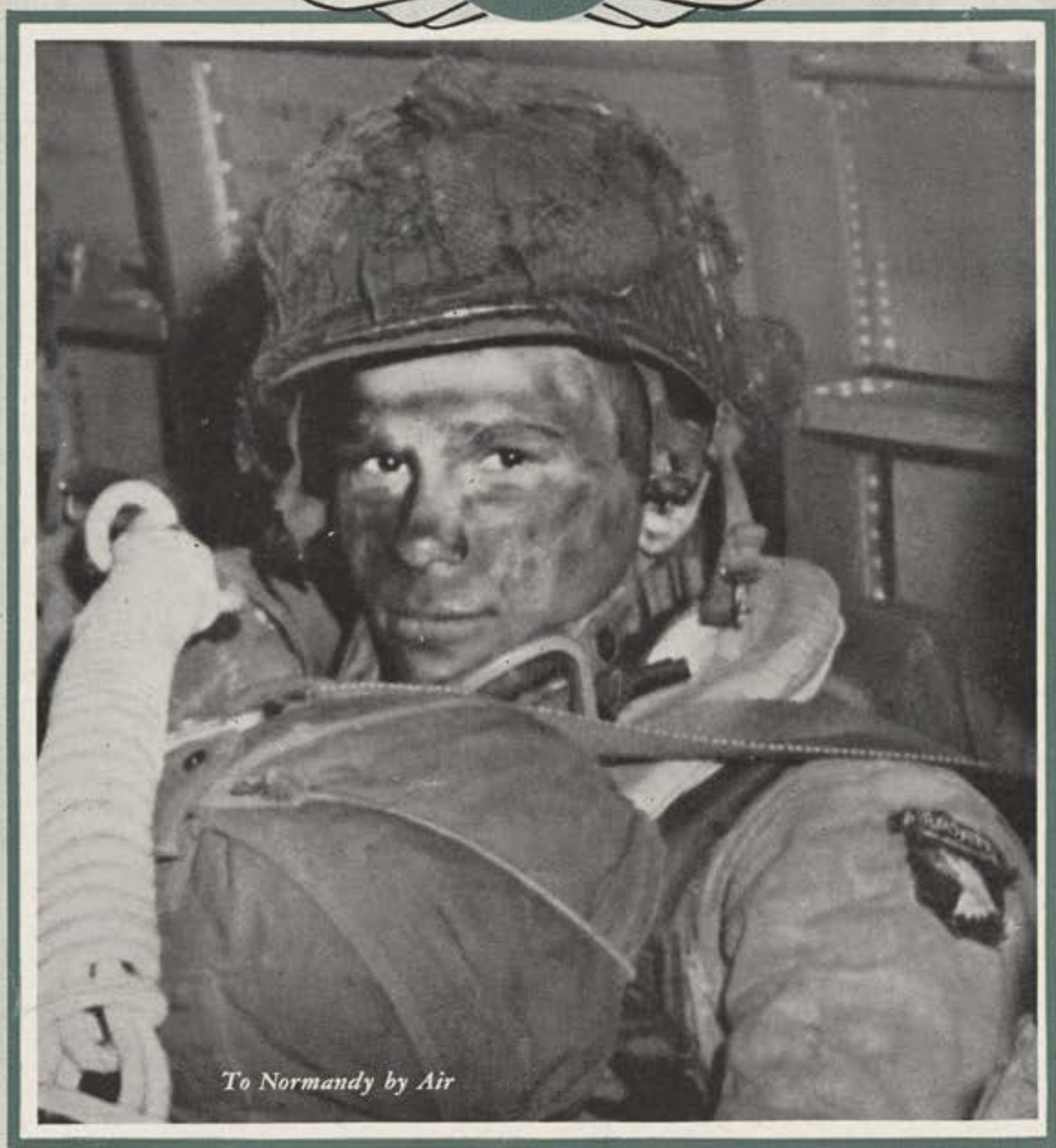


AIR FORCE

THE OFFICIAL SERVICE JOURNAL



OF THE U. S. ARMY AIR FORCES



To Normandy by Air

AUGUST 1944



This armada of 15th Air Force B-24s is blasting an oil refinery at Ploesti, long one of its vital targets. The attack, which occurred on May 31, left the cracking plant, storage tank area and oil pumping station in flames, and reduced the plant's oil production 90 percent. This attack was part of an offensive coordinated with the 8th Air Force and aimed at blasting Nazi oil plants throughout industrial Europe. For a report on this strategic offensive, read "After D-day" in this issue.

CROSS COUNTRY

SPEAKING as a magazine, we are more than a little interested in what you do with this copy of *AIR FORCE* after you have finished reading it. If you fail to pass it along, you may be preventing others from seeing a copy of this issue. The number of copies of your service journal distributed each month is great, but the AAF is a big outfit spread all over the globe. Our bulk distribution plan is dependent on your cooperation in sharing every copy with other readers.

☆

AAF Regulation 20-43 redesignates the Assistant Chief of Air Staff, Materiel, Maintenance and Distribution as Assistant Chief of Air Staff, Materiel and Services, with responsibility for "complete control and supervision over the activities assigned to the Director, AAF Materiel and Services." The latter organization, just created, combines the Air Service Command and the Materiel Command. Maj. Gen. O. P. Echols is the Assistant Chief of Air Staff, Materiel and Services. Lt. Gen. W. S. Knudsen is the Director, AAF Materiel and Services with Maj. Gen. Bennett E. Meyers as his deputy. Maj. Gen. D. H. Dunton is commanding general of the Air Service Command, Brig. Gen. K. B. Wolfe of the Materiel Command.

☆

To maintain proficiency among aerial gunners, the WD has announced that a limited number of AAF commissioned officers (within the continental limits of the USA) will attend the new course for flexible gunnery officers at the AAF Instructors School, Laredo, Tex. Graduates will be rated Aircraft Observer—Flexible Gunner and will be on flying status.

With need for such officers recognized, their work carries on from where basic gunnery school leaves off. In addition to continuing instruction in flexible gunnery and keeping gunners abreast of tactics, equipment and accessories in bomber aircraft, the combat gunnery officer acts in liaison, first, with the armament officer to assure proper maintenance of equipment; second, with the operations officer and other agencies to coordinate the planning of tactical operations.

The gunnery officer is a combination of efficiency expert and godfather to the aerial gunner. To understand the gunner's problems, he will serve as gunner on occasional missions. The TO of bombardment units has been changed to provide a flexible gunnery officer in place of the assistant operations officer-pilot. He will

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AIR FORCE

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

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August, 1944

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BLUE STARS

and

RED STARS



By Maj. Albert Lepawsky

Commandant, Eastern Command Headquarters, USSTAF

Major Lepawsky, author of the accompanying article, was one of the original thirteen officers sent to the USSR to set up the Eastern bases for the AAF shuttle bombing system. He was adjutant of the pioneer cadre and served as executive officer at a fighter base in the Soviet Union before becoming commandant of Eastern Command Headquarters. Formerly historian for USSTAF, ASC, he now, in addition to his other duties, is historian for the Soviet project.

As the formation of B-17s roared over an airdrome somewhere in the USSR, the leader broke away, circled and came in on the mile-long runway.

The other planes swung around to land and the bomber on the strip taxied behind a shepherding jeep to a dispersal point. There, Lieut. Gen. Ira C. Eaker, commanding general of the Mediterranean Allied Air Force, stepped from the Fortress and walked toward the control tower amid the cheers of men of two allies.

Taking off from Italy a few hours earlier, the B-17s had attacked the Nazi marshalling yards at Debrecen, Hungary. Now, far across the Continent, they were methodically descending, one by one, on a new base for AAF operations in the USSR.

It was an historic moment. It signified the completion of a triangular shuttle bombing system by the AAF, which now

was in a position to pound the enemy from three approaches. Waiting to greet General Eaker at the control tower that auspicious June 2—four days before the land invasion of Western Europe—was a group of Americans who had played leading roles in the creation of the Eastern bases, necessary for the England-Italy-Soviet Union triangular shuttle.

Lone civilian in the welcoming party was W. Averell Harriman, American ambassador to the USSR, who, at President Roosevelt's direction, had laid the economic and diplomatic foundations for the project through Lend-Lease and the Moscow and Teheran conferences.

Other greeters were Maj. Gen. John R. Deane, chief of the United States Military Mission in Moscow; Maj. Gen. Robert L. Walsh, chief of AAF operations in the USSR, and Brig. Gen. (then Col.) Alfred A. Kessler, Jr., commanding officer of the Eastern Command, USSTAF. These three were the ranking representatives of many

other AAF officers and enlisted men who had been stationed in the Soviet Union to set up the new bases.

In establishing the shuttle's eastern terminal, the AAF was faced with a prodigious task. Shuttle bombing is one of the latest stages of strategic development in the air war. It is a new twist to the already perfected AAF bombing technique of high-altitude precision attacks upon key targets by daylight.

The shuttle operation can gain its full effect only when base facilities at all ends of the shuttle are of the same standard. In order to maintain the relentless schedule demanded, planes must be sent into the air as promptly from one terminal as from another.

Furthermore, unless the facilities of the new bases are as adequate as those of the previously existing bases, the general average of performance will drop. We learned that from experience with our first shuttle—that between England and North Africa.

To establish new bases in a far corner of the globe and then immediately to give them parity with older bases in more accessible locations was no easy matter. True, the AAF had plenty of skilled personnel and superior equipment and supplies, and it knew the proper procedures and techniques to be utilized in blasting the enemy. Transplanting these elements to distant points was the big problem.

The project required vast shipments of equipment; a constant flow of personnel

Men of the AAF and their Soviet allies live and fight together as bases are established in the USSR for the triangular shuttle bombing of Nazi Europe.

and supplies; an elaborate system of communications connecting the Soviet base area, the United Kingdom, Italy and Moscow; a new type of coordinated field order; Soviet clearances and escort, and creation of a corridor for AAF planes through a front that had been so well sealed off to daylight operations from the West that even returning Red planes were in danger from their own defenses.

But despite its magnitude, the job was completed on schedule. Through its efficient shuttle system, the AAF tied together the Eastern, Western and Mediterranean fronts over the roof of Europe. It turned the handicap of distance into an advantage. For by enlarging its choice of targets and routes, the AAF forced the enemy to spread his defenses. The result would be more confusion for a Nazi air force already strained by its increasing commitments on new Allied fronts.

BUT neither AAF brains nor ingenuity could have achieved successful conclusion of the tremendous undertaking without the genuine cooperation of the Red Air Force. The job was done by a mixed team from top to bottom.

In previous experience in inter-Allied military operations, mixing of personnel of separate nations occurred only at headquarters, with very few exceptions. In the field, units up to the size of squadrons and battalions were usually kept intact.

In the Soviet-American project, however, personnel were deliberately mixed down to the smallest element. The objective was to merge the specialized skills of the AAF in strategic bombing with the Soviet manpower necessary to help maintain base services.

This circumstance arose partly from the infeasibility of setting up a complete all-AAF organization for the project, partly from the practical Soviet policy of restricting Allied operations on Soviet soil to what were absolutely necessary, and partly from an experimental point of view, for each air force wanted to feel the other out and discover how they could best work together.

They found they could work together perfectly. Everywhere that was in evidence. It resulted in the finest of feeling between the men of the two allies.

On a typical day, American and Soviet officers could be seen huddled over a diagram inside an American tent, designated by a neat sign in both languages as Soviet command headquarters. In an orchard on the edge of an airdrome, AAF and Red pilots compared notes on tactics, not so much in words as in the universal sign language of airmen. On the line, ten Soviet mechanics worked on a B-17 under the direction of an AAF crew chief.

Close by, a team—half Soviet, half American—was loading bombs. Two signalmen, climbing adjacent poles, wore fatigues so similar that the American could

be distinguished from the Red soldier only by the latter's flight cap with its small red star with hammer and sickle insignia. At headquarters mess, American and Soviet officers ate at the same tables. A Red officer helped himself to American canned milk while an American officer sipped his tea, spoon-in-cup, Soviet style.

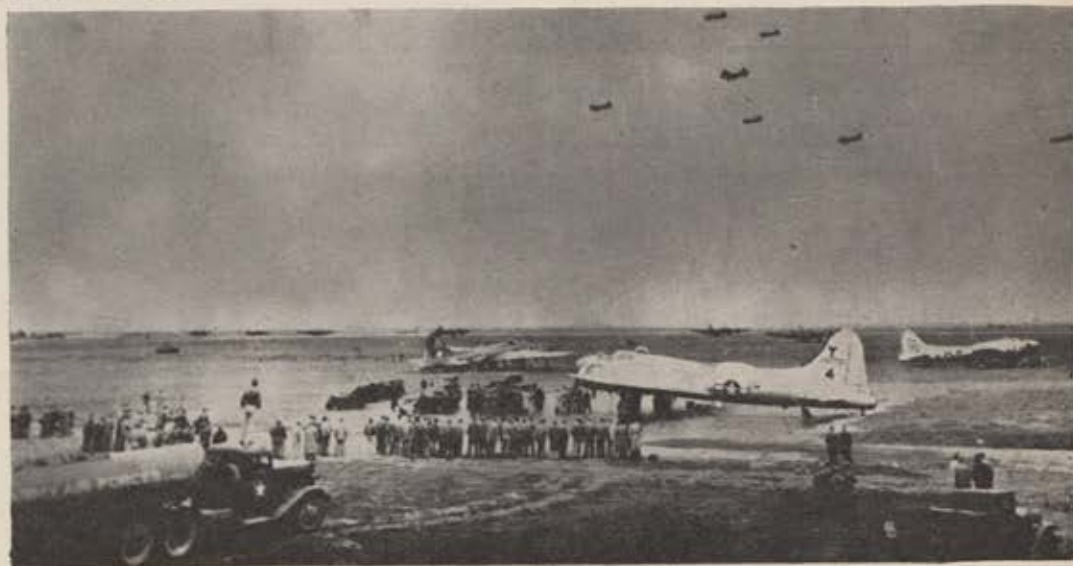
As an emergency supply convoy sped between two American bases, it could be seen that the drivers were Red soldiers and that the trucks were American—some Lend-Lease equipment bearing Soviet insignia, the others AAF equipment with American markings. From a jeep which darted along the column, an American officer shouted instructions in a lingo that was half Russian, half English. And the Red drivers yelled back the American expression: "OK."

soon found himself at 10,000 feet, flying with a formation of Soviet fighters in what probably was the first mixed tactical operation of this type.

We began also to realize better the need for recognizing our Allied planes. Not that our pilots had made the mistake of firing at friendly aircraft. But in their anxiety to avoid such an occurrence, they had missed several kills in combat.

As far as personnel was concerned generally, the Soviet forces not only furnished the greater part of the manpower but they organized a new type of technical, engineering and service battalion, necessary to supplement the special cadres of officers and non-commissioned specialists assigned to the project by the AAF.

Symbolic of the Reds' cooperation was their organization chart. To depict the



Completing the AAF's inaugural shuttle bombing mission from Italy to the USSR after attacking Nazi marshalling yards in Hungary, leading B-17s have landed while others peel-off to come in.

Even in the air, which is the most delicate testing area of a man's ability to work with his fellows, the experiment met with great success. In certain non-combat flights, Soviet airmen were assigned as opposite numbers to AAF crew members. The results were good despite a language problem and differences in flying habits.

Soviet pilots like to fly on the deck more often than Americans do. They also put their tails down a little sooner and a little longer and they mix their stunting with routine flying. We found, too, that the Red flyers prefer to use magnetic rather than true bearings, that they reverse our plus and minus signs to designate magnetic variations and that they interchange our terms for "heading" and "course."

The AAF's elaborate control tower procedures and ground-to-air communications had to be coordinated with the Soviet visual signal system. We learned to watch our flares more carefully. There was the amusing incident of one of our Mustang pilots on day alert taking off without carefully checking the flare color. He

mixed teams for the bases, they used a red star for Soviet Air Force personnel and a blue star for AAF personnel. The blue star was above the red one in all instances except one in which the two were on the same level. Even in that case, the arrow of command decision started at the American and extended to the Soviet star.

Formal command over Red soldiers was exercised only by their own officers, but as a matter of practice this did not prevent American commissioned and non-commissioned officers from giving directions. All their orders were cheerfully followed.

It would be unrealistic to assume that Soviet and American military organizations meshed without some need for adjustment in particular cases. With U. S. military authority completely in the hands of commanders on the spot, some concessions in our thinking had to be made to the Soviet system of providing checks at the top of the hierarchy through such organized military authorities as the Foreign Liaison Section of the Army or through the Border Guards.

Sometimes routine arrangements would meet a temporary impasse, but matters would be straightened out as soon as we saw each other's slant.

During the unloading of initial supplies at one of our stations, for instance, the Reds insisted upon moving the heavier and bulkier materiel first, leaving us the job of handling many classes of complicated aircraft parts and equipment at night. But after we explained that there were thousands of delicate parts that had to be unpacked and binned according to a definite system of classification for supply and maintenance purposes, they gave the unloading of this materiel priority.

After all, these lessons in American technology were what the Soviets wanted to learn. Our duty was merely to make the reason behind our procedures clear to them. Once they understood, they would go along with us.

The Reds' desire to carry out their assignments faithfully and diligently was demonstrated time and again. We saw Soviet officers, who had accompanied our supplies on the long trek from remote ports, spend hours tracing one box of equipment which was on their manifest but somehow had gone astray.

Another unforgettable scene was that of a Soviet sergeant crying like a baby because he had run over a stump and bent slightly the crankcase of the new American vehicle he had so carefully washed and serviced that morning.

Long hours meant nothing to the Reds when there was a job to be done. On one occasion, our chief engineer noticed that the same Soviet engineering crew was working a long shift every day on our installations. He suggested to the Red engineering chief that it might be better to adopt the American method of splitting the men into two crews and work one from 0400 to 1200 and the other from 1200 to 2000. The Soviet officer agreed it was a good idea. He divided the men into two crews but the next thing we knew he was working both of them from 0400 to 2000.

Regarding hours generally, however, we found the Soviets were modifying their program rather than requiring us to do in Rome as the Romans do. They even changed their mess schedule to conform with American custom. It soon was breakfast at 0700, dinner at 1200 and supper at 1800 rather than the Soviet habit of meals at 0900, 1400 and 2000.

We, too, learned to make concessions along these lines. At one of our stations, we substituted the Soviet custom of tea, bread and cakes at 2200 for the American habit of raiding the ice-box before bed-

time. And we became accustomed to being aroused from sleep anytime after midnight for either a routine or emergency conference with the Soviet officers, including the commander himself, Major General Perminov, who was decorated by the United States with the Legion of Merit medal for his energy and effort.

In their friendly desire to provide us with every facility, comfort and convenience, despite their own supply shortage, the Reds faced us with many problems. Not content to furnish us with well-sprung steel beds with straw ticks, they later insisted upon substituting soft cotton mattresses and adding fine pillows,

messhalls and living quarters came from forests miles distant, sometimes by primitive transportation. Delay in construction was caused also by the Soviets' insistence upon their fanciest workmanship.

Before we could set up our own feeding arrangements, our enlisted men and officers were royally fed by the Reds. Nothing but the best was the order and some of the fine foods had to be shipped from vast distances.

We finally persuaded them to substitute long tables for private foursomes and large boarding-house style dishes and some elements of the cafeteria plan for their many courses and their small dishes



S/Sgt. R. E. Robinson of Huntington, W. Va., examines Soviet Army woman lieutenant's shoulder stars at a base in the USSR. Above her pocket she wears AAF insignia given her by American GI.



First AAF shuttle plane to land in the USSR was this P-38, piloted by Col. P. T. Cullen on a photo reconnaissance mission from England a week before initial shuttle bombing run from Italy.

although we preferred our army cots and our very comfortable sleeping bags.

They proudly delivered to our billets the few unshattered mirrors remaining in the locality and the shiny cuspidors which they thought we needed and which we faithfully used so they wouldn't think us ungrateful. Soviet-built American latrines were the proudest display for miles around.

Poles, logs and lumber of the only type considered good enough by the Reds for the construction of our control towers,

for each person. They insisted, however, on retaining tablecloths, napkins and table flowers.

When later we shifted to American food, the Reds at some of our stations gave up their tasty native dishes and became part of our mess. We, in turn, re-adopted several Soviet dishes. As a result we continued to eat and live as well as work and fight together.

The difference in languages caused less difficulty than was anticipated. In his commendation to the entire command



Red Army women unload and assemble steel matting used to form runways at bases in the USSR for AAF shuttle bombers. The women won the admiration of the Americans for their drive and efficiency in performing hard tasks.

after the completion of the first shuttle run, General Kessler declared that despite the "difficulties of establishing new bases under unfamiliar conditions . . . you have demonstrated that the language barrier is fictitious among those who have a common objective and are willing to work unselfishly toward its attainment."

In part, we owed our thanks for the convenient situation to a corps of clever Soviet interpreters who were so anxious to talk English that we found it increasingly unnecessary to learn Russian. Among our own men, however, we had a few expert interpreters and a larger

number of Americans of Russian descent whose bi-lingual talents were indispensable to the project.

We found the best language lessons for the rank and file came simply from working and living together. In this, our enlisted men were generally more adept than our officers. After only a couple of weeks, with the help of the small U. S. Army language guide containing useful phrases, the most amazing type of conversation could be heard at our bases. It wasn't the purest form of grammar, but it served the purpose.

In one instance, we had the novel arrangement of a Yiddish-speaking Soviet

soldier and a Yiddish-speaking American GI working a ring-around-the-rosey by translating for their officers from Russian to Yiddish, from Yiddish to English, from English back to Yiddish and thence to Russian again.

Sometimes, but not often, we were blocked by the meaning of technical terms because of national differences. One of the cleverest Soviet interpreters could not quite understand one of our personnel tables because only one percent of the strength was recorded under "Labor."

"Isn't every soldier a worker or a laborer?" he asked incredulously.

(Continued on Page 44)

AFTER D-DAY

As the excitement attendant to D-day subsided and the Allied armies began the slow grind across the rain-soaked fields of Normandy, observers who had feared that air power might lapse into a secondary role in the European theatre or at least fail to produce new and interesting developments, found they were very much mistaken. In the weeks following the invasion, despite heavy tactical demands from the battle front and the worst English summer in forty years, Allied airmen produced three developments of major importance and carried one long-range strategic plan to a brilliant climax.

That plan, the destruction of the German petroleum industry, had been one of the keystones of Allied grand strategy ever since 1942 when the Germans failed to conquer the oil-rich Caucasus. The spectacular attack by five groups of Liberators on the Rumanian refineries of Ploesti in August, 1943, was the first important American thrust. By the end of June, 1944, the RAF and AAF between them had carried out attacks on all the active refineries of Germany and her satellites. It was an effort that rivaled in importance the great winter blitz on the aircraft industry of the Reich. The results promised to be equally catastrophic for Hitler and his henchmen.

Significant though it was, this phase of strategic bombing received comparatively little publicity, partly because the press was preoccupied with invasion news and partly because the airmen, recognizing that they were not petroleum experts, preferred to wait for competent oil authorities to examine the PRU photographs and make final analyses and statements. But a simple summary of the air facts involved in one of these gigantic blows serves to show the striking power of the British-based heavies.

The most devastating attack came on June 20 when a record number—very nearly 2,000—of Fortresses and Liberators were dispatched against oil plants and military targets inside Germany and against the flying bomb installations of Pas de Calais. The heavies were escorted by more than 1,100 fighters. The Germans, who had weakened air defenses in the Reich in an effort to support their troops in Normandy, offered what resistance they could but were unable to prevent major damage to twelve separate oil



By Maj. Arthur Gordon
AIR FORCE Overseas Staff

plants on which they relied for 250,000 tons per month. Nine different targets were attacked in the Hamburg area by a force of several hundred B-17s which met no enemy fighters. Liberators, attacking the synthetic oil plant at Politz, ran into the stiffest opposition from about 100 rocket-firing twin-engine and single-engine fighters. This did not prevent them from scoring direct hits on boiler houses, hydrogenation units and other vital installations. Similar results were obtained at Misburg, Magdeburg, Ostermoor and Sterkrade.

To the Germans, hampered by shortages of skilled labor and materials for repair, harassed by transportation bottlenecks caused by bombs on marshalling yards and mines in the Danube, such a day must have ranked high on the list of national disasters. Their desperation could be judged by the ferocity with which they resisted a similar attack on the Leipzig area July 7. For the first time since D-day a major air battle ensued. Our fighters caught the Germans bunched for an attack on one of the bomber boxes and shot down the astonishing total of 75, losing only 6 themselves. The bombers, at a cost of 36 Fortresses and Liberators, accounted for 39 more. The loss of 114 aircraft in one battle was a blow that the groggy Luftwaffe could hardly afford but the Germans had no choice. Their armies in the field could fight stern defensive actions with little air support, as in Nor-

mandy, or with none at all, as in Italy. But the same armies could not function without oil.

There was considerable temptation to connect these attacks on the oil industry with the lack of fuel about which Panzer prisoners taken on the beachhead were beginning to complain more and more bitterly. But such shortages were probably caused more by the disruption of communications than the exhaustion of reserves. In any case, the planners of the oil blitz refused to count their chickens until hatched. They preferred to take the long-range view, which was that every oil refinery smashed brought the end of the war closer by an appreciable period.

As for developments in the air war in the month that followed D-day, the Allies produced three, and the Germans one. The Nazi contribution, for sheer novelty, was in a class by itself. The Allies introduced triangular shuttle bombing between Britain, the USSR and Italy, large-scale daylight bombing by the RAF, and high altitude precision fighter-bombing. Meanwhile, out of their battered top hat the Germans produced their Vergeltungswaffe, or vengeance weapon, the flying bomb.

The advent of the flying bomb did not surprise many American airmen. For months Marauders of the 9th, heavies of the 8th and fighters of both air forces had been hammering at launching ramps and installations on the French coast. Flying bomb sites were usually well concealed but fairly vulnerable to accurate bombing. Bombing was so effective that when the invasion finally goaded the Germans into using the weapon it was on a scale far smaller than they had hoped. Some experts estimated that the attack was six months behind schedule and that pre-invasion bombing had reduced it to about ten percent of the intensity planned.

Defensive measures such as anti-aircraft fire, fighter interception and barrage balloons accounted for a growing percentage of the missiles launched. Some got through, grumbling over southern England like asthmatic motorcycles. Allied airmen admitted that our raids on the bomb sites gave some respite to German targets.

The British press speculated openly about larger concrete sites on the French coast supposedly designed for launching giant rockets against British targets.

Our correspondent in the ETO reports on post-invasion highlights of the air war.

Twelve-thousand-pounders dropped by Lancasters made some dents in these structures. The areas around them were literally chewed to pieces by hundreds of bombs of all calibers.

More significant from a military point of view were the three major Allied developments. The shuttle flight of British-based heavies to the USSR on June 21, a day in which over 1,300 bombers hammered Berlin and the Pas de Calais area, was important insofar as it tightened the aerial noose around the Reich and gave Americans and Russians a chance to look at one another. The aircrews, escorted by American as well as Soviet fighters, met little opposition enroute. After five days, they proceeded to Italy, bombing oil refineries in Poland without loss. A few days later, they were back at their bases in England.

Strictly speaking, the introduction of daylight attacks by heavies of the RAF was not an innovation. The RAF had been out in daylight before. But June and July attacks on flying bomb sites and tactical targets in the battle area, culminating in the heavy blitz on Caen just before its occupation, indicated the degree of air supremacy the Allies had attained. Safe from interception by enemy fighters, the lightly armed night bombers could and did carry heavier loads than Fortresses and Liberators to short-range targets. It was not too farfetched to foresee the day when German air strength would be so depleted that Lancasters and Halifaxes, with adequate long-range fighter cover, might vary their night missions with an occasional daylight thrust deep into Europe.

THE third development was announced rather quietly and almost escaped the notice of the press, which was devoting itself wholeheartedly to the flying bomb furore. Most of the papers simply ran a three-line announcement to the effect that P-38 Lightnings were now carrying out precision bombing from 20,000 feet and higher.

Details as to how this was being accomplished were still classified but the implications were highly interesting. When planes as fast and self-reliant as the Lightnings begin nailing precision targets from such altitudes, each plane carrying a pair of 1,000-pounders, thereby risking only one man for every ton of explosive dropped, that's impressive from an economy standpoint if for no other reason.

The new tactic is still in the diaper stage. At best it's a secondary function for planes whose primary job is still es-

cort work and the destruction of the Luftwaffe on the ground and in the air. But the other day a squadron of Lightnings picked a secondary target—a railroad bridge over a river—and knocked out three spans. From 12,000 feet with only sixteen planes bombing, each carrying two 1,000-pounders, that was pretty good shooting. It indicates that the big, twin-engined fighter is a steady bombing platform, that its great speed may actually make corrections during the bomb run easier and quicker, and that the bomb pattern can be easily controlled by varying formation flying. The results are not always so impressive—as usual in the ETO, problems of navigation and target recognition are the main handicaps.

The fighter is not yet likely to outshine the bomber at the bomber's own game. But this much is already evident. High altitude fighter-bombing can place explosives on targets outside the range of the mediums. It can get them there faster with more element of surprise and with smaller loss expectancy than the heavies.

It is less dangerous and likely to be more accurate than dive-bombing. It has limitations but it may turn out to be a very economical way of hurting the Hun.

The only friend that the Luftwaffe seemed to have in the weeks immediately following D-day was the weather. Rain and solid overcasts in Britain and Normandy gave Jerry a chance to patch up his communications and improve their serviceability to a point where in mid-July he began to fly a respectable number of sorties in support of his ground troops. But nobody seriously doubted that with the reappearance of good weather Allied air power would again reduce the forward German bases to virtual impotence. As the high noon of summer approached, it was evident that no matter on which front he fought, the German infantryman was going to have to meet our own foot soldiers under a canopy of Allied planes. How well he could fight under such conditions, or how long he would continue to try, was anybody's guess. Most of the guessers omitted any mention of 1945. ☆



Bad weather has been the German's staunchest ally. This photograph, taken through the open bomb bay of a B-17 over Berlin, gives an idea of what solid overcast looks like to a bombardier.

Heavies of the 8th and 15th Air Forces are striking crippling blows against the Nazi war machine in a far-reaching strategic bombing of German oil centers. Climax of the offensive was the June 20 attack at Hamburg on the Deutsche Petroleum and Harburg refineries, burning below







INVASION OF FRANCE

During the twenty critical days from D-minus-10 to D-plus-10, the 9th Air Force dispatched almost 40,000 planes and contributed a large share in the task of keeping enemy reserves from the assault area. It dropped and supplied two airborne divisions, built more than four airfields on the Continent, and destroyed a large number of Jerries and their equipment. In this and following articles, AIR FORCE's correspondent just returned from France tells how American air power played its vital, complex role in the historic assault.

By Capt. Luther Davis
AIR FORCE Overseas Staff

ON the afternoon of D-day three frightened infantrymen jumped into a foxhole on the beach and found in it a bunch of GIs wearing 9th Air Force patches.

"Jeest," said one dogface, "we didn't expect to see you air force guys for months yet."

This was the general reaction of groundlings to the large number of 9th Air Force men in France. At one time the advanced headquarters of the 9th was several hundred yards closer to the enemy than the most forward ground force command post. The AAF is in excellent repute in the assault area and our stock is riding high.

Much of this respect is due to the 9th Air Force, which was as much an integral part of the invasion as the First Army or the men who drove the Dukws. This was true from the very beginning of planning in which the 9th was given a variety of missions, varying according to the phase of operation. The plan established the first phase as preliminary from D-



minus-30 to D-minus-3, during which the 9th was "without prejudicing security of the plan, to cut such rail communications as will directly hinder the rail moves of the enemy reserves to the assault area."

To keep from "prejudicing the plan," it was decided that for every rail bridge in the critical area bombed, the 9th must bomb others outside the area. That the 9th succeeded both in its bombing and in not prejudicing the plan is proven by the fact that the entire operation is considered officially to have achieved tactical surprise and that as yet no single large enemy formation is known to have reached the battle area completely intact or on schedule.

THIS was done by many methods but the most impressive was the cutting of thirteen of fourteen road and rail bridges across the Seine and a like number—under the security plan—across the Meuse. All but one of these were bridges cut by the 9th's fighters and bombers which also succeeded in keeping the enemy from repairing the damage.

As an example of the work done in this preliminary stage, let's take one typical day, D-minus-10, and see what the 9th was up to.

On this day the fighters flew 260 sorties as escort to 9th or 8th Bomber Commands, made 15 reconnaissance flights and dispatched 154 aircraft to drop a total of 15½ tons of bombs in dive, glide and skip bombing of airdromes, bridges and marshalling yards. On the same day 261 B-26s dropped 516 tons and 73 A-20s dropped 72 tons of bombs on airdromes, bridges and marshalling yards. All of this occurred on a fairly typical day of the preliminary stage with typically abominable weather.

The blasting of airdromes was covered by a statement in the plan that the 9th "will render all enemy airdromes within a prescribed distance of the assault area unserviceable." The idea was that the Luftwaffe would then operate under the same disadvantages as our England-based aircraft. This the 9th did not quite do because the Germans repaired their fields with astonishing swiftness, but, in making it unsafe to keep planes or fuel on these airdromes, the 9th forced Jerry to operate from distant fields and thus succeeded in the tactical terms of the task assigned to it.

Also, as a part of the preliminary phase, the 9th was given 21 coast defense batteries to work on before D-day-minus-3. Because of the security plan only seven of these 21 were in the assault area—two outside the area to one inside. The 9th's fighters and bombers gave these 21 targets a message such as has rarely been seen.



B-26s of the 9th Air Force smash rail junction behind German lines, preventing Nazi troop movement.

Some they destroyed but others were situated in concrete ten-feet thick. These General Brereton's boys pestered so thoroughly that Jerry prisoners now tell us that life in them became impossible. Communications and precision aiming instruments were so snarled and shaken that all were in a state of disrepair when our fleet arrived—and unloaded with astonishingly low casualties. Jerry knew what was happening and placed ack-ack around the guns in solid masses. In the main, the bombers just let them fire but when things were too tough, fighters dive-bombed the emplacements to keep the gunners' heads down while B-26s and A-20s worked. The answer is that the losses in the 9th have never gone above three percent.

During this stage the 9th's bombers

and fighters continued to attack enemy marshalling yards in France and in the Low Countries as a part of an overall plan of weakening his communications before D-day, keeping him from bringing materials for construction into the area, and as a means of making him use his marginal forces of labor in repairing rail routes when Jerry would much rather have set them all to work digging tank traps and emplacements along the coast. This attack on the western European rail system was the longest and most intense any railway has undergone. It started on February 9th, and between then and D-day, the 9th's bombers and fighters dropped 54,000 tons of bombs on targets in this category, completely destroying 13 marshalling yards, knocking out between



Big job for 8th Air Force heavies on D-day was hitting vital German installations. These Liberators unload their bombs on target with help of smoke marker probably dropped by lead plane.



On its way to hit a target in northern France, an A-20 passes Allied vessels bound for France.

50 and 60 locomotive depots (confirmed,) and wrecking more than 1,700 locomotives and 25,000 railroad cars.

All this had very salubrious results. For instance, we now know that this widespread damage caused stocks of coal vital to the war industries and to the trains themselves to be reduced to a day-to-day basis at most French stations; the repair shops, already over a year behind on routine maintenance and repair, were further discouraged and put behind while Jerry was forced to repair the trackage by tearing up rails elsewhere—hardly SOP in keeping up a railroad.

A FRENCH railroadman whom this correspondent interviewed in Bayeux said about his problems: "After a raid on one

marshalling yard, traffic frequently would be stopped for 100 miles around because signalling was made impossible and because all hands and equipment would be busy repairing the damaged area. The Boches had counted on robbing our railroads to keep up their own and the ones they needed in Russia, but instead they had to rob their own to keep up ours. It was magnificent."

The scale of effort slowly increased through this stage until we reached the preparatory stage (D-day-minus-3 to D-day.) Here the effort became all out on Seine bridges, finishing up in a blaze of glory with an even heavier pasting of the guns in the Cherbourg area. Throughout this stage the scale of fighter-reconnaissance flights was increasing from about

450 sorties per month to D-day, on which day the 9th alone flew nearly 250 reconnaissance flights.

In the preparatory stage, the 9th fighters and bombers went against more specifically tactical targets such as enemy headquarters, enemy fighter control stations, radar emplacements, road junctions and strong points on the beach—but still working under the security plan and not tipping their mitts.

All of which brings us to D-day itself. Bombers of the 9th were briefed on six special coast defense emplacements on the beach and on sixteen other strong points and told to hit them between H-hour-minus-30-minutes and H-hour. Coordinated with the bombers were the fighters who were given twelve batteries in the same area and told if they couldn't find them to get whatever was firing.

BECAUSE of their small size, these targets required good visibility, so you can imagine what was in the minds of the aircrews when they took off at four in the morning of June 6 with a ceiling of about 1,000 feet and visibility strictly non-operational. The only possible answer was for the mediums—which had been working at 12,000 feet since a year ago when their first low-level raid cost them 100 percent at Ijmuiden, Holland—to go in on the deck. It was a tough decision but the boys carried it out and did it brilliantly. One naval observer says, "Solid packages of explosives seemed to fall right on the spots that had been worrying us most. As for those fighters, they came screaming in out of nowhere and unloaded so low I could actually see them being blown about by the blast."

Throughout what is called the Assault Phase (D-day through D-day-plus-1) the fighters were everywhere. The plan called for them to provide a curtain of P-47s for high cover over the beach, and P-38s as a part of the convoy cover. The Fighter Command also was charged with coordinating the participation of several groups of 8th Air Force P-38s in the convoy cover—the P-38 was chosen for this because it is so easily recognizable and we wanted no mistakes.

The Fighter Command also had to provide several groups of P-38s and P-47s for direct support of the ground forces, for bomber escort and for special request missions as they came up. The P-51s were briefed for special reconnaissance flights deep into enemy territory to see what was coming toward us. But that's not all—the fighters also had to provide escort for the 9th Troop Carrier's operations.

Having done their best to the coastal batteries and strongpoints, the medium and light bombers of the 9th Bomber Command were to attack enemy concentration areas, reserve areas, communications and motor transport, delay movement of enemy reserves and isolate fur-



ther the battle area. This area for us was roughly bounded on the north by the Seine, on the south by the Loire and in the east by a rail line running from the Seine to the Loire—known to the back-room boys as the Paris-Orleans gap. While the 9th's bombers massaged the actual battle area, they also went to work cutting the main line between Paris and Orleans. Later the 8th and RAF heavies went to work on the more distant Loire line. In this connection there is a story of a full German Panzer division which was seen by P-51 reconnaissance planes trying to get from northeast of Paris, around Paris and into the fight. Fighters and bombers went to work and that division is called destroyed—without ever getting within quaking distance of the main fight.

ON D-day alone, the 9th Air Force flew 4,354 sorties, as compared with 2,153 on May 18, previous biggest day. And they were flown in the face of weather that would normally keep any sensible air force quietly on the ground.

As for the weather we fought against, Col. Thomas S. Moorman, Jr., staff weather officer for the 9th, has this to say: "On only three of the ten days (D-day through D-day-plus-10) did we have the weather conditions which we consider optimum for medium altitude bombardment." Nevertheless, we went right on flying and on D-day-plus-1, the 9th beat its own D-day record by flying even more sorties—4,796. During the ten days that Colonel Moorman mentions, the so-called medium altitude bombers operated eight days and the fighters operated nine. Needless to say, there isn't much blind bombing you can do with friendly troops all over the place and consequently both fighters and bombers went in under the clouds—some B-26s bombed at 900 feet and the fighters practically moved around on their hands and knees.

During the ten days after D-day, fighters and bombers did what they had done on D-day except that by D-day-plus-7, the 9th Engineer Command had fields on the Continent from which fighters could operate during daylight hours. The fighters went in for something called "armed reconnaissance," which the Germans have learned plenty about by now. The technique is to put several groups on that assignment for a day, letting them relieve each other, and keeping someone up at all times. The reconnaissance comes in finding some Jerry motor transport or troop trains and the armed part is bombing and strafing it. The boys go in on everything, even single staff cars and motorcyclists. The usual practice is for a group to stick together—because when

Jerry jumps us he almost invariably does so in force—and for a certain percentage of the group to be unbombed, operating purely as escort.

There have been some German fighter reactions but on the whole his interceptions have been rare and fighter pilots are pretty browned off at not being able to run up scores. The main danger in these low-level operations is from ground fire since Jerry shoots everything from 88s to pistols at us. The losses, however, are not proportionately high although battle damage keeps maintenance crews busy.

Some of the typical problems besetting



During a visit to the Normandy front after D-day, General H. H. Arnold discusses the invasion with Lieut. Gen. O. N. Bradley.

fighter pilots can be seen from the following report of a post-D-day operation by some P-51s operating from England. They took off briefed to attack a railroad junction in the battle area and thereafter hit targets as the opportunity arose. When they arrived at the target they found the tracks torn up and locomotives smoking from a previous attack by other 9th Air Force planes which had foully got there first although definitely briefed for some other target. So the flight cruised over the area until one squadron leader saw some gasoline storage tanks hidden in a woods near the railroad. They all cried tallyho, but the first two planes down set them exploding and burning which left the rest of the group with nothing to shoot. After almost half an hour of cruising, one flight leader saw some gasoline trucks hidden in the shadows of some

trees along a roadside. They were promptly strafed and burned. Later another pilot saw what appeared to be six halftrack armored vehicles on a road and took his flight down to strafe. Although they got several on the first pass, sudden unexpected fire from the trees on either side was quite disconcerting and made it seem possible that the whole set-up was merely a trap. The group commander did some talking and arranged it so one squadron would strafe the ack-ack in the woods while the others shot up the road. Within three minutes all the halftracks were orange with gasoline flame and only one of an estimated twenty AA guns was firing.

The 9th Bomber Command continued to go in as low as the weather dictated, one group having stooged around at 1,000 feet and still missed the target. A typical day for air support was seen on June 15 when the 9th was following the air support plan worked out by higher headquarters. The plan was: (1) to support the American Fourth Infantry Division and Seventy-ninth Division in a drive north of Montebourg; (2) to protect the southern flank of the American Ninth in their drive toward La Haye Du Puits; (3) prevent attack of a German parachute regiment at Carentan; (4) cover withdrawal of a British division from the Caen area; (5) attack and prevent enemy movement at Caen; (6) prevent enemy attack toward the eastern flank. As their part of this plan, B-26s and A-20s were assigned eighteen targets. They attacked twelve of these in the morning from zero feet and the six others in the afternoon from what one pilot called "submarine altitude."

The measure of success for all of us, from an aircraft worker in the United States to a line chief in Normandy, is that the invasion succeeded.

THERE is little doubt among staff officers here that if Jerry had been able to devote his labor in France to improving his defenses instead of repairing damage, had employed his air force in the manner and strength he had planned years ago, had moved his troops speedily and at will, our entire plan would have failed or have been postponed for at least a year. And the measure of the success of the 9th in particular is that if they had failed, all the good work of the rest of the team—yours and mine and the Forts and everybody's—would have failed, too.

They succeeded, as even Herr Goebbels admitted when he said, "Our troops are helpless against the overwhelming superiority of the American Air Force which is continually over the battle area in great strength." ☆

PLEASE pass this copy of AIR FORCE along! Share the service journal with every man in your unit.



The thorough treatment given airfields of the Luftwaffe in France is demonstrated in this photo taken shortly after heavies of the 8th Air Force had paid the area a visit. These attacks on Nazi airfields located

within striking distance of the invasion sector helped keep the skies clear of enemy aircraft. A string of Nazi trucks is shown on the highway at left in this photograph taken by an 8th Air Force reconnaissance plane.

Near Quineville, France, this heavy concrete fort with its large caliber coastal gun was shattered by air force and naval bombardment.

The photo below is striking evidence of the effectiveness of an RAF night attack on a marshalling yard located in a small French village.





OUR FIRST FOUR AIRFIELDS IN NORMANDY



French soil gets a coating of landing mats as AAF engineers ready a Normandy landing strip for business. Note invasion-marked planes at left.

A 9TH AIR FORCE pilot, flying an unarmed Cessna C-78, tried to land on the main Cherbourg airport more than a week before Cherbourg fell. Asked how he'd ever mistaken that large permanent airdrome for one of our advanced landing grounds, he said, "I hadn't been in France for two days. We build 'em awful fast, you know."

Not quite that fast, but he's right—awful fast.

Personnel of the 9th Air Force's Engineer Command clambered out of their assault boats on D-plus-1 with German 88s only fifty yards away. They found that the real estate chosen beforehand for their first emergency landing strip was still in enemy hands, so their commander, Lieut. Col. John J. Livingston, borrowed a half-track armored car and went shopping. Pretty soon he found a likely spot near the beach. There followed a day of talking the ground forces into letting us use it for it had been earmarked as a bivouac area. These discussions went on until the early morning of D-plus-2, when the ad-

Thanks to the 9th Air Force's own 9th Engineer Command we had airfields in Normandy before Jerry was sure we had come to stay. There was an emergency strip on D-plus-2 and real fields on D-plus-7.

vance detachment of Colonel Livingston's engineer aviation battalion went to work. There were 28 men, two bulldozers, two motorized graders and one two-and-a-half-ton dump truck.

Also, there were Jerry snipers who winged one of the 28 and frequently forced the entire detachment to stop work and make with the MIs. In these fights the engineers took three prisoners, killed one Jerry (confirmed), plus many other probables. The field in which they were working had large signs all over saying "ACHTUNG! MINEN" so they had to

search carefully for mines. They found fewer than they expected. They also had to worry about occasional Jerry artillery fire and the continual hazard of the First Army's L-4s and L-5s which kept landing and taking off throughout the construction.

Despite all of this, a hasty emergency strip was ready by noon the same day and some of the heavy equipment could be sent on its way to a new site. In the meantime more men and machinery had arrived and events at the second site—which was slated to become an advanced landing ground—moved swiftly. Here, there was the same hazard as at the emergency strip plus quite a bit of German aerial activity at night—strafing, bombing and photographing in the light of flares. Our casualties from all these sources were nil but on this new job a bulldozer hit two Teller mines which hadn't been disposed of for some reason. The explosion didn't hurt the driver at all and damaged the equipment only superficially. However, the noise brought a dozen or so running to the scene of the

accident and one of these bystanders set off a Jerry "S" mine—known familiarly as a "Bouncing Betty" because it pops into the air and explodes above head level. Betty injured nine men, killed nobody.

While this work was in progress on the ALG, men left behind at the emergency strip were busy extending it to 3,600 feet, fitting it with marshalling areas and taxiways. Thus, although it's called an ELS, the first strip is a great deal more and is actually used as a transport field. On D-plus-3, at ten in the morning, C-47s of the 9th Troop Carrier Command landed there and picked up wounded for air evacuation. For the historically minded, this was the first scheduled use of an Allied airfield in France in this invasion. Since then thousands of wounded have left from this field and it serves as an airport for visiting brass.

Now the plot thickens. While Colonel Livingston's men were finishing their transport field and beginning their advanced landing ground, other parties arrived and started work on more fields. A detachment of an engineer aviation battalion under the command of Maj. Donald A. Parkhurst landed on D-plus-3 and went right to the site which had been chosen for them on the basis of pre-invasion aerial photographs. There were 642 men and plenty of equipment; their troubles with the enemy were few although six Germans surrendered to Major Parkhurst—who was surprised but willing—and men of the outfit took other prisoners.

On the other American beach, the one on the Cherbourg Peninsula, men of a battalion under the command of Lieut. Col. Max G. McCrory landed on the morning of D-day. They stepped off the boats in the face of enemy mortar fire, but the advance detachment headed straight toward the assigned site. This scouting party of nine men found the site all right, but also found a German four-inch field piece barking away less than a hundred yards from the end of the proposed strip. Master Sgt. Charles A. Lane, leading the detachment, decided the enemy was probably interested in bigger game, so he and his intrepid eight solemnly went about the business of walking the center line—marching down the middle of the property looking for fills, holes, obstructions—in full view of the Germans. They got away with it.

They completed an ELS on D-day, and by D-plus-2 work on a larger field was going hell-for-leather, almost completely uninterrupted by enemy action. The three outfits mentioned above were not exactly in competition, but each knew what the other was up to and the result was, say, stimulating to all. By 0600 on D-plus-7 Major Parkhurst's men had their field complete enough to be called a refuelling and re-arming strip and at that time a

squadron of P-47s came in for gasoline and ammunition. By evening of the same day Colonel Livingston's men got a bunch of P-47s which landed for the same purpose. This field, Colonel Livingston's men staunchly maintain, was ready much earlier but they couldn't lure any planes in—"except those damned little cubs which don't count."

In the early afternoon of D-plus-9 Colonel McCrory's field entertained two squadrons of P-47s and the 9th Engineer Command could report proudly that four fields, each capable of servicing, refuelling, rebombing a group at a time, were actually operating in the American zone in Normandy. Consequently, we're afraid there's going to be a discussion for years about whether Colonel McCrory's, Colonel Livingston's or Major Parkhurst's men got there first. Of course other battalions and detachments of battalions had been landing in the meantime and starting work on fields of their own. Each of the battalions mentioned above had sent advance parties ahead to begin work on other sites—so the report "four fields ready" doesn't tell the whole story. Moreover, each of the four strips was being improved by addition of hardstandings, surfacing and so on. In this connection, here is the phasing through which a typical strip goes, and the specifications for each phase:

(1) First comes an Emergency Landing Strip (ELS), which is supposed to be "of sufficient length and level surface to enable aircraft in distress to land."

(2) Then a refuelling and re-arming strip (R and R) "of sufficient length of level compacted surface for landing and taking off, with adequate marshalling areas for rapid turn-around of aircraft, adequate tracking to insure operations under all summer and autumn conditions." In practice this means the aviation engineers must clean, grub, grade and roll a runway 3,600 feet by 240 feet with a 450-foot by 240-foot overrun at each end.

(3) Next step in the life of an airfield is when it becomes an Advanced Landing Ground (ALG) which requires the following improvements:

(a) Clean, grub, grade and roll two 300-foot by 150-foot marshalling areas at each end.

(b) Clear obstructions in approach funnels to permit a minimum glide of one in thirty.

(c) Surface the marshalling areas—in our Normandy operation surfacing so far has been with square mesh, a chicken wire metal mat of British manufacture.

(d) Surface the runway 120 feet wide.

(e) Add taxi tracks.

An ALG is defined as about the same as an R and R but with additional dispersal facilities so that it can be used to capacity by "flying in squadrons to replace others as they complete the scale of effort appropriate to the period."



Men of 9th Engineer Command using graders.



First P-38 lands on newly finished strip.



Fighters are rearmed at Normandy field
Landing strip completed. C-47 lands jeep.





When an ALG gets so complete and homey that a group can just move in and stay, it is said to have become an airfield.

Most of the fields mentioned here are now ALGs and some are definitely airfields. What with censors and with the engineers working so hard that everyday the situation changes, we can be no more specific than that. Suffice it to say that our operations are not being delayed by lack of landing facilities on the Continent—and that's what the 9th Engineer Command was set up to insure.

Just in the light of the job the 9th Engineer Command has done in France, consider the fact that in 1939 the entire engineer complement of the Air Corps was one officer and three enlisted men assigned to GHQ Aviation. Enter, in June 1940, the 21st Engineer Regiment, a general service engineer outfit, which was then turned into the 21st Engineer Regiment (Aviation) and is the unquestioned sire of all engineer aviation battalions.

It has been split and resplit to form cadres for all the separate battalions which are the basic tactical and administrative bodies of the aviation engineers; early experiments carried out by and on the men of the 21st resulted in the present organization of engineer aviation outfits.

First of all, these are about one-quarter again as large as conventional engineer battalions and, in the second place, they're equipped for specific jobs concerned with airfields in addition to bridge-building and demolitions. Their TOs are on the basis of double shifts for each piece of critical equipment, and their armament—which includes plenty of .50 calibers on both antiaircraft and machine gun mounts, bazookas, 37 mm cannon, rifles or carbines for all—is predicated on the idea that they may have to defend airfields against air attack or ground action.

By Pearl Harbor we had twelve separate battalions plus the basic regiment, but the April immediately following—April, 1942—General Arnold ordered twenty battalions to England, to be shipped on a priority higher than that given combat groups. In addition, battalions had to be sent to Panama, Puerto Rico, Alaska, Hawaii and Atlantic bases.

The outfits that came to the UK were assigned to work on airfields for the 8th Air Force—although a few were sidetracked to the Mediterranean—and for this work loaned to SOS. They completed the first runway made completely by American labor in the British Isles on December 7, 1942 and the first whole airdrome made by American labor in UK in May, 1943. Thereafter, they built twelve complete airfields in England and



Truckloads of five-gallon cans of gasoline are unloaded at an American airfield in France. Supplies of gasoline and stores of ammunition enable our men to service fighters operating from the strip.

renovated most of the others, since our heavies were breaking up runways as if they were made of match wood.

Which brings us to the 9th Engineer Command which became a part of the 9th Air Force in March of this year. The new outfit was to get its strength from the battalions which had been working for SOS and to perform the following missions:

- (1) Engineer planning for the support of the 9th Air Force in the invasion of Europe.
- (2) Provide refuelling and re-arming strips, advance landing grounds, field airdromes, tactical air depots on the Continent.
- (3) Assist in camouflage of 9th Air Force installations in England and in France.
- (4) Mark, repair, maintain 9th Air Force airdromes.
- (5) Help the 9th Air Force with such problems as water supply, and road maintenance in forward areas.
- (6) Provide mine and booby trap locating service for 9th Air Force units in Europe.

To accomplish them, the commanding general of the new command, Brig. Gen. James B. Newman, Jr., had quite a job of training on his hands. Men who had done nothing for months but build super

concrete airdromes had to be retaught the technique of hasty construction; men who had grown fat on British mild and bitter had to be taught to fight. Finally, the outfits had acquired a lot of heavy equipment for use on the fields in the UK, and they had to be re-equipped in accordance with their own TBAs.

The upshot of the whole thing, in tactical terms, is that before the Germans were sure this was really an invasion, 9th Air Force fighters were able to take off from the UK at first light, bomb and strafe to the limit of their gasoline and ammunition, and then land less than ten miles from their targets. Basing on the new strips for the rest of the daylight hours, they could make as many as seven sorties before it was time to go back to England for a safe night's rest and clean drawers. Shortly thereafter, outfits were able to move over to the far shore, onto fields with plenty of hardstandings for dispersal, and settle down until the engineers had new strips, even closer to the enemy.

Of course these fields aren't luxurious—the engineers will admit that—and the dust is something to make ground crews spit mud. But a lot of our boys owe their lives to the miraculously swift construction—and a lot of Germans can charge their deaths to the same thing. ☆

H-HOUR MINUS FOUR AND A HALF



The 9th Troop Carrier Command made history by carrying out the largest airborne operation ever attempted—and by doing it with maximum efficiency, minimum loss.

TROOP CARRIER has done it. All the great promises of Troop Carrier, all the hopes which its champions have had for it, have been richly, triumphantly fulfilled. If this sounds like intemperate praise, look at the record. In the cold darkness before H-hour, 9th Troop Carrier Command dropped behind the enemy's forward defenses two Airborne Infantry Divisions, the 101st and the 82nd—dropped them in the area they were supposed to have been dropped—and did it with a total aircraft loss of less than two-and-a-half percent. In four hours, two aggressive divisions with essential equipment were where the enemy wanted them least. Compare, if you want to, our aerial loss with the Germans' at Crete when more than twenty percent of participating planes and gliders were destroyed. Troop Carrier is taking a lot of curtain calls today, thanks to the near perfection with which 9th Troop Carrier Command did its job.

THE PLAN

To understand how well the operation was carried out, you should know the plan: "to begin about four hours and thirty minutes prior to Civil Twilight (the pre-dawn) to assist in the initial assault." That was the assignment of the 101st American Airborne Division while the 82nd was "to land to the immediate west of the 101st to prevent movement of enemy reserves to east and west."

Timed with our vertical landings were British operations involving one airborne division. Using Albemarle, C-47s (the

British call them Dakotas), Sterlings, and Horsa gliders, the British equivalent of 9th Troop Carrier established protection for the left flank of the British beach by dropping its airborne load just where it was supposed to, at the set time and with aircraft losses actually slightly less than ours. For both nations, Troop Carrier made its mark.

THE OPERATION

On 5 June 1944 at 2154 hours, Lieut. Col. Joel L. Crouch, commanding officer of a 9th Troop Carrier Command pathfinder unit, reported his C-47 airborne. For the historically minded that's the time the first plane was up—the tactical beginning of the liberation of Europe. Crouch and the two planes he led crossed the enemy coast, on the west shore of the Cherbourg Peninsula, at 0006 hours 6 June—D-Day. At 0016 hours Crouch dropped a stick of paratroops. He thinks, unhappily, that he was 400 or 500 yards off dead center.

There were six drop zones and there were six Pathfinder formations to mark them, each consisting of one flight. The specially trained crews of airborne infantry carried by these planes established certain radio navigational aids on the drop zones and showed marker lights for the guidance of pilots of the main column.

Starting with Colonel Crouch the operation proceeded through 26 separate formations (called "serials" by Troop Carrier personnel) of paratroop-carrying planes, totalling 821 aircraft. After them came serials 27 and 28 totalling 103 more planes each of which towed one CG-4A

glider. The paratroop-carrying planes transported payloads of 5,850 pounds including containers, supplies, equipment and troops. Once over the sea they conscientiously gave the Navy every recognition signal they could think of. Despite the fact that our navies were all over the channel there was no repetition of the Sicilian error in which the Allied navy shot down Troop Carrier planes.

As special equipment, our C-47s had flame dampers on exhaust outlets, the best navigational equipment that could be devised and flak suits for the crew. There was no other armor or armament, and not one ship had a self-sealing gasoline tank.

AIRCROWS were up for between three-and-a-half and four hours during which time they, without exception, flew magnificent formation, navigated so well that there was not a single case of seriously mistaken drop, and they maintained radio silence assiduously. There were no lights in any of the planes, aircrews were dark-adapted, and the only noise, aside from that of the engines, came from the paratroops, most of whom sang all the way out. There were no abortions or turnbacks short of target, although one pilot made two passes and still couldn't find a DZ, so he brought his cargo home. Not more than a dozen other paratroops were brought back to base—all of them men who had been wounded by flak or small arms fire.

The last paratroop serial, No. 26, dropped at 0244 hours while the first paratroops of the main column (as distinguished from pathfinder crews) dropped at 0050 hours. The split-second timing in between was based on an air-speed of 150 miles per hour except at drop. Naturally, glider tows made their approach considerably slower, although they carried no interior loads. Their CG-4As had payloads of 3,750 pounds, composed of troops, vehicles and equipment.

Weather varied throughout the operation, but in the main it was favorable. Early planes reported ceiling down to about 1,000 feet despite the fact that forecast had been for a 3,000-foot ceiling. Later crews found ceiling going down as low as 500 feet—necessitating blind drops—while others found it up to 3,000 or

(Continued on Page 20)

INVASION



Dawn of D-day found the fields of Normandy littered with parachutes and gliders which in the cold darkness before

H-hour had landed one British and two American Infantry divisions—the 82nd and the 101st—behind the Germans'



forward defenses. The lead planes of the Troop Carrier Command crossed the invasion coast at 0006 and dropped

the first paratroopers at 0016. They landed where the enemy wanted them least, with a minimum of casualties.



4,000 with moonlight breaking through. Wind was fresh but not strong; visibility good.

Earlier that evening the entire area had been prepared by as heavy an aerial bombardment as could be dared without giving the whole show away. Tactical surprise was counted on—and achieved. All planes reported flak and two or three were seen to go down in flames, but the concentration of fire which the enemy could have mustered had he known what was coming was definitely not there.

Fighter cover—not escort, but high cover—was maintained over the entire area and a small force of Mosquitoes hung around, bombing, dive-bombing and shooting at flak emplacements and searchlights. They rambled all over the coast and caused a few C-47 pilots to report enemy night fighters. They kept a lot of German heads down.

As for enemy ground interference, there was some worry about things called air landing obstructions which Jerry had placed all over the Cherbourg Peninsula. These are posts about ten or twelve feet high planted in likely landing zones. Some are pointed at the top and they frequently have barbed wire stretched between them. However, we know of no case in which our airborne loads were dumped on these obstructions.

The gliders worried the command most because they came last of all—when presumably the enemy would be alerted—and because they had to fly so slow. However, only one tow plane was lost and only four gliders were prematurely or improperly released. Their job was finished at 0408 hours, and Troop Carrier was through for awhile.

Began then what will always be re-



At an airfield in Britain, C-47s are lined up beside Horsa gliders which they towed over the Channel.



C-47 hospital plane picks up wounded at advanced field in Normandy. Plane can carry 24 stretcher cases.

membered by a lot of us as the great sweating-out. There was for a long time no way to know what was happening to the men we'd dropped. The only signal received from the airborne troops was a panel marker placed at the appointed place and the appointed time indicating where they wanted resupply and reinforcement.

This operation, which had been decided on as part of the original plan, began before dusk on D-Day. Two hundred and eight C-47s towing 172 Horsa gliders of British manufacture (carrying 6,900 pounds) and 36 American CG-4As crossed the Channel between 2110 hours and 2310 hours. The gliders carried additional elements of the airborne divisions already landed as well as items of resupply—ammunition, food—and some heavy equipment to our waiting troops. The following morning, D-plus-1, 48 Horsas and 150 CG-4As were released over the same spot; 249 other C-47s dropped supplies. Thus the air phase of the airborne operations to "assist in the initial assault and prevent enemy troop movements from east to west" ended at 0900 hours on D-plus-1. The entire operation had involved 1,371 sorties by 9th Troop Carrier planes, plus 301 by gliders.

OPERATION BACKGROUND

Basically, the operation succeeded so brilliantly because 9th Troop Command

received what every Troop Carrier outfit has been seeking since the beginning. For once, a troop carrying organization was permitted to devote itself to training for its combat assignment instead of indulging in freight-hauling right up to the moment of action. The 9th had its own equipment and was not forced—as in the early Mediterranean operations—to use mixed, tired and foreign aircraft. Moreover, the high command planning for the operation took into account the various special requirements—adequate time in which to prepare for the particular operation as well as for operations as a team under varying conditions, a well-marked route to objective, fighter protection and bombardment diversion.

Coordination of the pre-invasion training and of the actual D-Day operations was achieved through the Allied Expeditionary Air Force Headquarters which controlled both 9th Troop Carrier Command and its RAF equivalent. The 9th remained under the 9th Air Force for administration and discipline, but this channel was by-passed for operations—orders went straight from AEAFF to 9th TC.

Troop Carrier, after years of being mistaken for the Air Transport Command (which properly has no part of carrying through and into combat—Troop Carrier's job) and after suffering a great many lean days, made the grade—with plenty of room to spare. ☆

Raising great clouds of dust as they skid in on their bellies, gliders with men and equipment land on partially completed field in France.



BLAZING THE TRAIL ON D-DAY

Here is how the Pathfinders led the successful Troop Carrier-Airborne Infantry operations on the Cherbourg Peninsula



Crew members of the lead pathfinder plane were (left to right): Cpl. H. E. Conrad, radio operator, Capt. E. E. Cannon, flight surgeon, Capt. W. Culp, navigator, Capt. V. S. Pedone, co-pilot, Lieut. Col. J. L. Crouch, pilot, who directed pathfinder training for the 9th.

ONE of the most important jobs in the invasion was that of Pathfinder units which pointed the way for troop carriers and gliders. Much of the work of the Pathfinders is secret, but here, in an interview obtained just before D-Day, Maj. James T. Blair, Jr., executive officer of a Pathfinder unit, tells considerably about the duties of his crews:

Our job, briefly, is to do for Troop Carrier planes taking troops into enemy territory what RAF pathfinders do for their night bombers—mark the target so the main forces can find it without delay and without error. In other words we go first—and we've got to be right.

To do the job we have planes and crews carefully chosen from among the best in all the groups that make up 9th Troop Carrier Command. They're grand boys who knew their stuff before they came to us and who since have been trained and re-trained in their tasks. In addition, we have some special equipment to help us navigate—the very best equipment that Allied engineering ingenuity can produce. (Right now—a few days before D-day—it's all secret and we're practically writing this in a whisper for publication after we've done the job. Until D-day even the fact that our Pathfinder outfit exists is secret.)

Our commanding officer is Lieut. Col. Joel L. Crouch who was a United Airlines pilot before the war and who knows flying as well as it can be known.

He was with a Troop Carrier wing in Sicily and he understands how important our job is, understands from experience. It's no secret any longer that—due to a variety of causes which I won't discuss here—some of the airborne personnel Troop Carrier delivered in the Sicilian campaign weren't put down where they were supposed to have been. This time

it's got to be different and here's how we mean to do it.

Ahead of the main column will come a flight of C-47s provided by and manned by our unit. There'll be this kind of a spearhead for every drop zone on which troops are to be delivered.

Presumably the mission will be at night, undoubtedly over strange territory, and probably in the face of enemy opposition. It's the job of this lead flight to hedgehop in at 500 feet or so, keeping under the enemy's radar field, fly directly to the 500-yard-by-500-yard area assigned them and drop special Pathfinder teams of Airborne Infantry at precisely the right moment—neither a second too late nor too soon.

In each Pathfinder plane there will be the usual crew—pilot, co-pilot, navigator, radio operator and crew chief—but all trained for the special job; the crew of each ship will work out the problem and be briefed to carry on in case the other two don't get there. To guard even further against accidents, the main body—flying behind us—will be led by another flight of our boys.

Each aircrew member will have had between thirty and sixty hours of special Pathfinder instruction—minimum—and some a great deal more. At least a third of our men are veterans of the African, Sicilian or Italian campaigns.

The course consists of ground instruction on the purpose and tactical employment of Pathfinder and on the theory behind the special equipment we've been given. After that come instrument flying refresher courses, reviews of dead reckoning theory and practice, and then hours of flying as part of joint exercises with the Airborne Infantry who'll ride with us and jump out when we tell them to. Once on

the ground the infantrymen have to set up radio and visual aids. No less than we, they have to know what they're doing.

Let's say the Pathfinder crews for a certain drop zone have reached their target. The pilot gives the jump-master the green light and a dozen or so parachutists who have trained with us for months pile out of the open door of each plane. They have lights they can set up. These might be just flashlights making a prearranged signal, flares or something called Hollophane Zone Indicators. These are electric lanterns with great range so made that they can be seen only from one direction—not from the rear or directly above. There are two separate cones of light to tell pilots, approaching along the correct course and at the designated altitude, when they're getting close to the zone.

We're the first Pathfinder unit for Troop Carrier activities in the world. (That is on the Allied side. Possibly the Germans have something like it, but we've never seen any signs of it.) However, we owe a lot to the British who first established Pathfinder organizations to drop flares on targets for night bombers. Much of our navigation equipment was devised by the British for such use, and some of our tactical ideas are the results of British experience in this kind of work.

Setting up the Pathfinder units was actually accomplished by the 9th Troop Carrier Command under Brig. Gen. Paul L. Williams. He instructed each of his groups to turn over to us three of their best C-47s with complete crews. That commanders were willing to give us first rate material—instead of indulging in the old Army game—is the best testimony I can think of to the importance of our mission. They *know* now that if we do our part well, the whole show will succeed. ☆

INVASION



Invasion of Europe by the AAF actually began long before June 6. Since August, 1942, German industries, airfields had been under attack by heavies of the 8th and later the 15th Air Forces.

The invasion is on! And the effect of that announcement is shown in the faces of these airmen.



This packed field at Pau, France, was hit during the furious air offensive preceding D-day.

After weeks of rehearsal, the 9th's mediums covered the Channel on the big day, giving





Low-level attacks took the Nazis by surprise. Though losses were extremely light, a few planes, like this flak-fired A-20, were downed by the enemy.

direct support to the endless stream of Allied vessels and pounding German coastal defenses.

D-day over, the AAF continued its assault on installations behind the German lines and industries far into Germany. This shattered bridge in France was hit on June 11 by our heavy bombers.



MAINTENANCE FOR KEEPS



By Master Sgt. Arthur Jolly
13TH AIR FORCE



**A story of lessons learned
the hard way by mechanics
at advance tactical bases
in the South Pacific Theatre.**

BACK home, if you're stuck on a job or in a rush, you can call upon the shops in the hangars. At an advanced tactical base in the South Pacific you either call upon God or your men—and often upon both.

You get a great deal of relief and satisfaction, however, when the engineering section chief knows his job thoroughly and works in perfect harmony with the engineering officer, the line chief and the crew chiefs. It does no good if every part of a plane except one functions. That plane will fail and the man who fell down on his job is responsible for the fate of a plane and, more important, for its crew. That responsibility hangs heavily over every man who works on the line at all times.

Ours is the oldest medium bombardment squadron in this theatre; it has been operating here almost since the start of the war. We have gone through plenty and we have made as many, if not more mistakes than most outfits. We have tried to benefit by them and to improve

constantly our technical skill. Our greatest assistance has come from the TOs and other information provided by the Air Service Command. But not even a man with a VHF crystal ball, suspended by the latest gyroscope and fixed on a true magnetic north, could have foreseen some of the heart-breaking events we have encountered.

The essence of a ground crew is teamwork. In the more than three years that this outfit has been operating our ground men have never stood a formation or had to answer a roll call. They've always been on the line long before they were scheduled. They've worked days and nights and never has their morale been better than when they were under actual combat conditions where they could see the results

their planes were accomplishing.

Each of the section heads is a specialist carefully chosen before we came overseas. The rest of the men we picked up were not specialists. But they soon became so under the guidance of their sergeants. It has been easy to teach these men. In the first place they came to us highly skilled from the various schools of the Training Command. Almost all of them were well educated, having gone at least through high school. And most important of all they were Americans with a great gift for all things mechanical. Ours is a far different group of line men than we were in the old days when everything we did in the Air Corps was experimental. We used to argue about all technical procedures. Now, through the TOs we know. There is no guesswork about it.

In our squadron each plane has a crew chief and at least one assistant. They perform all the inspections as prescribed in 0020 and do first and second echelon repair on the whole aircraft and engines. The crew chief calls upon the line chief

when he needs shop men for some specialized job, such as a plane damaged by flak. Or the crew chief will come to the line chief when he has some trouble with the plane that he cannot solve, such as some form of engine trouble. The line chief acts as a consultant, just as one doctor will call in another doctor to talk over a case. When a decision is reached the men are aided by the crew chief in the heavy tasks.

One of the more difficult things to impress upon crew chiefs is that it isn't necessary to wait the full 50 to 100 hours to pull an inspection. They must have proven to them that they are not cheating themselves when they do a running inspection during the last ten hours or so before it is actually due. In this manner, work is staggered and the plane is never out of commission. For example, if a ship is not going to be flown on a particular afternoon and forty hours are up, it is a good time to pull the tires instead of waiting for the final ten hours. In that way a plane, barring accidents, will never be out of commission longer than three hours.

WE have found that it is important to have more than one inspector to a squadron. In fact, three is the ideal number—a chief inspector and two assistants. They can cover more planes, break the inspections up and specialize in different parts of the plane. In general, over-all inspections the chief inspector can take the fuselage and tail section; the second man, the left engine and nacelle including the left wing and the third, the right engine, nacelle and wing.

The inspectors are not there to criticize or spy upon the crew chief and his assistant. They are there to aid in every possible way, and that is clearly understood in their attitude and work. All men are pulling together to make the planes as perfect and as safe as possible.

The most important duty of these three men is what we call the spot check inspection. Each day, in addition to their other duties, they go through every plane of the squadron for a different purpose. This is an aid to the crew chief, for they invariably discover things wrong long before the regular inspection. Here is how the engineering department breaks down this spot check inspection: Monday, landing gears, struts and fittings; Tuesday, tail group; Wednesday, electrical system; Thursday, engine nacelles; Friday, control cables and surfaces; Saturday, plane interiors and Sunday, emergency equip-

ment. These inspections are run in addition to the complete monthly check made on all of the squadron's planes.

It is impressed upon every man from the highest to the lowest that his equipment is the main thing. We do not tolerate men abusing squadron equipment. Only new men ever fail to exercise proper care, since you quickly learn how valuable and scarce all items become, particularly when you want a tool and find it broken. As soon as any piece of equipment is damaged, we fix it immediately for it might be needed the next day. Little things like small battery work lamps are important. Ours are constantly recharged in the event that we have to work at night.

Perhaps the most satisfactory thing about working far away from the comfort and luxury of hangars and shops is the opportunity to improvise equipment and to invent combinations of gadgets out of salvaged material. We have several such inventions, which serve a definite need and we feel that someone else might be stuck and want to know how to fabricate something like them.

Our mobile sheet metal trailer is our pride and joy and, like everything else we've run up, it is made from salvaged equipment. It contains a concrete Briggs and Stratton three hp engine which is hooked into a 110-volt generator taken from a cletrac. This provides electric power for running lights at night, drills, soldering irons and the like. It has an air compressor salvaged from a cletrac which is incorporated with two high pressure oxygen tanks for air supply tanks. The unit is driven by a five hp Continental putt-putt. It has an air regulator for riveting which runs an air hammer and air screwdriver. It can pump a maximum of 1,600 pounds of air pressure. To lower the pressure and maintain a steady flow under 75 pounds, a surge chamber was developed out of an old fire extinguisher.

ALL of the equipment is mounted on a 500-pound jeep trailer with extra spring leads. We have found that jeep trailers are the best, for they are the lightest and smallest. We have no use for large trailers. An important feature about all our equipment is that it must stand low to pass under the wings of the plane. With this trailer we can employ a large number of men on one plane and, at the same time, do sheet metal work, pump up the tires, clean the engines and pump up an accumulator. This was developed with the aid of Sergeants Troy, Berger and Boachek. As a result of a tragic lesson, we fabricated six droppable bomb bay baggage racks from salvage material. One of our planes was in transit with flying crews and ground personnel and their baggage. One of the motors cut out. The weight was too great. They couldn't throw out the baggage fast enough. As a result the plane went down.

Since that time, we have been using this baggage rack for transporting air crews with their baggage from one station to another in the South Pacific area. Now, in the event of an emergency when an engine fails and the pilot has trouble maintaining flight, he can drop the baggage rack just as he salvos his bombs to lighten the plane and maintain flight on one engine. The rack holds 2,200 pounds although 3,200 pounds has been carried.

Our dream project—to date we haven't been able to get either the parts or the time—is a mobile flat trailer large enough to carry three jacks. The flat part of the trailer would be eighteen inches off the ground so it would be easy to tip the jacks off. It would be about twenty feet long by five feet wide, similar to our 2,000-pound bomb trailer.

Each airplane, we have found, has its own peculiarities and develops other ones in the various theatres of operations. Here are the quirks we especially watch for in the B-25:

(1) Be certain that the individual exhaust stacks are secure on the exhaust cylinder flange. Keep close watch around the cowling for excess oil thrown from exhaust stacks.

(2) Check the rocker arm to see if the bearing is freezing. If it is tight and caught soon enough, it will prevent the necessity of pulling a cylinder because of a blown valve.

(3) Care should be taken by the crew chiefs when they put in hydraulic fluid to be certain it contains no foreign matter. As the plane gets old such matter will damage precision parts, like the brake valves. Use the gauge which is provided for measuring pressure on each wheel. Be certain the pressure is correct for the TO of the planes.

(4) Trim tabs and bearing attaching bolts. They'll come loose if they're not constantly inspected.

(5) Keep the self-aligning bearing connecting rod bolts as tight as possible.



Tech. Sgt. Clarence Lavender put a boom and hoist on a standard dolly; now mechanics are able to drive out to a plane, install or remove the prop in one operation.

At an advance base, with planes dispersed quick, mobile maintenance is necessary. This compressor, mounted on an old bomb trailer, keeps tires properly inflated.



(6) Proper tension of control tab cables is important at all times. Otherwise, the pilot constantly has to change the settings while in flight.

(7) After strafing missions, watch for metal fatigue in the sides of the nose next to the guns. The rivets may pop out.

(8) More care should be taken in setting the voltage regulators. One and a half volts over the specified 28.5 will burn up the batteries. That is too high a charge in this climate. The flight engineers or navigators should realize when they check voltage that it's more than just a question of charging the batteries. The voltage must be correct. We have a rule that no one touches the voltage boxes but the men from the electrical section.

Perhaps this is all old stuff. As I said before, we learned the hard way and we will undoubtedly learn a good deal more. Meanwhile, we expect to maintain our planes to the best of our ability and to shorten our time for an engine change in the field from less than our record of seventeen hours. ☆

TECHNIQUE

A Review of Technical Developments in the Army Air Forces



Ground and aerial views of the Kingcobra are seen in the accompanying photographs.

THE P-39 GROWS UP

The P-63 is the answer to the AAF's quest for a speedier and higher-flying edition of the Airacobra.

THE AAF has a new fighter that looks like an overgrown P-39. It is bigger, has a more powerful engine, can fight longer at higher altitudes and is faster than its Bell predecessor. Officially, the plane is designated the P-63. It is popularly called the "Kingcobra."

The P-63 is an all-metal, low-wing, land monoplane with a tricycle landing-gear and a single tail. Front, top, bottom and profile views are almost identical to those of the P-39.

The Kingcobra came into being in 1942 when the AAF decided it wanted a fighter plane that would outperform the Airacobra but would retain some of its features. Incorporated in the new plane's design are the P-39's cabin with automobile-type door, big air-intake scoop behind the pilot's seat and exhaust outlets on the side of the fuselage.

The Kingcobra also has a unique arrangement for horizontal stabilizer and elevators which are situated ahead of the triangular-shaped rudder.

With its great wing area and added power, the P-63 has a radius of turn shorter than that of any existing U. S. fighter. Its engineers claim it can turn with the Jap Zeros.

The fighter is powered by a single Allison 1500-horsepower, in-line engine with an improved supercharger. Its armament consists of one 37 mm cannon and four .50 caliber guns.

RADIO-NOISE ELIMINATION

A faint signal came over the radio and the pilot pressed the headphones tightly against his ears as he strained to hear the message amid the hissing, humming, buzzing, clicking and popping that jammed the air. Finally, he gave up, "damned" the radio and flew on past his last check-point.

But the radio was in perfect condition. Any number of times the radio is "damned" for being noisy. Yet, in most instances, the receiver itself is operating efficiently. The noise could be eliminated if ground repairmen were instructed to shield and filter the electric and engine ignition systems.

Noise, other than that created by loose electric connections, is known as "atmospheric static," which is most troublesome in the summer months, and "precipitation static," which is produced when a plane flies through rain, sleet, fog or snow. Application of static discharge rods is proving satisfactory for reduction of this type of radio interference. The noise that is most annoying and hardest to "hear through," however, is that produced by the plane's own electric equipment.

There is no mystery to radio noise. Sources can be located and the causes of the sporadic interference can be eliminated by a smart crew chief and radio specialist. The best way to tackle the problem is to analyze the noise and make test flights in which motors, inverters, amplidynes and generators are turned on and off. Perhaps one or two pieces of electric equipment are causing most of the interference. From the test flight, the noise may be identified as a product of the engine ignition system. Throttle changes may correlate with changes in volume or pitch of the clicking or buzzing noise in the headsets.

After such a test flight, the next step is to search for the exact part that is creating the noise. For this purpose, a probe antenna should be constructed. With this directional antenna, the radiation source of undesirable noise signals can be spotted. Shielding, filtering or separation of the radio circuits from

the electric circuits then are the remedial measures to be taken.

Each time a spark plug in the engine is fired, a radio signal radiates from all parts of the ignition system—harness, magnetos, ground wires, ignition switches—over the entire radio spectrum used for air communication (150 kc to +150 mc). In headphones, this signal sounds like the popping of a motor boat engine.

The practical solution of the problem lies in preventing radiation by confining all of the radio noise-producing energy to the ignition system circuits. This means that the entire system should be completely inclosed with a conducting shell of low resistance. When this is done, the inner surfaces of the shield provide a silent, return-current path for the spark.

Among the most common sources of ignition noise are the inspection covers of some magnetos, which have moisture-proof joints with standard gaskets. These gaskets are electric insulators which prevent the return flow of current and thus force radiation from the inspection cover. Such gaskets should be replaced with conducting gaskets, or the mating surfaces should be lapped with an abrasive such as a valve-grinding compound. The cover-fastening screws must be very tight because a loose screw can radiate an amazing amount of noise.

Noise also is created in motors, inverters, amplidynes and generators in the frequency range below 20 megacycles. These noise signals flow along all electric circuits and into the radio receiver. To prevent the flow of noise signals, radio noise filters are installed on motors and generators. Such a filter may be only a single capacitor for a small motor or it may be a combination of capacitors and inductors for larger motors and generators. To be effective, filters must be installed at the source, not several feet away.

Details for suppression of radio noise have been assembled and published in "Handbook for Elimination of Noise in Aircraft Radio," which is distributed by ASC and Aircraft Radio Laboratory, Wright Field. — **Lieut. Ray J. Colin, Jr., Equipment Laboratory, Materiel Command.**

TECH TALK . . .

By S/Sgt. Douglas J. Ingells,
AIR FORCE Staff Correspondent

Propellers are being coated with a protective, synthetic-rubber skin which helps to prevent icing. Electrically-heated wires, embedded in conductive synthetic-rubber, run along the propeller blades and break up ice on the blades . . . AAF propeller experts are studying a new, automatic, constant-speed propeller for light airplanes. A system of pulleys and belts, linking the propeller shaft with the shaft of a small governor, actuates change of pitch in the prop blades with variations in engine speed . . . A hollow, steel propeller-blade, with small openings to admit hot air drawn from the engine, is being tried out. The hot air enters through the shank of the blade and exhausts through an opening near the tip. The plan is based on a new thermo-anti-icing process. The propeller is designed so that the openings do not seriously affect its thrust . . . Sidewall fins, designed to start the wheels rotating in the air, are being tested on big airplane tires. By spinning the wheels at the ship's landing speed, engineers hope to eliminate drag and to prevent blowouts. Smaller, lighter, rubber engine-mounts are now in use in Flying Fortresses. The new-type mount saves approximately fifteen pounds and helps considerably to eliminate vibrations in the bombers. The result is more accurate bombing and gun-aiming and less strain on crew members.

PILOTS who fly the new jet-propelled fighter claim the plane has practically no vibration. Paradoxically, they complain about the ship's smoothness in flight. Because there is so little vibration, the instrument needles do not actuate properly and sometimes give inaccurate readings. As a result, a small, instrument-panel vibrator has been installed in the fighter . . . The B-19, world's largest landplane, has had its nacelles converted to house in-line, liquid-cooled engines in-

stead of the 2,000-horsepower Pratt & Whitneys which never gave the sky giant enough power for hot performance.

Sandwiched filters, based on the principle of Polaroid sunglasses, have been incorporated in bombsights, periscopes, goggles and gun-sights. The filters consist of a thin, dyed, plastic sheet sandwiched between clear glass . . . A tougher, plastic, resin-based, packaging material called "V-film" is being considered for replacing plicofilm in the wrapping of aircraft engines for overseas shipment. The new material is more tear-resistant than plicofilm . . . Work inside aircraft in hot climates is being made more comfortable by a small, mobile ventilator. The two-wheeled unit contains a power blower which forces air through a collapsible canvas duct to the area which is to be ventilated. The entire apparatus weighs about 87 pounds and can easily be handled by one man . . . A small air pump which sustains constant suction in gyroscopically-operated instruments is being tested. Designed to improve instrument functioning at high altitudes, the unit consists of an engine-driven pump, a pressure safety-valve and a throttling and unloading valve. It offers protection against overloading of instruments.

Bomb release controls on the latest B-25s have been duplicated in the pilot's compartment. The pilot can release the bombs if the bombardier is disabled. Bomb bay door releases have been shifted from the navigator's position to the pilot's panel in the new B-25s . . . Reduction in the number of cockpit controls has been accomplished by interconnecting them. Throttle, propeller adjusters and mixture controls have been combined into a single lever. Speed-boost control is accomplished by a series of cams and linkages which mechanically synchronize all operations . . . The Formation Stick, a miniature control-column, now regulates the bigger bombers. The new control-box is about four inches square and has a small six-inch stick with a conventional fighter-grip. It operates the controls which run the automatic pilot. Simple wrist movements can direct the planes. ☆



A B-17 is seen releasing the Flying Dutchman at an altitude of 800 feet. Seconds later, three huge parachutes billowed open to support the newly-developed, motorized lifeboat in its descent to the water.



To save gasoline, the boat can be converted into a sailing sloop by use of its portable, 20-foot mast and 145 square feet of mainsail and jib. Stowed food and equipment are ample for a 1500-mile voyage.

In carrying position, the Flying Dutchman hugs the fuselage of the plane. The fit is so snug and the boat's lines, with prow forward, are so smooth that the burden reduces a B-17's speed only eight mph.



THE FLYING DUTCHMAN

At first it seemed as if the bottom had dropped out of the Flying Fortress as it roared by low overhead. But a second later as three huge parachutes billowed open, the "bottom," which they supported, could easily be identified as a life boat. Down it floated until, prow first, it struck the waters of the Gulf of Mexico. A small group of men in a rubber life raft drifted downwind to the boat, climbed aboard, started the motor and headed for the dock. The AAF was testing its "Flying Dutchman."

That was in April when trials were being run with the newly-developed, portable-by-air, all-plywood, power-driven lifeboat which is dropped from planes to personnel stranded at sea. Today it is in mass production and doubtlessly will play an important role in air-sea rescue work. The boat provides shelter and carries food and clothing and enough gasoline and sail to permit a voyage of 1500 miles in the roughest weather on any ocean in the world.

Designed late last fall by the sea rescue unit of the Materiel Command's equipment laboratory, the new airborne lifeboat, now an AAA priority project, will be used to provide a navigable craft for:

- Floating survivors of ship sinkings or ditched planes when mountainous waves prohibit seaplanes from landing and effecting on-the-spot rescue or when there are too many survivors to be picked up by heavily-laden, patrolling aircraft.
- Survivors stranded on isolated islands, which are inaccessible to planes because of dangerous coral-reef approaches and jungles.

At present the Flying Dutchman can be borne only by B-17s, but installations are being devised for other types of heavy planes such as the B-29, C-46 and C-54, all of which are so constructed as to provide ample ground clearance when the boat is in carrying position.

Light but strong cables, which are attached to conventional bomb shackles, hold the boat snugly against the fuselage of the Fortress. Only about thirty minutes are required for hooking the boat to an operational B-17. The plane's bomb bay doors are removed and the standard bomb-hoist lifts the boat into place. The fit is so perfect and the lines of the boat, with prow forward, are so smooth that the extra burden reduces the bomber's speed by only eight mph. The installation causes no interference with the operation of the plane's armament.

The boat is released by the mechanical bomb-salvo, operated either from the bombardier's or pilot's compartment. A cluster of static-lined-operated parachutes is used to lower the craft to the water.

Constructed of plywood, the 27-foot boat weighs a ton

empty and can carry three times that weight in men and equipment. It is powered by twin, five-horsepower, air-cooled engines, each geared to a bronze, two-bladed propeller of seven-inch diameter.

Top speed of the boat is eight mph and it has a fuel capacity sufficient for a 400-mile voyage. Included in the equipment is a 20-foot, solid-wood mast which, when fitted with 145 square feet of mainsail and jib, converts the craft into a sailing sloop for the purpose of conserving gasoline.

In addition to furnishing power, the engines are used to operate two salt water stills and their hot cylinder-heads serve as stoves for heating canned food and coffee and for frying fish and birds which survivors may catch.

The stills, which are situated adjacent to the engines so they can utilize the exhaust heat, produce two gallons of distilled fresh water for every gallon of fuel burned. Exhaust heat also helps keep the stern cabin at a warm temperature when cold weather is encountered.

DESIGNED with a center board and rudder, the boat is divided into three sections—fore and aft chambers, which also serve as cabins, and an open-cockpit in the center. The chambers contain cylinders filled with carbon dioxide, which provides the craft with buoyancy and prevents it from capsizing. Each of the chambers can shelter four men from inclement weather and the blistering rays of the sun.

Every essential for treatment of the wounded and ill and for the sustenance, safety and comfort of all survivors during a long voyage is found stored in the Flying Dutchman. Standard equipment includes blood plasma, medical kits, canned foods, fishing tackle, blankets, air mattresses, rain-repellent pants and parka jackets, underwear, fatigue hats, sox, a Gibson Girl radio, signalling devices, cigarettes and chewing gum.

On one test, seven men lived in one of the boats for six days, sailing 600 miles across the Gulf of Mexico. They heated the stored food and coffee, fished (with no luck) and weathered a 30-foot sea.

Development of the Flying Dutchman required plenty of patience. Trials were begun with the dropping of a dummy boat in which engines and equipment had not been installed. This operation proved dangerous, for the boat, upon release, dropped but a few inches before it was caught in the terrific force of the windstream and hurled back against the plane's fuselage, which was damaged by the impact. Now, a catapult device pitches the boat away from the plane.

Then the first boat to be dropped with engines and full equipment aboard tore away from its parachutes and smashed to bits. A new harness installation and other changes prevented a recurrence of that mishap.

As a result of the tests, a standard procedure for releasing the boat has been adopted. Over the stranded personnel, the plane is flown into the wind at an altitude of 800 feet—the lowest height from which the chutes will have ample time to open—and at a speed of 120 mph, achieved with one-third flaps. Under these conditions, the boat will alight downwind of the survivors so they can drift toward it.

After leaving the plane, the rescue boat is supported during its drop to the water by three 48-foot rayon parachutes. A sling with two cables, one attached to the bow and the other to the stern, serves as a harness for parachute attachment.

The craft strikes the water, bow-first, at an impact speed of 25 feet per second and at an angle of 45 degrees. Immediately, a smoke pot, set off by a static line, burns so that stranded persons can spot the boat even though waves may hide it.

At the same time, two rockets with 150-yard buoyant lines are fired outward from each side of the boat. The rockets are released electrically by means of a salt-water immersion switch. By use of the lines, the survivors are able to pull themselves to the boat if the sea is too rough for paddling.

Once aboard, the rescued men can travel for 1500 miles with all the comforts of a planned cruise.

WHAT'S NEW...

CARGO TIE-DOWN KITS — Three new types of cargo tie-down kits (R-1, R-2 and R-3) have been standardized for use in cargo planes to provide a quick systematic method of on and off loading of heavy equipment. They have been used extensively by the Air Transport Command in recent months. Light trucks, machines, power plants and the like, may be firmly secured in all types of cargo planes. Rope hooks designed to eliminate laborious knot tying and wasteful cutting are included in the equipment. Rope tighteners take up any slack which would allow cargo to shift and, wherever possible, rods, beams, locks and jacks are used in place of rope to eliminate slack. Type R-1 Cargo Tie-Down Kit (Spec. 40649) is designed for use in C-60 and C-64 aircraft. Type R-2 Kit (Spec. 40650) is designed for C-47, C-53, C-53A, C-62 and C-76 aircraft. Type R-3 Kit (Spec. 40651) is used in C-46 and C-87 planes.

SAIL ON IMPROVED RAFT — The AAF's latest Type C-2, one-man life raft weighs only eighteen pounds, complete with sail and spray shield, and attaches to the life vest. The spray shield attached to the top of the raft, protects the occupant from sun exposure and drenching by waves and rains. Made of a light, waterproof material it is snapped or strapped around the occupant when he is in a sitting position. Bright yellow on one side to attract attention, the shield is blue on the other for camouflage protection. Made of a tough, light, red fabric triangular in shape, the sail is fitted to a five-foot high aluminum mast which telescopes to fit in the pack. The life raft pack is constructed in two sections. The outer section of the pack is fastened to the parachute harness, while the inner section with raft and accessories is attached to the life vest. When the prepare-to-ditch signal is given, the pack is snapped to the parachute harness. The inner section remains attached to the life vest when the harness is released, thus eliminating the danger of the raft drifting out of reach in the water. Basis of issue for Type C-2 one-man life raft will be one for each crew member on bombardment type planes.

RAIN REPELLER — A newly developed rain repeller kit makes glass surfaces shed water like a duck. The water repellent mixture has been developed for use on any flat or cylindrical glass or plastic surface not protected by windshield wipers. Twenty bottles of liquid contain enough rain repeller for ten applications on an average windshield. The film formed by the rain repellent mixture causes an increase in the surface tension of rain drops. Instead of sticking to the glass and distorting vision, drops hit the surface and are immediately blown off by the air stream. The film will not affect visibility in dry or wet weather, and ingredients contained in repeller liquid will not harm plastic windshields.

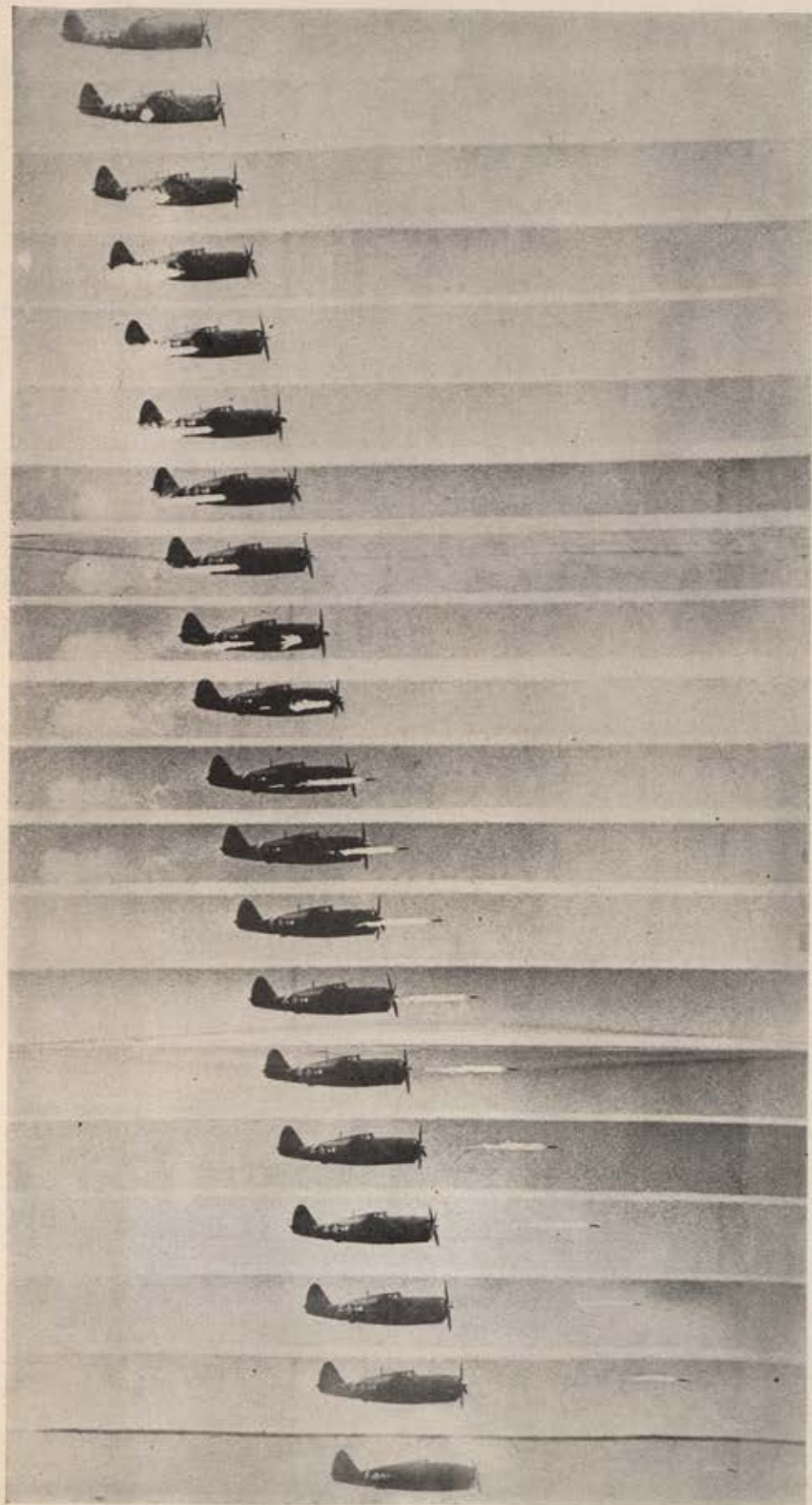
ELECTRICALLY HEATED FLYING SUIT is replacing the F-1 (original blue one-piece electric suit which was wired in series) and the F-2 (the elastique jacket and trousers with the buttoned-in electric liner). As distinguished from previous types, the F-3 is merely an auxiliary garment to carry the heating wires. Without any current in the wires, the suit has little insulative value. Wired in parallel, each shoe, each glove, the jacket and trousers can be heated independently and should any one unit fail, the others will operate. The F-3 is part of a complete outfit—long woolen underwear, GI shirt and trousers, electric suit and intermediate (alpaca) suit. Cold room tests indicate the outfit will keep a man comfortable at minus 40° Fahrenheit.

ENGINE HOIST — THE TYPE A-7 PORTABLE ENGINE HOIST has been standardized and will replace type A-2 hoists now in use for general engine changes. Now designed to handle all types and sizes of aircraft engines, the A-7 hoist is portable by air, weighing about 1,000 pounds. It is easily knocked down for transport. Mounted on three wheels, the hoist may be towed behind a jeep at slow speeds. The hand winch supplied with this unit has a capacity of 4,500 pounds and can be operated without difficulty by one man. The hoist is designed with a 17-foot 6-inch ground clearance and a 6-foot 6-inch reach.

Prepared in collaboration with the
Engineering Division, Materiel Command

OUR ROCKET-SLINGING FIGHTERS

By Lieut. Col. H. L. Donicht, ARMAMENT LABORATORY, MATERIEL COMMAND



AN Oriental weapon, centuries old, is back in the Orient again helping to defend the Chinese who first invented it. The rocket—which China's warriors used against the Tartars in 1232—fitted to American fighter planes has given air power a new and deadlier striking force. Literally, it puts wings on our biggest divisional artillery guns and gives them the mobility of our fastest fighter planes.

Rocket-slinging Mustangs, Warhawks and Thunderbolts in the CBI and South Pacific theatres already have struck decisive blows at Jap landing barges, locomotives, ammunition trains, island fortresses, warehouses and other ground targets.

In developing the rocket weapon, skepticism and difficult engineering problems had to be overcome. One of the chief problems was to get the rocket gun out of the Buck Rogers' world and into practical installation for aircraft. In two years of stepped-up research, AAF armament experts have tried to surpass the Germans, who have been wrestling with the rocket gun for more than ten years.

On July 6, 1942, flying in a Curtiss P-40 in the skies over the big Aberdeen Proving Ground, the author fired the first airborne American-designed rocket gun. That was the beginning and at that time the plan was to develop high-explosive self-propelled projectiles for air-to-air fighting. War changed all of that and today our rocket-equipped fighters use their "torch guns" exclusively against ground targets. Here's why:

THE British urgently needed a weapon to break up the hordes of Junkers, Dorniers and Focke-Wulf bombers when they came over in order that RAF Spits and Hurricanes could effectively challenge them. That was in the early stages of the war. Now that our Fords, Liberators and British heavies have "dumped the sky on Berlin," the Germans have been forced to find a new weapon. The Nazis turned to their ground rockets which they had been using in their field guns and applied them to aircraft. The result was a cumbersome, heavy rocket gun installation beneath the wings of their small fighters, yet highly effective as a surprise weapon.

The price of defeating Nazi rocket tactics required the development and diversion of long range fighter aircraft. It also led to more intense interest in rocket usage in our own combat aircraft.

A high-speed camera catches a P-47's rocket gun in action during flight. The prop was feathered to permit making the photo-series.

A Development Story of the AAF's 'Heavy Artillery'

And since the enemy at this stage of the war isn't providing us with big air targets, due to his lack of bombers, our rocket guns have been principally designed for air-to-ground work.

Initial installations were made on a production P-40. A single tube of steel was hung under each wing. This tube had fairly thick sidewalls since we didn't trust the rocket forces about which we knew so little. One thing we had learned, however, was to make the tube long enough so that it took the rocket blast away from the surfaces of the wing. A long tube, throwing the fast moving gases out into the airstream, provided a universal answer for installation on aircraft of fast burning rockets.

The heart of the rocket gun is its projectile. Unlike a big gun whose chamber holds the powder charge which hurls the shell through space, the rocket carries its own power along with it.

The projectile we are using today was developed by the Ordnance Department with the cooperation of the NDRC and AAF personnel. Made by Army Ordnance, it is called the "four and a half." The projectile is four and a half inches in diameter, approximately a yard long and is comparable in size to a 105 mm shell. The shell has three main sections—the fuze, head and the motor.

The shell's head carries its destructive force. Approximately one-third of the entire projectile in length contains a large charge of HE. The HE charge is set off by the fuze upon impact of the shell. It may also be timed to explode at a preset range from the aircraft, a method the Germans are using extensively. They fire their rockets with time fuzes and the pro-

jectiles explode in the air, raining fragments on our bomber formations.

Directly behind the powder head of the rocket projectile is the motor shell or chamber. The "motor" is rocket propulsion—its driving force set up by jet gas pressures propels the projectile through the air to the target. The motor is filled with powder propellant which, when ignited, shoots gases at a high velocity out of the tapered end of the motor case, which is about one and a half inches in diameter, causing jet propellant forces which thrust the projectile forward. The small end of the projectile casing takes the form of a Laval Nozzle, a type which has been used in supersonic wind tunnels to create highspeed airflows. It has the same effect in compressing the jet gases.

ENCIRCLING the "nozzle" at the tail end of the projectile are six fins, each about four inches long and an inch wide, hinged in such a manner that they fold into the rocket tube. Once the projectile is fired the fins fan out to help guide and stabilize it in flight. The rocket is ignited electrically by the pilot who presses a button or trigger on the stick.

The combined weight of the two three-tube clusters carried by our fighter planes and their projectiles is about 450 pounds, as compared with a ground-type 105 mm howitzer and six rounds which weigh approximately two tons—or ten times as much.

A small fire control box in the cockpit enables the pilot to fire the rockets individually or "in-train," the six projectiles leaving the tubes at one-tenth of a second intervals. Potentially, a single fighter pilot flying a Thunderbolt with its

eight .50 caliber wing guns and six rocket tubes in a single strike has the firepower of six armored forces tank-busters.

In addition to its detonating effect, the rocket spreads gaseous flame and hot metallic ashes which set fire to anything inflammable, making it particularly effective against gasoline storage tanks, ammunition dumps and warehouses.

The present rocket guns are mounted so that their sightline is the same as that for the fifties in the wings, thus permitting use of a single gunsight for firing both rockets and machine guns. Tubes now in use are made of paper plastic with side-wall thickness of about one-fourth of an inch and they are one-third as heavy as the steel tubes previously used. The tube clusters can be jettisoned from the wing either before or after firing, giving the pilot maximum performance. The jettisoning of the tubes and the resulting waste of about 400 pounds of steel on each single-plane mission led to the development of paper plastic tubes, as did the consideration for minimum reduction of climb. When in flight, with tubes and rockets ready for firing, the airplane loses little of its performance.

Rocket installations are so positioned on the wing of the fighters that droppable fuel tanks or bombs also may be carried.

We are improving present installations, and it may be that in future we will have rocket guns to hurl projectiles such as those fired from battleships.

Although it is granted that the fine firing mechanisms and heavy tubes of our conventional cannon make them more accurate, the rocket gun, because it is light and can be applied to fighter aircraft, is the AAF's "heavy" artillery. ☆

General appearance of the jettisonable rocket-tube installation on the P-47 and of the projectile itself is seen in these photos made during tests at Wright Field. The unit consists of three guns, each of which

carries one rocket. The flexible fins of the projectile fold into the tubes which are loaded from the rear. The rockets shown are dummies used for experimental purposes only and they are not fuzed.



BEATING THE ODDS

A colonel, who has been a passenger on 84 missions, checks the human equation and keeps his number down.



THERE'S a colonel now attached to one of the 9th Air Force's B-26 outfits who probably has ridden as supercargo on more combat missions than anyone else alive. He is officially credited with 84 trips over enemy territory—which is pretty good for a ground officer, non-rated and not on flying pay—and he wears the Silver Star, the Distinguished Flying Cross with one oak leaf cluster and the Air Medal with four clusters.

He won't let us use his name and his job is secret, but the boys call him "Mike" and the job doesn't matter to our story, which is about how he's managed to fly combat in every theatre of war except the Aleutians without ever getting hurt and about the method of survival he relies on rather than his luck, which he figures must have run out long ago.

"This business about your being able to do nothing about it when your number's up may be all right for most people," Colonel Mike says, "but I've got to figure another way. Riding as a passenger, I have to worry about whether the pilot's number is up. So I've developed several theories on how to tell when a particular crew is probably in for it. So far, I've been right."

When he arrives on a strange field, the colonel tries to arrange not to fly for at least a day or two. In the meantime, he gets to know the pilots and makes a mental list of people with whom he doesn't think it wise to ride. Highest on the list he puts crews, any member of which can't answer quickly and without deliberation these questions:

"Who's your co-pilot?"

"Who's your engineer?"

"Who's your bombardier?"

"Who's your tail gunner?"

"Who's your turret gunner?"

The colonel figures that any member of a crew, which has been kept intact, can't be very good if he can't rattle-off the names of his teammates. Mike also feels that any crew, which has been changed or broken-up so frequently that its members don't know each other, isn't long for this world.

Sometimes, the colonel's queries draw blanks from every crew of an entire group. In that case, he leaves the station and waits for the CO to be relieved. This change invariably takes place, he says, as soon as Command gets a look at the group's loss-rate. When a new CO—one who insists upon crew integrity—arrives Mike goes back and rides happily.

WHEN Mike, after arriving at a field, finds three or four crews which seem composed of bright boys, he sets out to find the safest pilot among the eligibles. He reaches a preliminary decision by obtaining, mostly through observation, the answers to a set of questions which he uses as a check list:

- Is the pilot alert and attentive during briefing or is he busy playing hero, demonstrating nonchalance and yawning loudly to show what a sleepless Casanova he is?

- Does he take a good healthy interest in the various safety gadgets and in emergency technique?

- If Mike asks him to run through ditching procedure, does the pilot do so with intelligence and understanding or is he one of the "things-like-that-can't-happen-to-me" boys?

- Does he check to see that there are extra chutes, Mae Wests, rafts, jungle kits and flak vests aboard for his passenger? (It's not that Mike minds getting those things together for himself but he likes a pilot who displays a feeling of responsibility for everybody aboard his ship.)

- On the line before take-off does the pilot lie flat on his tail and dream about life in Winnetka, Ill., or does he stay on his feet and do something about insuring that he'll get back alive to the "garden spot of Chicago?"

- Does he look into the bomb bay to see if everything's ship-shape?

- Does he insist that the plane is thoroughly pre-flighted?

- Does he run through an intercom test before take-off, when there's still time to correct faulty equipment?

- Does he talk things over with his gunners and interest himself in their equipment or is he one of the walking dead who figure enlisted men's business is enlisted men's business?

That's about as far as the colonel is able to go in his quest for a safe pilot without actually flying with a guy.

Once in the air, Mike keeps a sharp eye on the pilot in order to verify or correct his earlier appraisal of the man.

Observing the pilot's flying skill, the colonel pays particular attention to the man's ability to relax at the controls, his familiarity with the type of aircraft and the particular ship he's operating, his ease and sureness in handling the plane, his knowledge of and attention to the instrument panel, his deftness in setting the trim tabs and his concern with fuel conservation.

Next he determines whether the pilot is leader of his crew or just an aerial chauffeur. He likes a pilot who, by checking all posts frequently, knows at all times where each crew member is working and what operation each is performing.

If the pilot proves to be in complete command of his plane and crew and of every situation which presents itself, the colonel then feels he has a man with whom he can fly with confidence that the percentage for survival is in his favor.

BUT if he discovers that his original estimate was erroneous and that the pilot does not come up to his standards, about all Mike usually can do is ride out the mission, meanwhile making a mental note not to choose that pilot again if he is required to accompany the same group on another mission.

On one occasion, however, the colonel didn't hesitate to cause an abortive flight when he detected what in his opinion was a serious shortcoming in the pilot. A few minutes after taking off from China in a B-25, Mike happened to inquire what the colors of the day were.

"Colors?" asked the pilot in surprise. "Why, everybody around here knows what a B-25 looks like."

Astounded, Mike shouted and roared the kid into turning back. Not being a command pilot, the colonel isn't sure he was within his rights. He has an idea he did a wise thing, though, because the color-of-the-day-blind kid was reported missing in action three days later.

"It's not that I'm queer for identification signals," Mike explains. "It's just that I like to ride with people who take their flying seriously and aren't too lazy to try to stay alive."

The colonel realizes, of course, that even the best pilot and crew may run into trouble.

"Things can happen," he says. "Things always can happen. Flak can play a lot of strange tricks. The best evasive action in the world may steer you right into it. Or weather—the air itself—can gum up well-laid plans. But my theory is that a good crew has a far better chance of emerging safely from an unavoidable jam than a poor crew has under the same circumstances."

By the time this is printed, Mike may very well be missing or dead. He says so himself. That's why he wants to remain anonymous.

"If they know my name and then hear sometime that I didn't come back," he reasons, "they'll figure what I've told you is just a lot of bull. They'll forget 400-and-some-odd combat hours without a scratch. But if they don't know my identity, the effect will not be lost and they may learn something. The more they learn, the longer they'll live, and the longer they live, the more they'll learn." ☆

Snow, Sand and Sarongs

JUST a reminder: it is now winter in Australia and other points Down Under.

You've seen pictures of engines in water-tight pliofilm jackets for shipment. The same principle of waterproof packaging is being applied to other aircraft components as well. The technique is to include some water-absorbing agent, such as silica gel, with the waterproof cover, then brace the component firmly in a sturdy outer package.

In the fight to save equipment from the ravages of humidity, fungus and insects, AAF and QM investigators are testing textiles and other stuffs by the "soil burial" method. The material is buried in carefully prepared soil—a mixture of loam, vegetation and manure—which is a happy growing ground for destructive organisms. Fixed temperatures and humidities are maintained. After a time, the material is dug up and examined. The effectiveness of various protective coatings is tested in this way.

It's especially bad practice to lay any object or put pressure on plexiglas in hot weather. Dents in gun turrets may cause distortion and fatal interference with vision, and if an astrodome is the least bit out of round, the plane may not come back. A deviation of one percent in the aerial navigator's sextant sights will cause an error of seventy miles on the earth's surface.

There is a definite question whether any racial distinction exists in ability to adjust to cold weather. For example, Chinese and Mongolians stand great cold in winters on the Gobi, and Admiral Peary's best traveling companion, who reached the pole with him, was Matthew Henson, a Negro.

Before the Japs came, anthropologists found tribes on some Pacific islands who had forgotten what war was. Incidentally, in several of the various Eskimo languages there is no word for war.

Cockpit covers are sometimes "must-nots" rather than "musts." In the wet tropics, tight covers prevent movement of air and the condensing moisture plays tricks with instruments. The same principle applies to general supplies. *Don't* tuck material under a cozy, tight tarpaulin. Better, put the cover over a ridge-pole, leaving air space above the supplies. In addition, stake out the edge of the tarpaulin so that it leaves a free space a couple of feet above the ground for ventilation. Make sure the supplies themselves are off the ground.

Remember in an emergency that cotton from your first aid kit makes good tinder. You can produce sparks with a knife and the flint imbedded in the bottom of your match box (it's GI). ☆

Prepared by the Arctic, Desert and Tropic Information Center

UNSATISFACTORY REPORT

(See AAF Reg. 15-84 for information on Proper Use of this Form)

LEAVE BLANK		
A. S. C. SERIAL No.	REFER TO	CLASS

TO BE FILLED IN BY STATION	
STATION SERIAL No.	DATE SUBMITTED

STATION	ORGANIZATION
SUBJECT OF REPORT	Priority Class—Name
RECEIPT—AAF & AAF Serial No.	UNIT OR ADDRESS—Type, Model and Serial No.
DATE	REPORT MADE BY

THOSE TROUBLE-SHOOTING URs

Here's what happens to Unsatisfactory Reports.

MOST disliked report in the AAF is the Unsatisfactory Report (UR), for it spells TROUBLE in capital letters. Yet, it is the one report that is a sure cure for trouble—if properly handled.

A complete UR, submitted on the proper form (red-bordered AAF Form 54, revised 2-18-43) the same day an unsatisfactory condition is discovered may save lives and equipment. It may lead to a design change, a modification or issuance of a new Tech Order.

Landing gears are reinforced, tail assemblies are redesigned and special instruction sheets are issued because experience proving the need for changes is passed along to the right persons in the AAF via URs.

Every UR received is incorporated in a semi-monthly UR Digest, which lists the type of equipment that malfunctioned or failed, the number of such failures reported by the entire AAF, the cause, if known, and recommended action.

The Digest (TO No. 00-65), distributed on the basis of individual needs, advises all AAF, Navy and British organizations of the nature of faults discovered in our planes and equipment. In addition to outlining necessary corrective action, the publication describes symptoms which warn of trouble, thus permitting dangerous conditions to be corrected before they cause failures.

More than 12,000 Unsatisfactory Reports are received by the Air Service Command's maintenance division at Patterson Field, Ohio, every month. Many of them result in extensive research and tests over a period of months.

Some URs cover conditions which are not of extreme seriousness. The priority for handling such reports is determined by the number received on particular malfunctions. The more widespread the occurrence of the same type of failure, the more quickly will action be taken by Air Service Command and Materiel Command engineers. So that all difficulties may be dealt with in order of their importance,

it is essential that they be reported promptly.

If discovery is made of a serious malfunction or failure that threatens lives, planes or equipment, a preliminary report should be rushed by telephone, teletype or radio to Headquarters, ASC, Maintenance Division. Speed is vital.

When the brake pedal of a P-47 fell forward and jammed in the foot-trough during a landing, the pilot lost control of the plane and it veered from the runway into a ditch. A UR filed promptly by the 5th Air Force, listed a "missing washer" as the likely cause of the mishap.

As a result of investigation which indicated wholesale omission of the washer when the planes were produced, headquarters, ASC, immediately ordered inspection of the 2,800 other Thunderbolts of the same model and corrective action where necessary.

A UR from Walterboro Field, S. C., revealed the washer had been omitted also from another type of P-47. Consequently, the "bug" was eliminated from 300 planes of that series.

Thus, prompt handling of two URs probably saved many lives and planes. The total value of the aircraft affected by the assembly line error was \$233,000,000.

Fundamentally, the UR is nothing more than a written diagnosis of ailments and malfunctions of airplanes and equipment. It may be prepared by any individual assigned or attached to the AAF.

The Air Service Command immediately can prescribe remedies for more than 80 percent of the complaints by drawing upon the reservoir of information it has gathered from aircraft manufacturers, technical field representatives, tactical squadrons and service depots all over the world.

The other 20 percent of the reports—those disclosing structural or material weaknesses, defective assemblies or excessive wear—are referred promptly to the engineering and production divisions of the Materiel Command for intensive investigation. This action sometimes leads

to design modification, material substitution, closer supervision of inspection or rearrangement of accessory equipment.

In one sense, our combat airmen today are redesigning the AAF's planes and equipment through the system of reporting unsatisfactory operation or performance. Often the remedial measures adopted upon recommendations from the field are standardized in later Tech Orders.

FOR example, on March 16, 1944, a UR was made out by an A-20 squadron overseas. The complaint was that the pilot's emergency canopy release on the A-20C was difficult to reach, particularly when the top armor-plate section of the pilot's seat was swung into erect position.

A suggested remedy, worked out on one plane, was described with photos in a UR. As a result, Materiel Command engineers on May 10 recommended to the Air Service Command that other A-20 squadrons be authorized to follow the same procedure, which calls for lengthening the cable and rerouting it, to prevent chafing, through fairleads to a pulley near the forward edge of the canopy from which the release handle is suspended. A spring clip holds the handle in place.

Here was an instance of redesigning by tactical crew members. And the job was first-class, good enough to be recommended to other squadrons.

A 10th Air Force B-24 squadron suggested provision of a mechanical brake to hold the Liberator's top turret in azimuth, because prolonged attacks of seventy minutes or more required the turret to be held into the wind and resulted in overheating and burning-out the amplydine. The armament laboratory at Wright Field developed a one-pound, hand-operated brake and recommended preparation of kits for installation in planes encountering similar enemy attacks of long duration. This was another example of development of new equipment upon the suggestion of a tactical unit.

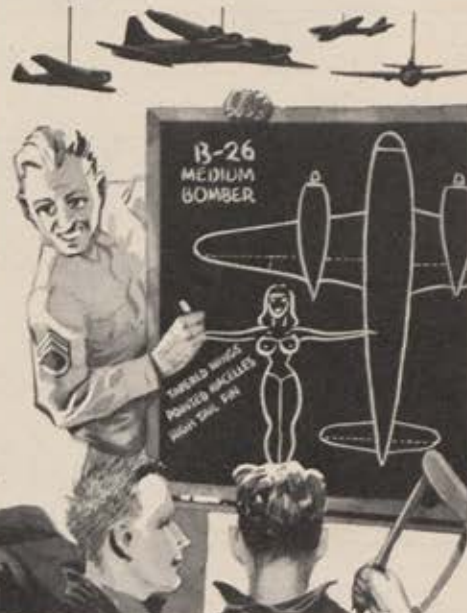
Because more than (Continued on Page 41)

It takes awhile for new customers of the orthopedic ward to become sold on the calisthenics program as presented by PT instructor Sergeant Rochester. One of the sergeant's best salesmen is Tail Gunner Gordon who has sampled the exercises long enough to reap the dividends of speedy physical improvement.

AAF CONVALESCENT TRAINING PROGRAM



Training classes at the regional hospital may be short on formality but they are long on ingenuity and participation. Sometimes the patients themselves play the professor's role. Sergeant Ryan was a big-league magazine illustrator in civilian life and here he puts a little zing into the aircraft recognition course.



Instead of stringing beads and counting the cracks in the ceiling, ambulatory tenants put their time to functional use. Three dayrooms and a library have been completely furnished with the products of the wood-working shop.



At the farm adjoining the Convalescent Center, returned airmen have an opportunity to renew acquaintances with things of the soil. To some members, this is a brand new type of mission. Co-pilot Davis is now being briefed for the "milk run" while bombardier Brown picks up some real eggs to drop off at the officers' mess.



To expedite further the mending of tired minds and bodies, an occasional co-ed picnic is arranged whereby the sun and sea may help to spark up a jaded appetite. The Red Cross and local feminine talent co-operate to the fullest extent.



NOTES ON

WOMEN'S ACTIVITIES IN THE AAF



BIDDING THE BOYS GOODBYE IN COMFORT

There is no time quite so precious to an Army man as those last few brief days in his staging area when, for the last time until he returns from combat, he has a chance to be with his wife, mother or sweetheart. Typical of these many staging areas throughout the country is that of the 21st Bombardment Wing at Topeka, Kan., where highly trained bombardment crews come for a period of not more than seven days for final processing before taking off for overseas duty.

Wives, mothers and sweethearts come there to bid their men farewell but arrive to find "no room at the inn." The 21st Bombardment Wing stations, like scores of others throughout the country, are located in farming communities, which ordinarily have little demand for transient housing, and proper hotel accommodations are purely wishful thinking.

"You cannot imagine what it's like," said one woman among the first to arrive dusty and tired at such a station in its early days, "to get here, hoping that these last few days will be ideal ones and then find you have no place to stay or no way of finding out what's available, no place to sit out the hours while you're waiting

to see your husband, no place to leave the baby you've brought to see his daddy, no one even to give you any information."

Although charged with the major task of meeting commitments for his crews in all theatres of war, Brig. Gen. Albert F. Hegenberger did not forget the truism that in war, morale conditions make up three-quarters of the game. And high morale, he realized, is not built by improperly housed wives, mothers and

sweethearts, especially when it is only a matter of days until their men "shove off," some never to return.

General Hegenberger directed that the officers' wives club launch a project known as the Combat Crew Wives' and Mothers' Club and that it sponsor such facilities as a reception and information desk, lounge room, nursery, rest rooms and Red Cross program. Later the group became part of the women's volunteer section of the Personal Affairs Division.

They took over a farmhouse adjacent to the officers' mess on the Topeka field and renovated it for use as headquarters for women visitors. Volunteers man the information desk every day, welcome newcomers, receive messages and help with transportation and housing problems.

After a tiresome trip the visitors can bathe and rest in one of several bedrooms in the club house, read and relax in attractive lounges and place their small children in a nursery equipped with cribs. In their spare time they join the wing and base wives to knit and sew for the Red Cross.

HIS KINGDOM FOR A 'UKE'

It may be years since a lot of GIs gave up trying to be another Heifetz, Larry Adler or Benny Goodman. But now when they are stationed at some bleak outpost in the North Atlantic or on a lonely

Pacific atoll, they would trade this month's pay check for that clarinet Mom finally gave away because nobody used it any more.

Chances are, these men can't get musical instruments where they are now, the folks back home can't send them because generally they can't even find one to buy these days. But lying unused and forgotten in the country's attics and storerooms are literally hundreds of thousands of discarded harmonicas, accordions, guitars, violins, "ukes," trombones and the like.

An organization known as Music for the Services collects these instruments from all parts of the country, repairs them if necessary and sends them, together with sheet music and books of instruction, to isolated posts all over the world. Very often they are delivered to our men by air, for occasionally there is some last-minute space available just large enough to tuck away a violin or a "sax" after the rest of the cargo has been put aboard planes heading overseas.

AAF women volunteers are active in the nation-wide drive to ferret out a bumper crop of instruments this summer. Mrs. Stuart Godfrey, wife of Brigadier General Godfrey, of the Air Engineers, founded Music for the Services, and Mrs. Carl Spaatz, wife of Lieutenant General Spaatz, is the Air Forces representative for this all-service group.

"Music means a lot to our boys overseas and the least we can do is send them instruments which are now lying about unused," says Mrs. Spaatz, who admits being the only non-musical member of a family which includes a concert-pianist daughter and an accomplished guitar-playing chief of the U. S. Strategic Air Forces in Europe. "We are filling requests all the time for harmonicas and other instruments that can no longer be purchased. All instruments collected should be turned over to the special services officer at any AAF station. He will see that they are put in condition and started on their way."

Communications concerning Music for the Services should be addressed to Mrs. Carl Spaatz, 206 Duke Street, Alexandria, Virginia. ☆



DO YOU NEED A LAWYER?

By Brig. Gen. L. H. Hedrick

The Air Judge Advocate

ILLUSTRATION BY SGT. CHARLES OVERMAN



It takes a specialist to draw an ironclad will or a foolproof power of attorney, so see your AAF Legal Assistance Officer.

The following article is the first of a series written for AIR FORCE by General Hedrick.

JOHNNY SMITH was a conscientious sort. He had worked hard as an automobile salesman, and by the time his induction notice came he had things in shape for his mother and sister to live comfortably for the duration. He had managed, by watching his dimes, to buy a home. The mortgage was small, and with Sis's job and Johnny's allotment there would be enough to keep up the monthly payments. So Johnny was in good spirits the day he went off to war. He had done handsomely by the home folks. Now he was ready to serve his country.

As one would expect of a fellow like Johnny, he made a good soldier. In no time, he won a stripe, then a second, and by the time he went overseas he had a third.

The other day, Sgt. Johnny Smith was killed in action over France.

When his estate came up for settlement, it developed that in arranging things for Mom and Sis, Johnny neglected something important. He hadn't made a will. He had intended to, but, as he told Mom and Sis one night, his was a pretty simple estate and wouldn't require much handling. So he kept putting it off. He put it off too long.

Johnny didn't know how important it was. In the absence of a will, the laws of descent in his home state required that

his property be distributed in equal shares to his mother, his sister and his brother, Bill. Johnny had almost forgotten about Bill. In fact, Bill was the kind of a no-good brother a fellow would just as soon forget.

Today, Bill is insisting that Johnny's house be sold so that he can get his share of Johnny's estate in cash. That's his privilege under the law, and there's nothing Mom and Sis can do about it. They'll have to sell.

A will would have prevented this. With half an hour's trouble and no expense, Johnny could have protected Mom and Sis and left Brother Bill out in the cold where he belonged. The legal assistance officer of Johnny's outfit would have been glad to help.

MAYBE Johnny didn't know there was a legal assistance officer at his field. Or if he did know, maybe he hesitated to bother him with a small matter. The legal assistance officer would have known, as Johnny apparently didn't, that a will may be just as important for a small estate as for a large one. The legal assistance officer, a competent lawyer, would have told Johnny Smith that unpreparedness in legal matters often is costly and even tragic. He would have assured Johnny that the AAF recognizes legal assistance as one of its responsibilities, a service to which military men and their dependents are entitled. It would have been Johnny's for the asking.

Nearly every AAF installation in the United States has at least one legal assistance officer. It is his business to get all men squared away on their legal affairs. Despite the efforts of the AAF in this regard, there are many men overseas today who still need help on legal problems. If, in such cases, a legal assistance officer is not available—this is true in

many places overseas—an AAF enlisted man or officer can get help by writing direct to The Air Judge Advocate, Legal Assistance Division, Headquarters Army Air Forces, Washington 25, D. C. He must, of course, state his problem fully, giving all facts which might conceivably have a bearing on the question.

Every case requires a separate study. It would take volumes to set out a system of rules to cover all wills. It will be the purpose of this article to point out some of the common blunders that get estates into trouble—blunders that almost invariably can be avoided by consulting a lawyer and following his instructions.

Too many men attempt to write their own wills. Thousands of estates have run into trouble because the testator left a homemade will or simply signed a standard will form which he bought at the corner drugstore. A mechanic wouldn't attempt to remove his own appendix. No more should he try to write his own will.

Here is a common difficulty into which untrained will-writers stumble. A will has an attestation clause which must be signed by witnesses who actually saw the testator sign the document and declare it to be his last will and testament. Each witness also must actually watch the other witnesses sign. Many wills have been declared void because one of the witnesses stepped out of the room momentarily and did not see all the signatures inscribed. Others have become worthless because the persons who drew them didn't know that the laws of the States concerned required three witnesses instead of two. Difficulties frequently arise because the witnesses are not available to prove the validity of the will when the time comes for probate. Wills have been scrapped because one of the beneficiaries served as a witness.

Settlement of a simple estate needn't involve tedious legal procedure. Again the case of Johnny Smith—and it is used here because Johnny is just like thousands of other Johnnies in the Army. A competent lawyer or legal assistance officer probably would have advised him to leave his property to his sister in trust for his mother during the balance of the

latter's life, after which it would go outright to his sister. This is often a better arrangement than leaving property to two people jointly, as legal titles grow complicated in proportion to the number of people involved.

Johnny also would have been advised, no doubt, that he could save trouble and expense for his heirs by appointing either his mother or his sister executrix to serve without bond. Unless this is specified in the will, the person appointed by the probate court to administer an estate is required to give a surety bond in an amount equal to the total value of the property other than real estate. In Johnny's case, since he doubtless had complete confidence in both his mother and his sister, a bond would have been unnecessary.

A will can be made to provide all manner of safeguards for the beneficiaries. Suppose, for example, the testator fears that his wife has not the necessary business experience to manage his property until the children come of age. Through his will, he can appoint a guardian. In the absence of such a provision, the probate court normally will place the management of the property in the hands of the children's mother as the closest relative.

HERE is a point about estates that servicemen should read and understand. If the arrears in pay of a man killed in action amount to more than \$500, the Government insists that an administrator be appointed for the estate to make sure that the money gets to the rightful heirs. A will, properly written, names the person who will administer the estate, thus simplifying the court proceedings and expediting payment to the heirs.

A question that stumps many testators is what to do with a will after it is executed. This is important because a lost will is difficult to establish in court. A soldier should send his will home with instructions to the family to put it in a place where it unquestionably will be found in the event of his death. He should inform every person named in the will, especially the executor or executrix, where it is to be kept. If it is to be sent to a person unfamiliar with probate proceedings, he or she should be told that after the death of the testator the will should be taken to the nearest probate court. This is the safe procedure, because the probate court always will be able to advise properly as to the next step.

A will is not something to be tucked away and forgotten. An estate often gets into a jam because the testator fails to change his will to keep it in line with his own financial or family status. A man gets married and forgets to make a new will. Children are born and he fails to change his bequests to provide for them. A man divorces his wife and neglects to name a new beneficiary. Every man should

review his will periodically to make sure that it covers his situation and desires. This is no less important than making a will in the first place. The most satisfactory way to change a will is to make a new one. Erasures and insertions will make it void, and making a codicil—the legal term for a postscript to a will—is as much bother as starting from scratch.

Most people don't know that in some States a will is revoked by the birth of a child. In other States, a child not men-

provide for proper handling of his property while he is away. Take a case. Cpl. Bill Jones is serving overseas. He has an automobile, which his wife is using while he is away. One day, Mrs. Jones has an accident and smashes up the car. The insurance company is willing to pay for the damage, but there is a hitch. Bill Jones will have to indorse the company's check, and Bill is somewhere in the South Pacific.

Bill Jones should have executed a power of attorney giving his wife the authority to indorse checks made out in his name. Of course, one can make the power as broad or as narrow as one wishes. It may authorize the person named in the document to do as he sees fit with whatever property the grantor owns. On the other hand, it may limit the grant of power to indorsing checks or collecting rent on the home.

A word of caution: think well before executing a power of attorney. Keep in mind what it means to authorize someone else to sign your name, to let someone else write checks on your bank account, to let someone else buy for you and sell for you. Be sure that the person to whom you give such authority is completely trustworthy. Be sure that he is capable. Be sure that you can rely on his judgment.

There are limitations on the usefulness of powers of attorney. These should be understood. Since powers of attorney are revocable at will, some individuals and institutions refuse to honor a power of attorney without proof that it is valid and subsisting, and such proof is hard to produce. Likewise, death of the grantor automatically revokes a power of attorney, and it is difficult indeed to prove to the satisfaction of a banker that a fighter pilot based in Normandy is still alive.

It might be good business, therefore, for a soldier, in addition to executing a power of attorney, to transfer his property to the name of his wife or some other close relative in whom he has complete confidence. Then there is no need for his signature in transactions involving his property. This is at least a partial answer to the question of the limited usefulness of a power of attorney.

Most of you who will read this article were civilians not so long ago. You have become engaged in, or are subject to, an extremely hazardous occupation. Because your activities and places of residence are unpredictable from one day to the next, your ability to handle your affairs has been greatly curtailed. Everyone in military service owes it to himself and his family to get and keep his legal affairs in order.

If this article has done no more than to convince you that even a simple estate can bog down when it is improperly handled, it has served its purpose. The answer is to see your legal assistance officer. You cannot afford to wait. ☆



**A good way
to get hurt . . .
and hurt badly . . .
is to jump off a
crew stand.
Use your head and
use a LADDER
always.
You can't help
win the war if
you're laid up
in ward 1.**

tioned in the will gets his proportionate share of the estate just as if the father died without a will—or intestate, as the lawyers say. This intestate share of a minor child must be set aside in a trust fund until he comes of age. It is desirable in most cases to leave the property to adults, either outright or in trust for the children with appropriate provisions as to expenditures for education and maintenance.

A will is, of course, inoperative until after the death of the testator. To a soldier, especially one overseas or expecting to go over, it is equally important to



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.

WHIRLING PROPS—SUDDEN DEATH

Air authorities have been harping on the dangers of revolving propellers since the advent of the first plane. But just recently, six more AAF members were killed when they walked into whirling prop blades.

One of them, a corporal, stepped out of a B-24 before the engines were stopped, took a few steps in the wrong direction and was killed instantly. Then, a navigator forgot to take along his chute, jumped out of the plane to get it after the engines were started and walked right into a prop.

Another trained airman met his death when a pilot landed to discharge a radio operator who had become airsick. In spite of the fact that the engineer had been instructed to watch the man and inform the pilot when he was clear, the radio operator marched directly into the propeller.

This should be enough to prove to skeptics that there isn't any future in wrestling with props. A few men have been known to come out of a prop encounter mangled, but alive. Not very many, however.

PARACHUTING TECHNIQUE

The importance of learning the correct body position to assume before pulling a parachute ripcord was spotlighted in a P-38 pilot's report on an emergency jump into the Pacific.

Improper landing technique, which one AAF pilot failed to correct, caused him to groundloop and damage two planes in as many months. He cracked-up the AT-6 (left) while he was an aviation cadet in advanced single-engine school in Arizona and the P-39 (right) exactly

"I cleared the ship perfectly," the pilot said, "but, unfortunately, I made no attempt to control my body position. When the chute opened my right leg was tangled in the shrouds. The chute billowed open and closed three times before I could pull myself up and get untangled."

As a result of observations and tests, OFS recommends that the jumper have his feet together and legs straight when opening the chute. This position tends to prevent fast tumbling and rolls. With elbows close to his sides, the jumper should look directly at the handle, grasp it and then yank hard.

While in a free fall, it is almost impossible to establish body position in relation to the earth. That fact, however, should cause no undue concern. The important rule to remember is to straighten out, with feet and legs together, before the ripcord is pulled.

ENGINEERING COURSE

So they may become better combat flyers through complete knowledge of their planes, all pilots taking the B-17 course at Hendricks Field, Fla., attend an engineering ground school.

The 48-hour engineering curriculum consists of lectures and lab work. Mock-ups and parts of planes are displayed in the classrooms so pilots can apply theory to actual mechanisms. Thus, a better understanding of the various complex systems is gained.

FIRST-HAND INFORMATION

Pilots in B-24 transition school at Maxwell Field, Ala., now receive weather briefing from meteorology instructors before each mission. Previously, flight commanders obtained the weather information and passed it along to the pilots.

KEEPING TABS ON TRAFFIC

A handy method for recording the position of local traffic is used in the control tower at Chanute Field, Ill.

A chart, approximately 8 by 18 inches, is marked off at half-inch intervals to represent each 500 feet of altitude over the local range. As an airplane is assigned an altitude for "practice range orientation or for actual instrument let-downs, tower operators place a numbered miniature airplane at the proper level on the chart. To the marker recording a transient plane there is attached a card carrying the plane's number and its estimated time over the range.

Thus, the operators, who also handle the voice range, can tell at a glance at what levels planes are flying.

LET THERE BE LIGHT

A flash light is a small object, but the lack of one cost the AAF a medium bomber. It happened on a night mission when the flight engineer had no light to make emergency adjustments.

All flight engineers in that command now draw flash lights before any mission.

sixty days later in Airacobra transition school in Florida. In both mishaps, which were strikingly similar, the right landing-gear was broken off. With the P-39, the pilot disproved the earlier-held theory that a plane equipped with tricycle landing-gear could not be groundlooped.



NAVIGATORS' INFORMATION FILE

Distribution of the new Navigators' Information File is underway. Resembling the Pilots' Information File in size and makeup, NIF contains 224 pages, illustrated in two colors. The book is divided into sections dealing with navigational practices, tactical operations, the navigator's responsibilities, weather and emergency procedure.

Distribution of NIF is governed by AAF Reg. 62-15, 28 February 1944.

A copy is being supplied each rated navigator and navigation cadet through operations officers. Regularly established AAF files, base operations offices, groups and squadrons get two copies. NIF also is available to training activities where needed for instructional purposes.

Overseas theatres and "alerted" areas may obtain NIF, at the direction of the commanding officer, by requisition on the local Air Service Command distribution center.

Whereas PIF is brought up to date on

a regular monthly schedule, it is planned to revise NIF whenever the occasion demands. Revisions may or may not be on a monthly basis.

All rated navigators in the continental United States are required by regulation to read NIF and keep up with revisions, signing a certificate of compliance. Comments, suggestions and criticisms are invited. Address communications: Headquarters AAF, Office of Flying Safety, NIF Unit, 1018 Buhl Building, Detroit 26, Mich.

TO COMPLIANCE CHARTS

To insure prompt compliance with Tech Orders, the 2nd Air Force requires all its units to maintain a daily-posted, ready-reference chart in their engineering offices. Base technical air inspectors keep a consolidated chart, which is made current weekly.

The size of the charts is governed by the number of assigned aircraft.

A code has been devised for marking the charts. The symbols and their meanings:

- Red cross—Immediate action TO.
- Red diagonal—Action as soon as possible.
- Red dash—Action as soon as practical.
- Black cross—Compliance at engine change.
- Black diagonal—Compliance at depots.
- Vertical black line—TO not applicable.
- Green triangle and date—Compliance accomplished.

A rescinded Tech Order is indicated by drawing two red lines through the TO column along with the date. When a plane is transferred to another base, two red lines and the date are placed in the airplane column.

Reproduction of a typical chart is seen at the left.



TRAFFIC SIGNALS FROM SCRAP

To prevent collisions between planes and ground vehicles at Lakeland Field, Fla., tower-controlled traffic signals, one of which is pictured above, have been constructed from scrap materials and installed at intersections of runways and roads.

Lights for each runway are connected on one series and all crossbound traffic can be regulated by the tower attendant's pressing a single button.

Scrap lumber, No. 10 cans, wire, red and green glass, light sockets, 60-watt bulbs and paint were used in producing the signals, which are mounted parallel to the edges of the runways.

DOUBLE CHECK

Failure to check the fluid level in hydraulic systems resulted in two B-25 belly landings at an airfield in the mid-west recently. Henceforth, both pilots and maintenance crews will be responsible for making such checks before flights at that field. ☆

TECHNICAL ORDER NO. AND DATE	DATE TO RECEIVED	FORMS AFFECTED			TO KIT REQUIRED	B-17 F	B-17 F	B-17 G	AT-24
		NO. 100, 41	418	OTHER FORMS					
01-6098-17 4-15-43	5-1-43	60A			YES				2-3-43
01-208F-63 9-22-43	10-1-43	60A		00-208 -2	NO	Δ	Δ	Δ	
01-20E-109 11-30-43	12-11-43	60A			NO	Δ	Δ	Δ	
01-20EF-62 11-2-43	1-4-44	60A			YES	Δ	+	+	
01-20EF-60 1-15-44	2-1-44	60A			YES	+	=	+	
01-20-16 3-18-44	3-20-44	60A		NO-2A 2-20-44	NO	Δ	Δ	Δ	
01-20-16 3-27-44	3-28-44	60A		NO-2A -2	NO	Δ	Δ	Δ	

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.)

CAMP SPRINGS, D. C. — After making a normal landing, a P-47 pilot crashed into a parked refueling unit as he was easing into a ramp. The flyer said he could not see the truck because the sun was shining directly in his eyes.

P & I COMMENT: When visibility is restricted for any reason, a taxiing pilot must halt his plane and wait for wing tip guides.

PERRY, Fla. — A P-40 pilot was directed by a member of a line crew to taxi his

plane off a crowded ramp. He hit a soft spot, nosed the ship up and damaged the propeller.

P & I COMMENT: A pilot must never taxi from a hard surface unless he is absolutely sure of the turf. Complying with requests from careless linemen may get him in trouble. If there is any doubt, he should cut his switches and allow linemen to tow the plane away.

STUART, Va. — The pilot of a B-17E on a celestial navigation mission buzzed this village and several nearby towns. After the demonstration, the plane crashed into the side of a 3,200-foot mountain peak, killing the pilot and all members of the crew.

P & I COMMENT: The course of the mission led nowhere near the crash area. Moreover, the pilot had been briefed to fly at not less than 4,500 feet. The violation of orders cost the life of the pilot, who had decided to buzz his home town, and the lives of ten other men who prob-

ably had no particular interest in a close-up view of a Virginia village at night.

OSCODA, Mich. — A P-40, whose pilot had failed to adjust the rudder pedals, veered to the left on take-off, ground-looped and nosed up. The right pedal was in full forward position and the pilot could not correct for the groundloop.

P & I COMMENT: Always adjust rudder pedals before take-off. Be sure that the rudder is in neutral position when the adjustment is made and that the pedal latch is securely in place.

GOLDSBORO, N. C. — A P-47 pilot, knowing his brakes were defective, taxied his ship down the ramp. His right brake failed to hold when he attempted to stop. The plane swung around on the left wheel causing the right wing tip to smash into a parked plane.

P & I COMMENT: Aircraft never should be taxied when brakes are known to be below par. If the plane must be moved, the pilot should call for a towing tug. ☆

WHAT'S YOUR AIR FORCE I. Q.?

Forget your KP strategy for a moment and give mental heed to this month's AIR FORCE Quiz. It's a toughie, so don't be over-eager. Credit the usual five points for each correct answer. A score of 85 or above is excellent on this one; 70 to 80, not bad; 60, fair; below 60, your guesswork is off the beam.

1. The distance in statute miles from Guam to Tokyo is approximately
a. 450 miles c. 2,650 miles
b. 4,200 miles d. 1,600 miles
2. A flight officer holds a status equivalent to that of warrant officer, junior grade.
a. True b. False
3. The name popularly given to the C-56 is the
a. Skytrain c. Commando
b. Lodestar d. Skytrooper
4. The horsepower developed by each engine of the A-20G is
a. 900 c. 1,200
b. 1,700 d. 1,500
5. The 75 mm cannon in the nose of the B-25 has an effective range of about a
a. Mile c. Quarter of a mile
b. Half mile d. Two miles
6. The P-61 is popularly known as the
a. Black Widow c. Baltimore
b. Kingcobra d. Avenger
7. In ditching a B-17, the landing is best made in a glide with engines off.
a. True b. False
8. The southernmost island in the Philippine group is
a. Luzon c. Samar
b. Mindoro d. Mindanao
9. The Commanding General of the 9th Air Force is
a. Lieut. Gen. Lewis H. Brevelton
b. Lieut. Gen. James H. Doolittle
c. Maj. Gen. John K. Cannon
d. Maj. Gen. Nathan F. Twining
10. A straight line from Rabaul to Tokyo would pass through
a. The Philippines c. The Marshalls
b. The Marianas d. The Solomons
11. The primary circuit is open on a battery system when
a. The engine is idling
b. The switch is off
c. The engine is running at cruising speed
d. The breaker points are open
12. The Jap aircraft popularly referred to as the Tojo is a
a. Two-engine fighter
b. Two-engine bomber
c. Single-engine fighter
d. Four-engine bomber
13. The base pay of enlisted men is increased by what percentage when they serve beyond the continental limits of the United States?
a. 20 percent c. 15 percent
b. 5 percent d. 10 percent
14. The eight .50 caliber guns of the P-47, firing in salvo, can shoot how many rounds per minute?
a. 1,000 c. 2,500
b. 4,000 d. 6,000
15. The normal landing speed of the B-24D is approximately
a. 140 mph c. 125 mph
b. 95 mph d. 105 mph
16. The yearly base pay of an AAF General is
a. \$10,000 c. \$5,000
b. \$15,000 d. \$8,000
17. Two of the three types of ammunition used in aerial machine guns are tracer and armor-piercing. Name the third.
18. The glider CG-13 has a towspeed of approximately
a. 50 mph c. 150 mph
b. 300 mph d. 275 mph
19. McChord Field is located nearest to
a. Pensacola, Fla. c. Seattle, Wash.
b. Dover, Del. d. Santa Fe, N. M.
20. Identify the two controls held by this P-47 pilot:



Answers on Page 63

TROUBLE-SHOOTING URs

(Continued from Page 34)

400 Unsatisfactory Reports from all parts of the world are received by the Air Service Command's UR unit every day and because preservation of lives and materiel frequently hinges on prompt corrective measures, no UR is filed away. As rapidly as each one can be reviewed and tagged with an ASC reference number, it is forwarded to one of the technical sections of the maintenance division.

There a technical specialist examines the UR, checks it against others to see if it reflects a previously reported trouble, consolidates available information for the answer and submits his report for the UR Digest. Sometimes the answer simply is a reference to a newly issued TO. Sometimes it is advice that the trouble covered in the UR resulted from non-compliance with existing directives and instructions.

If the answer is not available to the

ASC or the UR indicates that a change in design or material may be necessary, the report goes to the Materiel Command's engineering division. If defective assembly or workmanship is reported, the UR is channelled to either the production division or the inspection division of the Materiel Command. The division concerned may, in turn, forward the report to the manufacturer for corrective action.

Each agency carries on research and tests and when the fault and method of correction have been determined, appropriate action is taken in the form of issuance of a new TO, change in design or material, modification or more rigid inspection. Disposition of all cases is recorded in the UR Digest.

Greatest hindrance to expeditious handling of URs is the failure of the reporting unit to furnish complete information.

When the red-bordered form contains necessary exhibits and full details concerning previous maintenance or repair,

possibility of sabotage and unusual operational conditions as well as required routine data, action can be taken promptly and production of better equipment and improvement of maintenance procedures will soon result.

If information is incomplete, however, additional correspondence may be required and extensive research and tests to duplicate the reported condition may have to be carried out over a period of several months, thus unnecessarily delaying realization of the UR system's purpose. ☆

PICTURE CREDITS

52: Ewing Galloway and T/Sgt. Roger Coster, AIR FORCE Staff Photographer.

All other illustrations secured through official Army Air Forces and Signal Corps sources.

Requests for prints of photographs for official use and publication appearing in AIR FORCE should be directed to the AAF Photographic Library, Headquarters, AAF, Washington 25, D. C.



To permit paperwork, inescapable even under combat conditions, each compak includes a set of stock records and a portable file desk.

PORTABLE INVASION DEPOTS

By Capt. Robert V. Guelich
AIR FORCE STAFF

Compaks, with a month's supply of plane repair parts, are the ASC's solution of AAF maintenance problems at advanced bases in France.

WHEN our air units moved from the British Isles to captured airdromes and landing strips in France, many of the aircraft maintenance headaches encountered in the early stages of the Mediterranean invasions were averted by the presence of compact 200-pound supply kits, which make up the AAF's new "front line" depot.

These combat pack-ups, or "compaks" as they are termed officially, are the Air Service Command's answer to the problems that plagued many of our early invasion operations—floods of unnecessary supplies, lack of proper repair parts, immobile stock bins and warehouses, shipping losses and the like.

The compaks were developed after extensive conferences with supply experts from all combat theatres, service tests in Sicily and Attu, and months of simulated combat operations at the AAF Tactical Center. The ASC assembled supplies and parts essential to the operation of a group of planes for a period of thirty days, packed them in sturdy, waterproof cases with hinged doors and built-in bins, enclosed sets of stock cards and a file desk—and yet held the weight of each box to 200 pounds. This packaged warehouse was developed for all fighters and bombers, complete to the dash number (P-38G-15).

From 96 to 180 boxes, depending on

the type of aircraft to be serviced, comprise a compak. They contain a month's supply of some 700 items—the repair parts a mechanic needs to keep his plane in flyable condition under combat.

A compak can be moved without cranes, carried on trucks and loaded in a C-47. In the cross-Channel move from England, boxes were loaded in trucks assigned to each air group and ferried to the Continent. On the other side, the vehicles were driven directly from invasion barges to airdromes where ground crews piled out, unloaded their supplies and immediately began their service and repair business. Supplies were given the mobility of men and trucks. The AAF had solved its major problem, moving supplies to advance airdromes as fast as men and planes.

Until November of 1942, the AAF had been limited to defensive operations so its then standard supply system could not be given a fair test. Invasion of North Africa soon showed up the shortcomings of a slow-moving supply organization. This action also proved the need for more scientific packaging of aircraft supplies.

During unloading operations many cases filled with water and sank. Others fell apart from rough handling and their contents were damaged by salt water. Once ashore, many of the crates were too large to be transported through narrow



Designed for transportation by plane or truck and for easy handling at a base, none of the boxes of a compak weighs more than 200 lbs.

French streets, through railroad tunnels and bridges, too heavy to be transported on foreign railway cars. Because of bulk shipment of supplies and inadequate labelling, much equipment piled up at railheads and never reached the AAF units which were expecting it. And no one knew where to find stray equipment for there was no satisfactory stock record or tracing system in existence that could keep up with advancing units.

These experiences in North Africa convinced Col. Oakley G. Kelly, one of the first to work on plans for a maintenance and repair package for squadrons and groups overseas, that a complete change

in the supply system was essential. With his assistants, Maj. Frank Blair and Capt. Gerard R. duKet, he compiled data on the average rate of consumption of spare parts by tactical units. This necessitated provisions for accelerated wear and battle damage in active war zones with compensating allowances for salvagable material. The goal was to eliminate excessive supplies of large and heavy items, such as wings, provide additional quantities of fast moving parts and assure prompt delivery of all items to advance airdromes.

Air Service Command assembled data from all theatres and built the first compaks in time to send two of them by air to Attu in early 1943. Others later were service tested during the Sicilian and Italian invasions. They proved their worth, and soon they were being assembled on a production-line basis at ASC depots throughout the United States.

With the establishment of the 9th Air Force as our invasion air force, mobility and rapid movement were of paramount importance. From November, 1943, until May, 1944, compaks were directed primarily to the 9th Air Force—three for

from which the new planes will operate. When planes and parts meet, they move as a unit to each new airdrome location.

Now that bases have been set up in France, replacement compaks are shipped direct to the operational airdrome without having to be channelled through England. This plan will be followed in future offensive movements in the Pacific and other theatres where our air forces constantly are leap-frogging ahead, necessitating a rapid flow of first and second echelon supplies to each new base, free of the delays encountered in requisitioning and awaiting delivery of minor repair parts from large depots far behind "front line" airdromes.

THIRD echelon maintenance (and some fourth) is accomplished by "service teams" that move up with machine shop equipment to support each combat group. The service team of the 9th Air Service Command includes a service squadron and many of the units formerly attached to the old-type service group. Two teams comprise the new service group and each is responsible for maintenance and repair of one combat group of fighters or bombers. Mobile depots and the permanent ASC depots of England and France back up the forward moving service groups.

Supplies of repair and maintenance parts for the 8th Air Force in England were practically complete for invasion operations as early as January, 1944. By the end of April, the 9th Air Force—living in tents and under strict need conditions in order to "keep mobile"—was prepared

for its ride across the English Channel to operate from continental bases against the Germans. There were a few emergency shipments in C-87s that returned to the States to pick up supplies of new electrically-heated suits, special types of spark plugs and photographic paper and supplies. With the influx of many hundreds of C-47s for airborne operations, there also was a rush to build up supplies for the cargo planes. By the first of May, however, all was in readiness for D-day.

Since exact rate of consumption of the many thousands of parts in all of our combat aircraft cannot be precisely estimated, provision is made for redistribution of surpluses and for rapid replenishment of compaks that have shortages.

From Italy, where the supply of airplane tires was believed to be adequate for at least one year of operational flying, came an emergency order for 4,000 bomber tires. The crisis was severe; Vesuvius had erupted and its molten ashes had solidified to blanket our airdromes like crushed glass. Tires were shredded by the thousands every day. Replacements had to be pulled from every depot in the States and rushed to Italy.

To meet all contingencies, the ASC has evolved a highly efficient system of filling overseas emergency requisitions from its three overseas depots—Newark, N. J., Miami, Fla., and Oakland, Calif. Ninety percent of all emergency requisitions are filled in fifteen days. For the 9th Air Force during invasion operations, many requisitions were filled in forty-eight hours, few in more than ten days. ☆



Before a carton is placed in a compak box, it is waterproofed by being dipped in beeswax.

each group, providing a ninety-day supply, with replacements following.

New problems poured in on ASC as fast as the supplies for the combat pack-ups. The P-51 had an engine change, requiring all new parts, modifications were made in the P-38 and in all other planes. This made it necessary to revise the stock supply tables for each airplane every ten days. Despite continuous changes, ASC accelerated its assembly rate until it was packing supply compaks at the rate of 45 per month in early June.

Each compak is earmarked for specific groups of airplanes before they come off the production line. Upon shipment overseas, the theatre air service commander then directs each compak to the field

To replace damaged wing-tips, boxes of new ones are sent to advanced bases in compaks. Removal of one wing-tip does not disturb the others, for each is anchored and cushioned.



Red Stars and Blue Stars

(Continued from Page 5)

He knew what a "mechanic" was, but the term "engine-mechanic" surprised him and the designation "engineering administration officer" stumped him completely. But these minor difficulties were the only ones encountered in probing into each other's language and nomenclature.

The relations between the officers and men of both armies were exemplary. Our non-coms were especially well treated. Occasionally, a Soviet officer would salute an American sergeant. We, too, were diplomatic enough not to wait always for the salutes of Soviet officers in lower grade.

The Soviet commander seemed to be interested in us personally, and he surprised us by remembering by name those, regardless of grade, who had been in conferences with him and the Red Air Force staff in Moscow.

We were not displeased when Soviet soldiers showed us their wound scars and recounted their military exploits, because we realized their laurels were hard won in battles that had cost their people plenty. Our industrious Soviet engineers invariably were wounded men returned from the front. The clinking of their medals chimed intriguingly with the clanking of the steel mats they so ably laid for our runways.

Sometimes, we learned, you have to boast back at the Reds. They liked that, too. After we had finished a particularly satisfying joint effort of bragging, my Soviet officer companion smiled at me impishly.

"Soviet might plus American technique," he boasted.

"You mean mighty American technique," I bragged, in return.

"Da, Da," he agreed, heartily.

Men of both air forces were always relaxed and comfortable in each others' company. We shared our recreations and many firm friendships were made. Our political conceptions were practically never discussed and neither we nor they gave each other any reason to feel that any differences existed.

While the Reds came to our movies in greater number than we to theirs, their official concerts offered us a most popular form of entertainment. At all concerts the "Star Spangled Banner" was played and the program also included Gypsy jitterbugging and Soviet shimmy for our special benefit.

Some of us were concerned at first about the American soldiers' whistling as

a sign of applause. For the Reds, the whistle is a mark of disapproval. But after an announcement was made at one of the concerts explaining the meaning of the GI demonstration, the Soviets completely reversed their pattern and thereafter whistled with us whenever they were pleased with a performance.

We also were heartily welcomed and hospitably treated by the Soviet civilians. At first our men were restricted to the station areas but soon they were given the freedom of nearby towns and villages,



Finest materials and workmanship went into most structures at the new bases but emergency measures were sometimes required. This control tower, for instance, was built from packing cases.

where they were pampered by the older residents and well liked by the girls with whom they danced at the Soviet Non-Coms club. Russian dance music and steps, except rarely performed folk dances, were found to be of the same type the men had known in America.

Joining us in our outdoor sports, the Reds soon became expert at horseshoes and volleyball and they watched with growing interest when we played baseball. Many of our men played pitch and catch with the Red Army women, who gained additional respect because they threw from the shoulder and not from the hip as most American women do.

But we didn't have to look for favorable evidence about the Soviet Army women. Their hard work and ability were apparent everywhere. With the Red Army men, they stood guard for us, dug trenches, performed dangerous demolition duties, served as crew members on transport planes, drove trucks, unloaded freight, sawed timber and did paperwork.

The army women were friendly but reserved, both they and our men remaining somewhat shy of each other because of the official relationship that existed.

There was less formality on the part of the women KPs who ministered to us like big sisters, coaxed us to take extra helpings at the table, sang to us, kidded with us and learned our language promptly.

Only two days after our arrival, the women were announcing meals by shouting: "Soup's on." And soon their commonest expressions were "what's buzzin' cousin?" and "okey dokey."

We will never forget Tosya who, during our early days at the base area, served us steak three times a day while she sang to us with one of the most charming voices of the countryside.

There were unforgettable scenes as well as personalities in the Soviet project. We can vividly recall, for instance, the moment we thirteen officers, who composed the original AAF echelon assigned to the USSR for the inter-Allied undertaking, sat down for the first of our military conferences in Moscow with the well-groomed, high-ranking officers who were our opposite numbers in the Red Air Force.

And we'll always remember our thoughts as we arrived at the base area in the dead of winter to find practically all the buildings in the neighborhood demolished by the retreating German Army. Available facilities were few and bleak, and trophies of battle still littered the fields. It was hard to visualize that from this scene of chaos could rise the fine bases necessary for the shuttle system.

The landing some months later of the transcontinental photographic mission, which preceded the launching of shuttle-bombing operations, gave us a terrific lift for then we knew achievement of our purpose was at hand.

Finally came the big day. Indescribable was the thrill we experienced when the first group of red-nose, checkered-tail Mustangs flashed over our most-forward airdrome, harbingers of the Fortresses which were only a few miles from completion of the first shuttle run. Nerves tingled as the Soviet Airacobras scrambled up from the base and climbed hell-bent for heaven to give top-cover to the American fighters.

As the bombers settled on the landing strip, we saw complete fruition of months of planning and toil. The big job had been done. Men speaking different tongues but essentially the same language had proved what whole-hearted cooperation between two nations can accomplish. ☆

ON THE ALERT!

TIMELY ADVICE FROM THE AIR INSPECTOR

Administrative ★ Tactical ★ Technical

Matters presented here are informative only and are not to be considered as directives.

► **Know It—Do It—Check It:** The commander of an Infantry regiment overseas told an observer:

"My men know their weapons and tactics thoroughly. My effort is simply to require them to do the things they know must be done—posting security, dispatching patrols, seeking a field of fire, retaining their equipment and making sure that it is in working order. You have to check all the time."

This admonition is as true in the AAF as it is in the Infantry. Most men in the AAF have reached the point where they know what must be done. The pilot knows he must conserve precious gasoline to get back home; the radio operator knows he must adhere to net discipline; the crew chief knows that he must rigidly follow TOs. But knowing is not enough. The job must be done and checks must be made to see that it is done right.

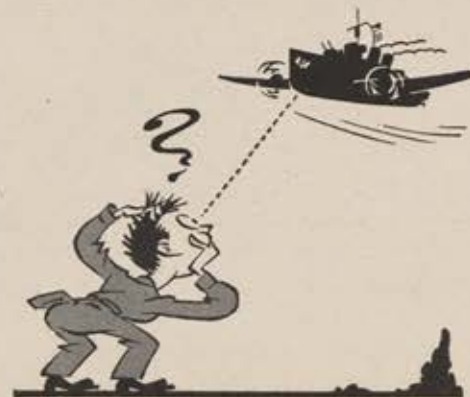
► **Be Sure It's Oxygen:** Are frequent checks made on the receiving and distribution of oxygen and other gases? Servicing of oxygen tanks with a combination of oxygen-hydrogen can cause an explosion fatal to crew and plane.

► **Radio Compass Dehydrators:** Each radio compass dehydrator should be checked to be sure its air vent is not blocked. Reports reveal that in some cases this air vent has been covered with a piece of masking tape, thus preventing the dehydrator from serving its purpose.

► **Radio Silence:** "Hey, Pete, when are you going to raise your wheels?" . . . "You're out of formation, Shorty." . . . This sort of radio chatter on a combat mission may be the tip-off for an enemy reception committee to get busy. An overseas report points out that formations of fighters should be able to take off, form head on course and go to a target without even pressing a mike button. It takes practice with visual signals and plenty of will power—in brief, "air discipline."

► **Service Records:** Most common deficiencies and irregularities noted in inspections of Service Records at Ports of Aerial Embarkation were the following: Failure to show basic training, flying status, immunizations, correct beneficiary or address of beneficiary, reading of Articles of War, sex morality lecture, allotments or discontinuance of allotments and military occupational specialties. These items should be checked frequently.

► **Say 'Plane'—Not 'Ship':** Use of the word "ship" to designate aircraft has led to serious confusion between personnel of the Army and personnel of the Navy, Marine Corps and Coast Guard. All Army personnel will discontinue use of the word "ship" to designate aircraft. (WD Memo. W95-44, 13 May 1944.)



CARTOONS BY JIM RAWLS

Also on the subject of correct terminology, the AAF is now using the term "fighter" in place of "fighter-bomber," "pursuit" and "interceptor." (AAF Reg. 80-3, 12 May 1944.)

► **Co-pilot:** It is imperative that the co-pilot know the pilot's job almost as well as the pilot does himself. The co-pilot is never "sold short" in combat organizations overseas.

► **Officers' Messes and Clubs:** With some Army airbases and other installations closing or curtailing operations, officers' messes and clubs are facing the problem of dissolving or of fitting their needs to a lesser number of officers. This requires good sound management and planning.

If a field closes, the mess or club usually must be liquidated on short notice. Sufficient cash must be available at once to pay off all obligations. The sale of equipment and other fixed assets in a hurry may prove difficult or even impossible. If the cash reserve is inadequate, the officers on duty at the base may be required to "dig" for whatever amount of money is short. At stations where the number of officers is being curtailed, the club or mess operation must be sharply reduced to put it on a self-supporting basis.

Each commanding officer and each member of a board of governors of an officers' mess or club should take inventory of the situation now and make sure that these institutions are operating on such a basis that there will be no embarrassment if the station is closed or its program curtailed.

► **Your Shoes:** Let's be practical about the care of shoes. Par. 13b (4) (c) 3, AR 615-40, requires regular application of properly prepared lubricants (dubbin). In some instances this directive has been disregarded because the use of dubbin on

shoes makes a high gloss impossible. The use of dubbin, however, prolongs the life of shoes, keeps them soft and comfortable and makes them more waterproof. Therefore, at inspections it must be insisted upon that shoes be well cleaned, dubbed and brushed. It isn't necessary that they "sparkle." (Sec. III, WD Cir. 182, 1944.)

Attention is also invited to WD Cir. 168, 1944, which restricts sales and purchases of shoes by all Army personnel. All military personnel will cooperate in conserving shoes and acquire the minimum number of shoes compatible with their needs.

► **Watch It, Mechanic:** Inspections show the need for more care by maintenance personnel while making repairs to prevent foreign matter, such as metal filings, wire, bolts and rivets, from entering recesses and causing damage to aircraft and engine.

► **Emergency Procedures:** Aircrew members are reminded that in a tight spot they may be only as good as their ability

to carry out emergency procedures—repairing guns in flight, operating auxiliary radio equipment, bailing out, ditching the plane, and so on.

► **Bottles, Caps and Containers:** All AAF personnel who want to assure a continued supply of refreshments at their Exchange (and who doesn't), must do their bit in the conservation of bottles, caps and containers. Because of the acute shortage of these articles, Sec. V, WD Cir. 137, 1944, directs that the highest possible degree of conservation and salvage be exercised.

► **Lights Out:** Keesler Field, Miss., went all out on the light saving program and reduced its power consumption for a month 11.4 percent, a saving of more than \$1,000. A contest for the best suggestion for saving electricity was won by Pfc. George DeBoer, who recommended that someone in each barracks and office be responsible for turning off lights not needed. He was awarded a \$50 war bond.

Additional light savers recommended for general adoption:



Keep only a single night light burning in the latrine. Turn on others as needed.

Refrain from using oversize lamps or unauthorized electrical appliances.

Do not use orderly rooms or offices after hours for visiting, personal letter-writing or other unofficial activities.

► **Lights On:** Are all field obstacle lights operating? ☆

HERE ARE THE ANSWERS

Q. How is an individual carried on the organization Daily Sick Report when hospitalized at a station other than that to which assigned?

A. The Adjutant General advises that "if an individual is sent from a station hospital to a regional station hospital, to a station hospital at another post, or to a general hospital, for further observation and treatment, his name will be entered on the Daily Sick Report of his organization on the date of the change



of his status, the disposition being entered by the medical officer of the unit as 'transferred to . . . hospital (place) for observation and treatment and observation only.' The enlisted man's name will not be carried on the Daily Sick Report of his organization thereafter unless he is returned to his organization and needs additional hospitalization. If the individual is sent to a regional station hospital at his home station from a dispensary, entry will be made on the Daily Sick Report as long as he is hospitalized at that hospital."

Q. May a private, under Sec. V, WD Cir. 287, 1942, filling the T/O position of a staff sergeant, receive the pay and allowance of a staff sergeant?

A. No. The Adjutant General advises that the cited circular was not a

directive authorizing the promotion of enlisted men to the grades of first sergeant and staff sergeant without the issuance of proper orders by competent authority, but was instead a change in the distribution of enlisted grades. The circular in no way changed the regulations which require that appointments to enlisted grades be made by written orders issued by properly designated authority.

Q. May time as a commissioned officer in the Women's Army Auxiliary Corps be counted in computing eligibility for promotion as a WAC officer?

A. Yes. Commissioned service in the WAAC will be counted. (Par 4d [4], AAF Reg. 35-18, 20 April 1944.)

Q. May allotments to dependents (Class E) be made for any period desired?

A. No. All Class E allotments will be made for an indefinite period. If through error an expiration date or period is indicated, it will be disregarded by the Office of Dependency Benefits. Class E allotments will continue to be paid by the Office of Dependency Benefits until a request in writing for discontinuance is received by that office.

Q. May an officer count time in the RCAF in the computation of service as pilot?

A. Yes. Officers, warrant officers, flight officers and enlisted men of the

Army of the United States, on duty with the AAF, will be credited with service as a rated pilot of heavier-than-air aircraft in the armed forces of co-belligerent nations at 100 percent. Senior and Command Pilot ratings, however, will continue to be granted upon the basis of service as a rated pilot in the military or naval service of the United States. (AAF Memo. 35-39, 20 May 1944.)

Q. Is an enlisted man still required to keep his WD AGO Form No. 28 (Soldier's Individual Pay Record) in his personal possession at all times?

A. Not at all times while in the continental United States. Par. 12, ch. 9, 31 March 1944, AR 345-155, states that the enlisted man is required to carry the individual pay record book on his person when traveling individually or away from his organization, and at all times when outside the United States.



Roll of Honor

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

DISTINGUISHED SERVICE CROSS

Blakeslee, Donald J. M., Col.
Brown, Henry W., Lt.
Conger, Paul A., Capt.
Corl, George P., T/Sgt.
Fields, Virgil G., Jr., Maj.
Haberle, Frank J., Lt.
Johnson, Robert S., Capt.
Lukic, Carl J., Lt.
Mehler, William A., T/Sgt.
Schiffing, David C., Lt. Col.
Smith, Donavon F., Lt.
Steele, Henry P., Lt.
Truluck, John H., Lt.
Woody, Robert E., Capt.

DISTINGUISHED SERVICE MEDAL

Chauncey, Charles C., Maj. Gen.
Connell, Carl W., Brig. Gen.
Eaker, Ira C., Lt. Gen.
Hoag, Earl S., Brig. Gen.
Wilson, Donald, Brig. Gen.

LEGION OF MERIT

Alexander, Frank, M/Sgt.
Arnold, Leslie P., Col.
Bailey, Charles F., M/Sgt.
Baldwin, William G., Lt.
Beckman, Milton R., Maj.
Bullen, Theodore L., Lt.
Borchardt, Bernard B., M/Sgt.
Borum, Fred S., Brig. Gen.
Brooks, Russell J., Sgt.
Brown, Robert C., Maj.
Bryan, William H., M/Sgt.
Hurt, Byron T., Jr., Col.
Burdell, Harvey S., Brig. Gen.
Caldwell, Jack E., Col.
Connelly, William F., M/Sgt.
Craig, Laurence C., Brig. Gen.
Douglass, Kingman, Col.
Dye, Josiah E., M/Sgt.
Egway, Charles G., S/Sgt.
Fox, Francis I., M/Sgt.
Glover, Joe Tom, Jr., Capt.
Goodwill, Forrest W., M/Sgt.
Groudis, Walter J., M/Sgt.
Graham, Harold D., T/Sgt.
Hagins, Newton D., Maj.
Harrington, Vincent F., Maj.
Herman, Isadore, Capt.
Hezlep, John B., T/Sgt.
Ingersoll, Harold B., Maj.
Ivers, James, Jr., Capt.
Jackson, William H., Lt. Col.
Johnson, Bernard F., Lt. Col.
Marshall, Warner, Jr., Capt.
Myers, John A., Capt.
Ohlke, Harold W., Col.
Owens, Ray L., Brig. Gen.
Petrousky, Joseph A., M/Sgt.
Pucci, Joseph, T/Sgt.
Royce, Ralph, Maj. Gen.
Sadovsky, Charles, Capt.
Sauvage, Russell E., Maj.
Schenck, Earl L., W/O
Smith, Sory, Col.
Sorensen, Karl L., M/Sgt.
Standish, Alexander, Maj.
Sturm, Peter K., Capt.
Sutterlin, Frederick J., Col.
Teats, Edward C., Lt. Col.
Tenney, Frank F., Jr., Capt.
Tipton, James V., M/Sgt.
Ulosovich, Michael, M/Sgt.
Usher, George L., Brig. Gen.

SILVER STAR

Akers, Wayne H., T/Sgt.
Albright, Charles O., T/Sgt.
Baer, Alton, Jr., S/Sgt.
Barlow, William N., S/Sgt.
Beckham, Walter C., Capt.
(& OLC)
Beeby, Barclay B., Lt.
Bigham, Harvey H., T/Sgt.
Blakeley, Everett E., Capt.
Bolick, Robert H., Lt.
Bowman, Charles H., Lt. Col.
Brooks, Norman E., Lt.
Butler, William David, Lt.
Cely, William F., Lt.
Class, Kenneth A., T/Sgt.
Conley, James W., Lt.
Conley, Robert J., S/Sgt.
Craig, Horace C., Maj.
Crapsey, Arthur H., Lt.
De Mara, Marco, Lt.
Derrick, Charles E., Sgt.

* Posthumous

Dobbs, Max F., S/Sgt.
Dowell, Kenneth F., Lt.
Duke, Alexander, Lt.
Edwards, George P., Lt.
Everett, Le Roy B., Jr., Capt.
Farrell, Frederick B., Lt.
Ferguson, Joe C., S/Sgt.
Florenti, William J., S/Sgt.
Forsythe, Robert E., Jr., Lt.
Gabreski, Francis S., Maj.
George, Louis R., Lt.
Glenn, Joseph A., Jr., Capt.
Green, Raymond E., Lt.
Griffith, Rockford C., Lt.
Hendrick, William J., Lt. Col.
Hubbard, Glenn E., Maj.
Jeffrey, Thom Stanley, Jr., Lt. Col.
Joel, Milton, Maj.
Jones, William M., Capt.
Kidd, John B., Lt. Col.
Kreidler, Howard E., Maj.
Ladd, Kenneth R., Lt.
Lamont, Howard, S/Sgt.
Laszewski, Emil S., Lt.
Lauterbach, Theodore G., Lt.
Liscomb, John P., Capt.
Lord, Marvin D., Capt.
McCarraher, Edward R., S/Sgt.
McConnell, Bernard E., T/Sgt.
Magnuson, Clifford E., Lt.
Miller, Paul B., Jr., Lt.
Morwood, Roger, Lt.
Mullins, Grover C., T/Sgt.
Mumford, Harry G., Lt. Col.
Murtha, Regis J., Lt.
Nelson, Anton L., T/Sgt.
Normand, Charles G. Y., Lt. Col.
Norton, Harvey B., Sgt.
Osborne, Robert J., Capt.
Owens, Joel A., Jr., Capt.
Parsons, Leonard A., S/Sgt.
Pecosky, Michael, S/Sgt.
Post, Robert F., Maj.
Prater, Clifford J., S/Sgt.
Pridder, George E., Capt.
Reim, William E., S/Sgt.
Rimerman, Ben, Maj.
Rudell, Raymond F., Maj.
Smith, Albert E., T/Sgt.
Thorus, Louis G., Lt. Col.
Timme, Arthur C., Sgt.
Valenta, Irvin E., Lt.
Watts, Ernest L., Lt.
Wheaton, Elmer M., Capt.

OAK LEAF CLUSTER TO SILVER STAR *

Travis, Robert F., Brig. Gen.

DISTINGUISHED FLYING CROSS

Allen, George C., Lt.
Allen, Glenn R., S/Sgt.
Allen, James G., Lt. (& OLC)
Allen, John Harold, T/Sgt.
Allen, John P., Jr., Lt.
Allen, Ronald S., Lt.
Allen, Roy H., T/Sgt.
Allen, Robert E., S/Sgt.
Allen, Robert E., Jr., Lt.
Allen, William G., Cpl.
Alley, Bert A., Lt.
* Allison, Andrew J., S/Sgt.
Allison, George A., T/Sgt.
(& OLC)
Allison, Robert G., Jr., Lt.
Allison, Dale W., Sgt.
Altum, Ethan E., S/Sgt.
Altizer, James H., Sgt.
Altman, Allen A., T/Sgt.
Amacker, Homer J., T/Sgt.
Amick, Cecil Denham, Lt.
Ammons, Vernon G., Lt.
Amphlett, Jack B., Lt.
Anderhald, Virgil J., S/Sgt.
Anders, Forrest S., Lt.
Anderson, Arnold R., S/Sgt.
Anderson, Charles D., S/Sgt.
Anderson, Charles L., Lt.
Anderson, David M., Lt.
Anderson, Donald G., Lt.
Anderson, Dwight K., Lt.
Anderson, Edmund B., Lt.
Anderson, Eugene C., Lt.
Anderson, Everett M., Sgt.
Anderson, Garnet W., Lt.
Anderson, George R., Lt. Col.
Anderson, John H., Capt.
(& OLC)
Anderson, John L., T/Sgt.
Anderson, John M., Sgt.
Anderson, Joseph A., Maj.
Anderson, Kenneth M., Lt.
Anderson, Melvin M., Lt.
Anderson, Milton A., Lt.
Anderson, Noel M., Lt.
Anderson, Ray U., S/Sgt.

Anderson, Robert A., Cpl.
Anderson, Robert H., Lt.
Anderson, Robert F., Lt.
Anderson, Samuel E., Col.
Anderson, Wilbur M., F/O
Anderson, William E., Jr., T/Sgt.
Anderson, William G., S/Sgt.
Anderson, William L., Lt.
Anderson, William W., Jr., Lt.
Andrusci, Lewis F., T/Sgt.
Andrews, Aaron L., Lt.
Andrews, Allen L., Lt.
Andrews, Charles C., Capt.
(& 3 OLC)
Andrews, Gordon J., F/O
Andrews, Walter E., Sgt.
Andrews, Willie A., T/Sgt.
Andridge, Herbert W., Jr., Lt.
Angel, Gordon, S/Sgt.
Arnold, David W., Capt.
Arnold, Robert M., S/Sgt.
Aronack, Sanford N., Lt.
Aronet, Harold, Lt.
Aranson, Albert M., Lt.
Arooth, Michael, T/Sgt.
(& OLC)
Arrieta, Mark B., S/Sgt.
Arvidson, Clement S., S/Sgt.
Baddis, Nicholas, T/Sgt.
Baird, Joseph C., Sgt.
Baird, Robert W., Jr., T/Sgt.
Baisden, Ira R., S/Sgt.
Bakeberg, Arthur O., Sgt.
Baker, Charles F., Lt.
Baker, Harold, S/Sgt.
Baker, Harrell W., S/Sgt.
Baker, Harry J., Lt. (& OLC)
Baker, Howard D., Cpl.
Baker, Jack R., T/Sgt.
Baker, Joe B., Jr., Capt.
Baker, John H., S/Sgt.
Baler, Sterling A., Lt.
Banks, Warren B., Lt.
Banks, William D., Lt.
Banks, William M., Capt.
(& 2 OLC)
Banner, Robert R., S/Sgt.
Banning, Richard E., Lt.
Banta, Jack O., S/Sgt. (& OLC)
Banta, Keith B., S/Sgt.
Barba, Andrew M., Lt.
Barber, Edwin L., T/Sgt.
Barber, Keenan G., Capt.
Barber, George A., Lt.
Barbour, Charles C., Lt. (& OLC)
Barbus, Paul L., S/Sgt. (& OLC)
Barcak, George J., Lt.
Barclay, Billie B., Lt.
Barnes, Charles J., Lt.
Barnes, Donald A., Lt.
Barnes, George R., Lt.
Barnes, Joshua H., Jr., Capt.
Barnes, Lloyd C., S/Sgt.
Barnes, Russell L., S/Sgt.
Barnett, Charles E., T/Sgt.
Barnett, George C., S/Sgt.
Barnett, Thomas C., T/Sgt.
Bartholomew, Aubrey R., S/Sgt.
Barton, Harold H., Lt.
Barton, Ivan K., Sgt. (& 2 OLC)
Barton, James R., Lt.
Barton, Roger D., Lt.
Barts, Robert I., Sgt.
Bartuska, George Jr., Lt.
Bartz, Richard A., T/Sgt.
Baryovitch, Stanley, T/Sgt.
Beck, Robert H., Lt.
Beck, Walter W., F/O
Beck, William J., Jr., Capt.
Becker, Clyde S., Cpl.
Becker, Donald W., Lt.
Becker, Raymond Arthur, Lt.
Becker, Robert L., Lt.
Becker, Robert W., Lt.
Beckstrom, Kenneth W., Lt.
Bedford, Franklin P., Lt.
Bedford, John R., Lt.
Bedwell, Philip G., S/Sgt.
Beebe, Eugene H., Col.
Beem, Arlo D., S/Sgt.
Beeman, Chas. R., Jr., S/Sgt.
Beers, Leonard A., S/Sgt.
Beerwerth, Dillman J., S/Sgt.
Beeson, Henry R., Lt.
Behan, Joseph F., Lt.
Behr, Herbert A., Lt.
Bek, Philip L., Lt.
Bell, Charles A., Lt.
Bell, Eulon C., Jr., S/Sgt.
Bell, Howard D., S/Sgt.
Bell, Jack B., Lt.
Bell, James L., Lt.
Bennett, Hugh D., Lt.
Bennett, Jack W., Jr., Lt.
Bennett, James W., Lt.
Bennett, Joe L., Lt.
Bennett, John W., Lt.
Bennett, Kenneth G., Lt.
Bennett, Lewis T., S/Sgt.
Bennett, Norman E., Jr., Lt.
Bennett, Richard L., Lt.
Bennett, Robert L., T/Sgt.
* Bennett, Robert R., Lt.
Bennett, Stuart M., Lt.
Bennette, Thomas W., Jr., Lt.

Berry, Austin L., Maj.
Berry, Henry F., T/Sgt.
* Berry, John B., T/Sgt.
Berry, Rex, Lt.
Berry, Richard T., S/Sgt.
Berry, Robert K., Lt.
Berth, Donald R., S/Sgt.
Bertrand, John R., Lt.
Berzansky, Andrew, T/Sgt.
Binning, Bud B., Lt.
Birchard, Glen H., Lt. Col.
Bird, Donald C., Sgt.
Bird, Ira M., Lt.
Bird, Luther C., Lt.
Birlew, Donald W., Capt.
Bisgard, Richard L., Capt.
Bishop, Earl C., Jr., Lt.
Bishop, John W., Lt.
Bishop, Leicester B., Lt.
Bishop, Lyle D., Lt.
Bishop, Paul A., Lt.
Bishop, William H., Pfc.
(& OLC)
Biskup, Ernest, S/Sgt.
Bissel, Ray, Cpl.
Bittney, Robert V., Lt.
Bitter, Emile V., Jr., S/Sgt.
Bitter, Frederick J., Lt.
Bixler, Gordon H., S/Sgt.
Blackly, Ross L., Lt.
Black, Perry O., Lt.
Black, Robert C., Lt.
Black, Robert E., Lt.
Blackburn, Daniel B., S/Sgt.
Blackledge, Lyle P., S/Sgt.
Bleeker, William R., Lt.
Blevins, Paul R., Lt.
Slight, Charles W., Lt.
Bliss, Charles R., Lt.
Blitz, Rudolph C., Jr., Sgt.
Bleche, Arthur H., S/Sgt.
Blocher, Maurice H., S/Sgt.
Block, Joseph M., Lt.
Block, Robert C., S/Sgt.
Blockman, Clifford H., S/Sgt.
Blockman, Elmer E., F/O
Bodell, Walter, S/Sgt.
Bodenhamer, Don, Jr., Lt.
Boeldt, Robert O., T/Sgt.
Boet, Paul J., S/Sgt.
Boffa, William E., Sgt. (& OLC)
Bohland, Richard, S/Sgt.
Bohman, Carl V., Capt.
Bohnert, Herbert J., Jr., Lt.
Bohney, Richard H., Lt.
Boisclair, Leonard D., S/Sgt.
Boiteau, John A., S/Sgt.
Boisack, Charles K., Lt.
Boisack, Meris, Sgt.
Boley, Lyle T., Lt.
Boiling, Charles, S/Sgt.
Boiling, James A., Lt.
Bologna, Joseph M., T/Sgt.
Boly, William A., T/Sgt.
Bomar, John E., Lt.
Bomcien, William J., Lt.
(& 2 OLC)
Bond, Robert D., Lt.
Bonner, Hughie R., Lt. (& OLC)
Bonnickson, Andrew P., T/Sgt.
Bonones, Luther P., S/Sgt.
Bonsteel, Francis T., Lt.
Bonus, Robert M., Capt.
Booker, Cleburn U., S/Sgt.
Booker, Dennis G., Lt.
Boone, Joseph H., Lt.
Boone, Louis E., T/Sgt.
Boone, Mark P., F/O
Booth, Douglas E., Lt.
Booth, William H., Maj.
Bradley, Raymond A., Capt.
Bradrick, Leroy, S/Sgt.
Bradshaw, Fred D., Capt.
Bradt, Tony L., Cpl.
Brady, Henry G., Jr., Maj.
Brady, John D., Lt.
Brady, William R., S/Sgt.
(& OLC)
Brady, Willis E., Lt. (& OLC)
Braddon, Richard H., T/Sgt.
Bragman, Chas. R., Jr., Lt.
Braggs, Wayne A., Lt.
Brale, Richard G., Lt.
Braman, Jay L., S/Sgt.
Bramer, Delmer C., T/Sgt.
Branch, James L., S/Sgt.
Brice, Winston R., S/Sgt.
Brandas, Dale F., T/Sgt.
(& OLC)
Brandon, Lloyd A., S/Sgt.
Brandt, Martin D., S/Sgt.
Brandt, William M., Lt.
Brannan, Henry P., S/Sgt.
Brice, Winston R., S/Sgt.
Bridges, James N., Lt.
(& 2 OLC)
Bridges, Phillip, Capt.
Briggs, Wayne F., S/Sgt.
Brightman, Jack M., Lt.
Brill, Carlos O., Sgt.
Brimberry, Will O., Lt.
Bridley, Arthur E., M/Sgt.
Brinkley, Frederick A., Lt.
Brinkley, Ralph F., Lt.
Brinkman, John T., S/Sgt.

Brown, Harry L., T/Sgt.
Brown, Harry M., T/Sgt.
Brown, Harry W., Capt.
Brown, Howard T., S/Sgt.
Brown, Jack O., Lt.
Brown, Jack O., Capt.
Brown, Jack R., Lt.
Brown, James C., Lt.
Brown, James J., T/Sgt.
Brown, John D., Sgt.
Brown, John K., Jr., Col.
Brown, John T., Jr., Lt.
Brown, Keith S., Lt.
Brown, Kenneth Jr., Lt.
Brown, Kenneth V., T/Sgt.
Brown, Lawrence R., Pfc.
Brown, Leonard H., Lt.
Brown, Lewis E., F/O
* Brown, Maxton, Lt.
Brown, Noble, T/Sgt.
Bruce, Forrest D., S/Sgt.
(& 2 OLC)
Bruce, Robert D., Jr., Capt.
Bruch, George A., S/Sgt.
Bruckheimer, David O., Lt.
Brumagin, Delores R., T/Sgt.
Brune, Edwin E., S/Sgt.
Bruni, Edwin J., Lt.
Bruner, Robert Melvin, T/Sgt.
Brunswick, Carl J., T/Sgt.
Bruskotter, James E., S/Sgt.
Bryan, Archie L., S/Sgt.
Buchanan, Walter E., Lt.
Buchanan, William D., Lt.
Buchinsky, Frank J., Lt.
Buck, Ambrose H., Lt.
Buckalew, Samuel E., Jr., S/Sgt.
Buckhardt, Clyde L., S/Sgt.
Buckingham, Elvin E., S/Sgt.
Buckle, Henry C., T/Sgt.
Buckley, William P., Capt.
Buda, William J., S/Sgt.
Burbank, Fred C., Capt.
Burchard, James, Cpl.
Burdick, William A., Lt.
Burford, Edgar C., Lt.
Burgess, Curran A., Capt.
Burgan, Virgil, S/Sgt.
Burge, Lawrence E., Lt.
Burger, Roger H., Lt.
Burgess, Elwyn C., S/Sgt.
Burgoyne, George E., Lt.
Burke, Charles A., T/Sgt.
Burke, William P., Capt.
Burke, Jack C., S/Sgt.
Burkley, Harry R., Lt.
Burkot, John S., S/Sgt.
Burley, Enoch P., Lt.
Burnett, George F., Jr., Lt.
Burnett, Harry, Jr., Lt.
Burnett, Robert F., Capt.
Burnham, Arthur L., S/Sgt.
Burnor, Richard H., Lt.
Burns, Harmon E., Capt.
Burns, John P., Capt.
Burnside, Ernest W., S/Sgt.
Cabas, Victor M., Lt.
Cameron, Harold D., Jr., Lt.
Cameron, William D., Capt.
Cameron, William R., Maj.
Cammack, Herbert R., T/Sgt.
Camp, Frank B., Capt.
Camp, Reimond O., Lt.
Campbell, Matthew J., Sgt.
Campbell, Benton D., S/Sgt.
Campbell, Claude W., Capt.
Campbell, Clyde, T/Sgt.
Campbell, Curtis K., Lt.
Campbell, Henry L., Lt. (& OLC)
Campbell, Herbert J., T/Sgt.
Campbell, Jack L., Lt.
Campbell, Leland V., S/Sgt.
Campbell, Leonard N., Lt.
Campbell, Ralph K., Lt.
Campbell, Richard A., Lt.
(& OLC)
Campbell, Robert B., Capt.
Campbell, Robert L., Lt.
Campbell, Robert W., Lt.
Campbell, Thomas S., T/Sgt.
Campbell, William B., Lt.
Campbell, William F., Lt.
Caputo, John A., Lt.
Carbery, Duward A., S/Sgt.
(& OLC)
Carciene, Anthony R., Lt.
Card, John H., III, Lt.
Card, Robert G., S/Sgt.
Cardamon, Frank M., S/Sgt.
Cardwell, Burt J., Lt.
Cardwell, Kenneth H., Lt.
Care, Raymond C., Lt.
Carens, Vernon H., S/Sgt.
Carey, John A., Capt.
Carey, Max R., Capt.
Carey, Richard C., S/Sgt.
(& OLC)
Cargill, William D., Lt.
Carlin, Henry J., Lt.
Cartile, Guernsey I., Capt.
Carlow, Earle W., Lt.
Carlow, Carl R., Lt.
Carlson, Arthur L., Lt.
Carlson, Clyde P., Lt.

(Continued on Page 57)

GROWTH OF OUR CIVILIAN AAF



Civilian employees of the Air Service Command are seen as they learn construction details of an aircooled engine. Scenes like this have been common since 1941 when the AAF began training 500,000 men and women for the world's largest undertaking in aircraft overhauling and repair.

By Brig. Gen. Elmer E. Adler

CHIEF, PERSONNEL AND TRAINING DIVISION, AIR SERVICE COMMAND

“WANTED: Half a million men and women for vital jobs in the AAF; technical skills required for eighty percent of applicants.”

This was the civilian force needed when the AAF started to build the world's largest aircraft repair industry in the fall of 1941. During the following two years, despite keen competition for machinists and experienced mechanics from the booming aircraft industry, 500,000 men and women were employed, trained and molded into the AAF's Air Service Command—the home-front repairmen and stockboys for our sixteen Air Forces throughout the world.

Today, these civilians are doing the technical job in the States that GIs are doing overseas—overhauling engines, repairing damaged aircraft and equipment, expediting the flow of supplies from warehouses and embarkation points to our bases in theatres of operations.

But few of these employees had any technical skills. Thirty-four percent were men over 38 years of age who had to be trained for new jobs—engine maintenance, repair of accessories, machine shop work, job and shop supervising. Forty-four percent were women, many of whom never had worked before. They had to be trained for clerical work and office supervision as well as for repair and overhaul of aircraft.

Before ASC could begin servicing and supplying the mushrooming AAF, it had to embark on an extensive training program—a program for which there was no

pattern. Although confronted by problems never before tackled on a large scale by any government agency, ASC successfully developed a civilian training organization—one of the first formally established under the War Department—which was distinctive not only in size and the wide number of technical subjects taught, but in the fact that it was a “full-time” operation.

When the Air Service Command was created in October, 1941, apprenticeship courses for the few hundred civilians being trained lasted four years. Imminence of war and increasing production of planes necessitated rapid expansion of repair and supply depot personnel, so the courses were consolidated and shortened to six month periods and less. Still, the training program could not accommodate the thousands of civilians being employed each week.

Specialized courses in engine assembly, stock records, gyro instrument repair and about seventy other subjects were standardized. Because existing textbooks and manuals were too old and involved, 150 new training manuals were written to speed up the educational program; instruction was limited to periods of two to fifteen weeks. Actually, training was put in capsule form and prescriptions were made according to the qualifications and adaptability of each new employee. Ultimately, civilians were trained for new and specialized jobs at the rate of 60,000 a year—more than any other school or university in the world.

How 500,000 men and women were molded into the world's largest aircraft repair industry since the fall of 1941.

Although ASC was destined to grow into one of the largest semi-industrial organizations ever conceived, training proved to be more than a problem of mass production. In addition to mechanics and stock clerks, there was a need for shipping and transportation experts, office managers and personnel advisors, aeronautical and civil engineers, purchasing agents and contract lawyers, accountants and financial consultants. All of these had to be trained in new and specialized phases of work before they could be molded into their important roles as an unmilitarized civilian army expediting the logistical requirements of the AAF's aerial battles against the enemy.

Major problems through all stages of this industry-building program were to obtain personnel in the face of competition for skilled labor by essential war industries and competition for draft-eligible personnel by the armed services.

ONE of the greatest handicaps in obtaining personnel was the wage advantage which private industry held, in many localities, over the Civil Service rates which ASC installations were required to pay. After many months of experience and planning, and based upon ASC's comprehensive, detailed breakdown of its mechanical and unskilled trades (the only classification ever made of 950 previously ungraded jobs), a locality wage plan was developed by Headquarters, Army Air Forces, approved by the War Labor Board and later adopted by all of the air force commands, which permitted AAF installations to meet private industry wage scales according to prevailing rates and living costs in their respective localities.

To avoid hindering ASC's operations while releasing draft-eligible men for military service presented a paradoxical problem. The men were needed as civilians in the AAF, yet expansion of the Army necessitated drafting them. Because induction of large numbers of them before replacements had been trained would actually have hindered the AAF, their orderly withdrawal was effected by adapting the replacement schedule system, which had been developed by Selective Service Headquarters, to the peculiar deferment situation which existed in the ASC installations. This adaptation proved

extremely satisfactory and earned the commendation of the War Department's Deferring Committee. Air Service Command personnel who were responsible for working out the first of these ASC schedules were later called upon by Headquarters, Army Air Forces to assist other AAF installations.

AFTER we had procured new employees, we were confronted by the difficult problem of properly training them for jobs. Mechanical aptitude of our applicants dropped so low that we had to introduce a special course on the use and care of basic hand tools for many of the people we were forced to accept for mechanic training didn't know how to hold a wrench or hammer. It was a pleasant surprise, therefore, to discover that these persons, with little or no knowledge of tools, were eager to learn their proper use and caught on quickly when shown how to handle them.

Simultaneously, at the other extreme we were teaching our highly skilled technicians to repair and adjust a new, delicately designed auto-pilot, with its gyroscopes and its scores of electrical and control cable connections.

Rapid expansion of shop facilities and personnel made it essential to inaugurate courses for supervisors and foremen. The training courses of ten to twelve hours in private industry were developed into a comprehensive 52-hour course by ASC, and more than 21,000 men and women have learned shop supervision from this course.

Job management was the central theme of the early classes; experience taught that additional emphasis was necessary on personnel relations and on analysis of job efficiency under each supervisor. At the same time, because the young foremen were subject to the draft, more stress was directed to the necessity of passing on knowledge to subordinates who might have to replace department heads.

Supplementing the job and supervisor

training programs are on-the-job instructional courses to facilitate upgrading of employees. An average of 500 workers a month are sent to factory schools to familiarize themselves with new equipment. These workers then return to conduct shop classes, teaching other workers new repair and maintenance procedures.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ HELP . . .

★ circulate AIR FORCE so that
★ every man in your activity
★ gets a chance to read the
★ service journal. Don't let
★ this copy become a "gold
★ bricker"—keep it working.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ READ IT . . . PASS IT ON!

The educational program also utilizes the facilities of thirty state-supported co-operating schools and two contract schools. In the twelve main ASC depots, more than 200,000 have received pre-service training.

As students, men and women are treated alike; in machine shop work, welding, instrument repair and stock tracing, women generally are better than average, while they are frequently as good as men in the heavier sheet metal work and aircraft repair. Approximately 90,000 women are in the employ of ASC on jobs ranging from teletype operators to electroplaters, from storekeepers to electricians, from photographers to crane operators. They have stepped into thousands of jobs formerly held by men now serving the armed forces overseas.

Although it was feared at first that male students might not accept shopwork instruction from women instructors, the women solved this problem themselves by proving complete mastery of their respective jobs.

The first woman trainee in propeller work at one of our depots was the chief instructor's wife. So quickly did she learn that she was added to the teaching staff and, after her husband died a few months later, succeeded him as head instructor.

Without a pool of aircraft mechanics to draw upon, faced by the high labor turnover common in the aircraft industry (75 percent) and confronted by shortage of manpower in all areas, we began hiring blind and crippled workers on an experimental basis. When they proved they could perform duties capably in certain occupations, more were hired for placement according to their abilities. Four blind workers at one depot proved able to pack bolts and nuts as fast as eleven normal workers.

Special recruiting caravans helped us through one critical labor-shortage season by enlisting the services of an extra 1,000 employees.

Despite the rapid increase of workers with middle-aged men and women tackling jobs entirely new to them, with the blind and crippled replacing able-bodied workers, the incidence of accidents was reduced forty percent and accident severity seventy percent. The saving to ASC through "accidents that didn't happen" was 3,544,000 man hours of work. For this record, ASC was awarded the nation's highest safety honor for 1943, the "Distinguished Service to Safety" citation of the National Safety Council.

Our task of keeping the planes of the AAF flying has been accomplished. We have trained personnel to be versatile repairmen capable of repairing and maintaining equipment manufactured by all aircraft and accessory companies. Our men have been responsible for engineering and producing many original modifications while turning out rush jobs and expediting supplies for overseas squadrons that are completely dependent upon the work of the folks back home, our civilian AAF. ☆



An old hand at precision repair work shows a trainee the proper way to perform a delicate operation during mechanical instruments class at the Miami Air Depot. He advises a gentle touch with that hammer.



Besides working at the mechanical trades, for which they show marked aptitude, many of the 90,000 women employed by the ASC are engaged in office pursuits. Workers seen above are checking a stock record.



A Report on Army Air Forces Training Devices

The training film is a camera record of test jumps made by three officers into the Atlantic Ocean off the coast of Florida on February 3 and 4, 1944. Two jumps each were made by Lieut. Col. E. V. Stewart, chief of the parachute unit, Materiel Command; Lieut. Col. M. W. Boynton, chief of the medical safety division, OFS, and Lieut. Col. W. M. Angus, chief of the safety education division, OFS. The first jumper was a veteran of 436 jumps, but he was a non-swimmer. The second had seven static line jumps to his credit, was a swimmer, but he had never jumped into water. The third jumper was a swimmer, but he had never jumped before.

Each officer wore a pneumatic life vest, a standard B-8 back-pack parachute with three-point snap release and standard ripcord, a one-man seat-pack life raft tied or snapped to his chute harness and a reserve chest-pack parachute.

Procurement number for "Parachuting into Water" is TF 1-3665.

► Devices Catalog

A new Training Devices Catalog, completely indexed and containing all necessary data on standard training devices, has been distributed to appropriate AAF activities. This catalog supersedes the previously published Synthetic Devices Catalog.

Bound in loose-leaf form to permit

deletions and additions as developments demand, the catalog is composed of four main sections covering more than 160 different subject-classified devices. It emphasizes standardization of nomenclature, provides a time-saving ready reference and index guide and includes a chart showing the application of the various training devices described.

General information is offered on how to obtain devices, who provides for housing and operating and maintenance personnel, and the procedure for developing and standardizing new devices.

Descriptions and illustrations are provided for each major commercially manufactured device currently procurable and in use, with individually tabulated data

► Overwater Jumps

Correct technique for parachute jumps into water is the subject of a new training film being released by Training Aids Division. The motion picture, produced by Materiel Command and the Office of Flying Safety, is composed of film shot during the actual test jumps into the Atlantic Ocean.

Recommended as a "must" for all aircrews, the film takes you from the escape hatch of a B-24, through all the necessary actions until you are safely tucked away in a one-man life raft.

"Parachuting into Water" disproves one fallacy and establishes the value of several procedures the jumper must follow if he is to stay out of trouble. The fallacy, that of letting go of the harness just before striking the water, was voted incorrect when jumpers found it almost impossible to judge distance over the water accurately. If you let go of the harness too soon, there is great danger of falling into the water from a distance too great to survive the shock of impact.

Procedures recommended for overwater jumps are:

- (1) Throw away all equipment that you won't need.
- (2) Follow instructions in the Pilot's Information File.
- (3) Keep your legs straight and feet together when you pull the ripcord.
- (4) Settle back in the sling.
- (5) Undo chest strap so you'll be able to inflate your Mae West.

- (6) Undo leg straps if you are securely seated in the sling and have time.
- (7) Ride chute harness into the water and inflate Mae West. Leg straps can be undone or slipped over the legs in the water if necessary at this time.
- (8) If you do not have a raft, get away from the parachute and stay away.
- (9) If you have a raft, work upwind away from the canopy to avoid tangling in the lines. For the same reason, keep the life raft between you and the floating chute while inflating the raft. Salvage parachute for sail, cover and extra lines.
- (10) Carry a serviceable knife where you can find it. It will help if you become tangled in the lines.

These photographs taken from the training film show (Frame 1) the jumper after he has unfastened his chest strap and as he attempts to unfasten his leg straps. In Frame 2, he has inflated his Mae West on striking the water and is working upwind away from the floating chute. The life raft has been inflated between the jumper and his chute in Frame 3. After climbing into his raft (Frame 4), the jumper is hauling in the chute for later use.



on official availability, power, maintenance and personnel requirements, shipping data, property class, stock number, technical order, specification and the like.

There is a listing of more than 100 locally constructed devices—trainers, cut-aways and mock-ups—arranged according to subject material with information available to the field listed directly with each device.

► AAF Organization Film Strips

Three film strips have been made available to supplement Training Film 21-1236, "Organization of the Army," which did not contain a description of the organization of the Army Air Forces. They are FS 1-748, "Organization of the AAF-Part I, Headquarters Section"; FS 1-749, "Organization of the AAF-Part II, The Commands," and FS 1-750, "Organization of the AAF-Part III, The Air Forces."

► Proper Use of Training Films

Experimental studies conducted by both military and civilian agencies indicate that men's knowledge of subject matter presented in a film is materially increased by supplementing the film with an introductory explanation or a follow-up quiz.

Air Forces Manual No. 13, "How to Use Training Films," has been designed to provide the instructor with a summary of principles which lead to effective training film utilization. Photos and drawings in the booklet assist in visualizing the basic points described.

► AFTAD Regulation Revised

The revised AAF Regulation 50-19, "Training—Training Aids," published under date of 27 May 1944, defines ex-

actly what are and what are not training aids. It circumscribes the limits of responsibility of all headquarters and other AAF agencies as they affect training aids from the development stage to the use of the completed aid. The revised regulation is recommended for careful study by training aids officers and others in the AAF concerned with training aids.

► Marking Film Cans

At the suggestion of film library officers, all confidential and secret training films delivered on initial distribution henceforth will have the metal can marked in red to assist in identifying such classified subjects. The cans for confidential and secret films will have a red stripe around the rim and a red stripe across top and bottom. It is recommended that film librarians go through their present list of films and mark all confidential and secret films in a similar manner.

► Maps on Film Strips

Briefing officers and other personnel interested in solving the problem of bulkiness in maps are referred to a series of five film strips recently released:

FS 1-688 Maps of Mediterranean Sea Area.

FS 1-689 Maps of Southwest Pacific Area.

FS 1-690 Maps of Northwest Pacific Area.

FS 1-691 Maps of India, China and Japan.

FS 1-692 Maps of Europe, Scandinavia and Russia.

Each of these film strips contains a master index map providing an adequate key to the 50 to 75 detailed section maps.

Used with any standard film strip projector, the maps can be thrown on a screen for detailed study by a group, thereby affording all the advantages of wall size maps and at the same time overcoming all the disadvantages of bulk and weight which are encountered with wall maps.

► AFTAD's Publication

The AFTAD Bulletin, approved technical publication of the Training Aids Division, is published for the purpose of directing all pertinent information regarding training aids into the channels where the information will be put to best use.

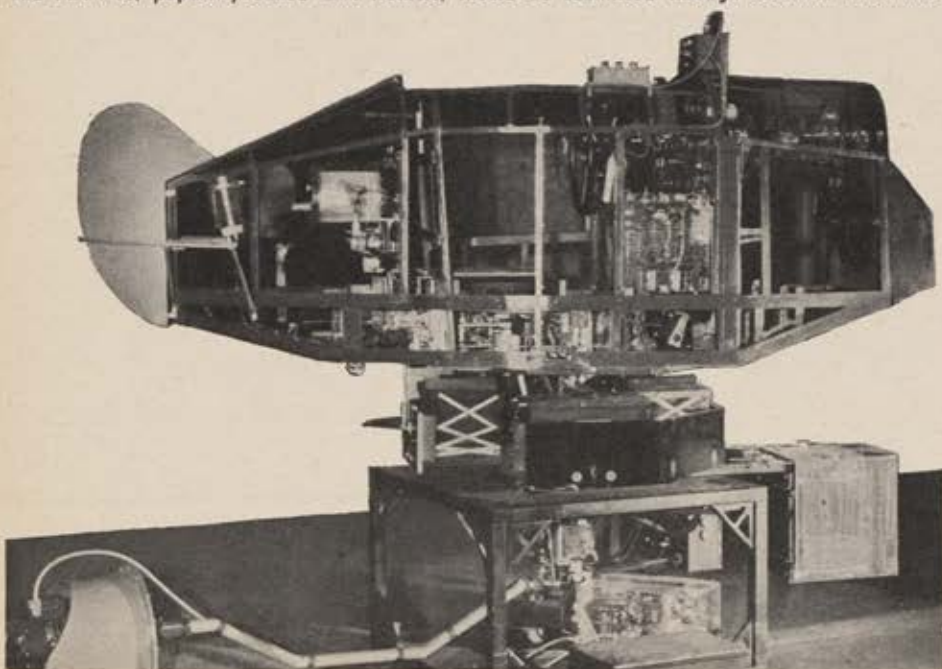
The different sections of the Bulletin present such information as general training aids policies, correct procedure and channels for obtaining various training aids, listings of training aids officers, suggested training aids programs, uses of training aids, status of projects in preparation and approximate dates of release, new developments, evaluations of standardized training aids, ideas from the field on suggested uses of training aids, station allocations, shipments of devices from manufacturer or stock to AAF activities, notices of training aids available for exchange, delivery status of devices, reviews of new films and new publications, and information from other commands and air forces and the Navy which is of value to training aids officers.

The "Local Construction" section of the Bulletin is the medium for dissemination of complete data and plans for training aids which are not on standard procurement but which have been found useful at some AAF base. Construction of these aids can be accomplished at any base from printed photographs, drawings and accompanying descriptions in the Bulletin. This section also serves as a medium of exchange of ideas from the field on the uses and modifications of standard training aids.

AAF personnel are invited to contribute articles and photographs of interest to training aids activities. This Bulletin is distributed to headquarters of all activities concerned with training aids. Requests for copies should be addressed to your headquarters. ☆



This AN-T-18 trainer was modified at the department of teletype and Link trainer, Chanute Field, Ill., by inclosing the fuselage and mechanism with plexiglas and plexofilm for instructional purposes. Requests for all types of instrument flying and landing trainers such as the C-3, C-5 and AN-T-18, popularly called Link trainers, should be submitted through channels to AFTAD.

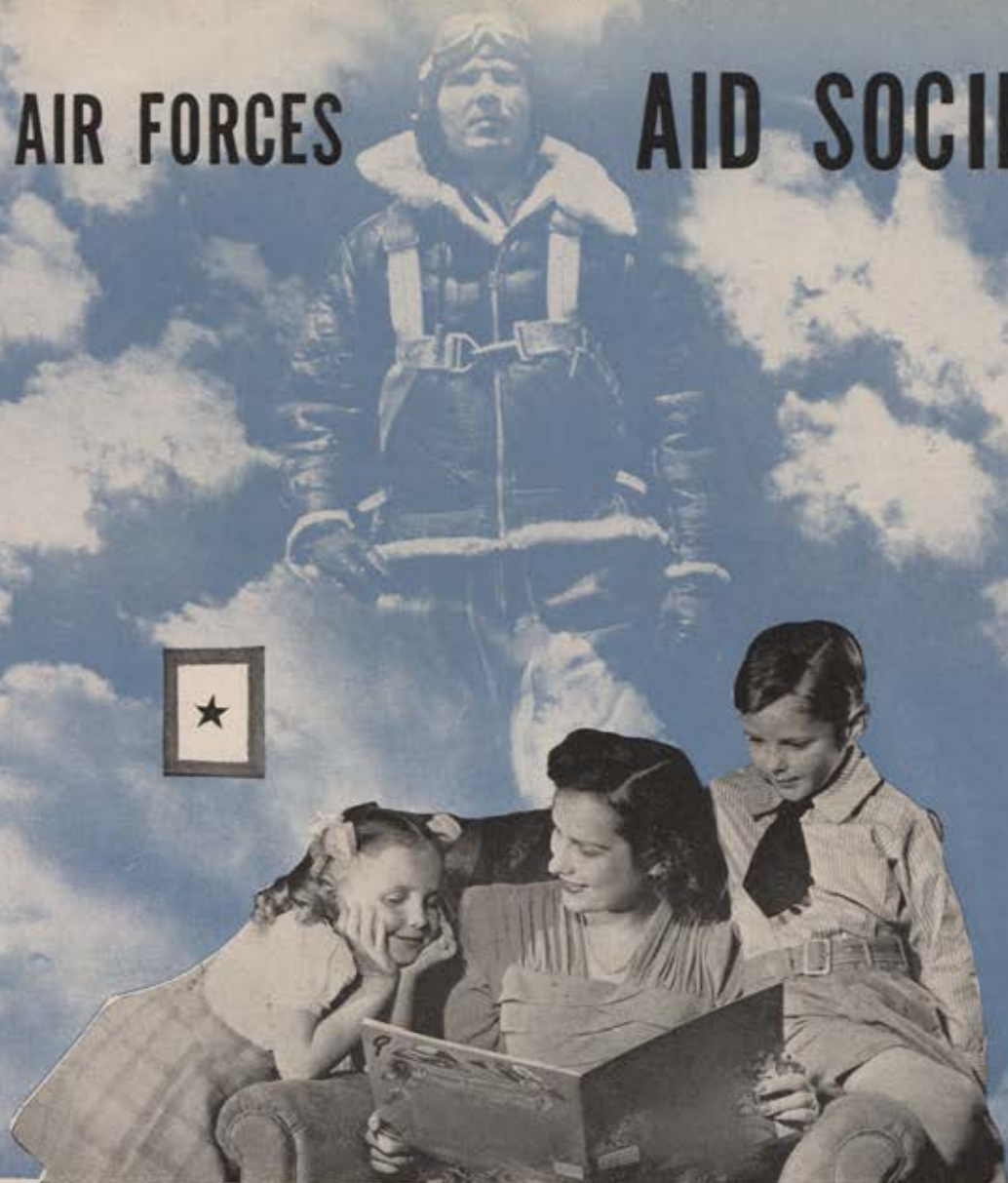


WHERE TO GO

Information on the availability of training films and film strips, 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.

ARMY AIR FORCES

AID SOCIETY



By Capt. Benjamin J. Grant
AIR FORCE Staff

SOMETHING was up, something big. The urgent note in the Commanding General's voice made that clear.

Addressing a group of officers and their wives on the beach at Nags Head, N. C., he said, "I want you to get our own Air Corps relief organization started—now."

They knew what he meant—a society to provide for the dependents of men killed or injured while serving with the Army Air Forces. It had been a pet idea of the Arnolds and other Air Corps old timers. Now the time for it had come. Nobody asked why all the rush. Questions didn't seem in order just then.

It was August, 1941. The president had declared a national emergency. The Army, including the Army Air Forces, had been swollen by Selective Service inductees, volunteers, National Guard troops and Reserves. The country was getting ready for bad news.

Today, it can be told why General Arnold spoke with such urgency. AAF groups were being ordered out to take over a system of defensive offshore bases. Men who a few weeks earlier had been bankers and salesmen and clerks were flying off to strange lands. They were to leave almost without warning. Anything could happen. There would be serious dislocations at home. There would be distress cases.

General Arnold knew that distress at home means bad morale in the Army.

This concern over dependents was an old story among Army air officers. For years, it had been extracurricular problem Number 1 at many an Air Corps station. By the very nature of their business, Air Corps personnel lived hazardous lives. As someone used to put it, "By comparison with the rest of the Army, the Air Corps has a wartime casualty rate when

the country is at peace." The Air Corps expansion of the 1930s, accomplished principally by calling reserve officers to extended active duty, complicated the problem. Nine out of ten flying men in the Air Corps were ineligible for help from the Army Relief Society, whose charter prohibited benefits to any except dependents of deceased *Regular Army* personnel. Local post funds, established unofficially at many AAF stations, were inadequate and results were hit-or-miss.

In those days, General Arnold (Colonel Arnold then) was commanding officer at March Field, Calif. Conversations with many senior officers of the Air Corps led him and Mrs. Arnold to the conviction that a national society, set up with Air Corps problems in mind, would be the only satisfactory solution. Some day, there would be such a society. They would see to it. And they did.

Minds met at Nags Head that weekend in August, 1941, on the broad policies and aims of the society. By Monday letters had been written to interested persons all over the country. Details requiring attention were listed and catalogued.

By December 8, 1941, when war was declared, many meetings had been held in Washington and the handful of founders had their plans well in mind. War was bound to affect those plans. For the duration, many of the AAF problems would be shared by other branches of the service, and Army Emergency Relief was set up to provide for distress cases throughout the Army as long as the war should last. To avoid duplication, the AAF group agreed that their society would be inactive as a relief organization but would accept unsolicited bequests, legacies and gifts to be added to its fund for use after the war. With the return of peace, the AAF organization would inherit a big assistance job.

Accordingly, in March, 1942, the Army Air Forces Aid Society was incorporated in the District of Columbia "to collect and hold funds and to relieve distress of personnel of the Army Air Forces and their dependents, including dependents of honorably retired or discharged and deceased personnel thereof, to provide for their education, and to secure employment for honorably retired or discharged personnel and their dependents and the dependents of deceased personnel."

WHAT all that legal language boils down to is that the Army Air Forces, through a voluntary association of its members and friends, proposes to offer a helping hand to the wives and children of those members of the AAF family, both officers and enlisted men, who don't get back. It proposes to aid those who are injured while serving with the AAF. It proposes to see that education is provided for the children of men killed or incapacitated while serving with the AAF.

In short, so far as funds and conditions permit, it will be the business of the society to make good a motto of the Commanding General, "The Army Air Forces takes care of its own." And this means more than financial aid; it means assistance on personal problems, advice, services of many kinds.

The Army Air Forces Aid Society is not an emergency proposition but an organization which, conceived during peace, will continue as a permanent establishment after the war. As the AAF had peculiar assistance problems long before its first plane was shot down in this war, so the AAF will have peculiar assistance problems in the years following the war. Logically then, when the wartime relief organizations are inactivated, the Army Air Forces Aid Society goes into action.

Today, it is getting ready for the job ahead. With volunteer help, the society is keeping books on a fast-growing mem-

Through this volunteer relief organization, the AAF plans to assist in solving the post-war problems of its personnel.

bership. Every mail brings membership applications—hundreds of them, although the society has been as good as its promise that as long as the war lasts there will be no drive for members or for contributions. But such voluntary contributions as are made, the society is authorized to accept and hold for the day when its benefits are offered to qualified persons.

THE public response to this unadvertised society has been remarkable. Today, it has upwards of 100,000 members. Contributions have ranged from school boys' quarters to five-figure gifts from more affluent friends of the AAF.

There are stories galore in these contributions. One popular general officer's autograph is being sold at a dollar apiece by his secretary, the proceeds going to the Aid Society. An irate citizen, letting off steam after reading of Jap atrocities, sent Lieut. Gen. James H. Doolittle a \$10,000 treasury note and told him in an accompanying letter to "light yourself a cigar or cigarette with the enclosed"; General Doolittle passed it on to the Aid Society, which got it exchanged for a depositable check. A fifteen-year-old girl celebrated



her first pay day by sending in \$1.50 and promised at least that much every Saturday. The society received \$375 from 30 American-born Chinese workmen at Pearl Harbor, who said the gift was made in appreciation of the first bombing of Tokyo. Several officers clubs at AAF stations have made substantial gifts.

Hundreds of persons and organizations, wishing to honor the memory of an AAF relative or friend in some more substantial way than by sending the customary flowers to the family, have contributed to the Aid Society's memorial division. No matter how small the contribution, the name of the individual so honored is entered on the Memorial Roll of the society, and the family is notified by card that a sum has been donated in the name of the deceased person; the card gives the name of the donor but not the amount of the gift. The money collected in this way goes into the regular fund, not earmarked for any particular purpose.

From AAF men in North Africa, the society received a gift of \$413.84 as a

"memorial to those gallant officers and enlisted men" who died in the bombing of the Ploesti oil fields. A Kansas mother sent \$100 as a Christmas gift in memory of her son who was killed in action with the AAF. A group of merchants gave \$307 in memory of a home town boy who lost his life on an AAF mission. Students of a South Dakota high school took up a collection of \$9.45 in honor of a deceased alumnus. A business firm contributed in memory of a mother who had two sons in the AAF.

Not all the gifts are in cash. A woman donated a set of original letters written by Lincoln, Stanton and Grant, authorizing the society to sell them if it wished. The manuscripts and rights of numerous books, songs and articles have been given to the society.

Now to answer some questions:

Who are the officers of the society? President, Robert A. Lovett, Assistant Secretary of War for Air; Vice President, Mrs. Henry H. Arnold; Treasurer, Robert V. Fleming, Washington banker; Secretary, Maj. Gen. J. M. Bevans, Assistant Chief of Air Staff, Personnel; Comptroller, Brig. Gen. L. W. Miller, Air Budget and Fiscal Officer. Board of Trustees: General Arnold, Mrs. Arnold, General Bevans, Representative John M. Costello, Mrs. Howard C. Davidson, Mrs. James H. Doolittle, Mr. Fleming, Lieut. Gen. Barney M. Giles, Mr. Lovett, Maj. Gen. B. E. Meyers, Floyd B. Odum, Capt. Eddie Rickenbacker, Brig. Gen. C. R. Smith, Thomas J. Watson and Charles E. Wilson.

Will there be any distinction between officers and enlisted men in the right to receive benefits? No.

What does membership in the society have to do with the right to receive benefits? Nothing at all. Benefits of the society will be administered without regard to membership.

What are the advantages of membership? The right to vote at meetings and the personal satisfaction of having contributed to a good cause.

Who is eligible for membership? Anyone, military or civilian, who wants to support a good cause.

Are donations to the society deductible for income and estate tax purposes? Yes.

What are the membership classes and dues? Patron members, \$100 membership fee, no annual dues; life members, \$50 membership fee, no annual dues; benefactor members, \$5 a year; members at large, \$1 a year.

What is the address of the society? Washington, 6, D. C.

As vice president, Mrs. Arnold is the active head of the organization. With no compensation except the satisfaction of making a happy dream come true, she and many other AAF wives are devoting themselves to the ideal that the AAF must, in fact, take care of its own. ☆



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

TCC MECHS RECONSTRUCT GERMAN GOTHA 242 GLIDER . . .

A large German Gotha 242 glider—reconstructed from piles of wrecked aircraft on an airfield in Italy by Troop Carrier Command glider mechanics who had never seen a Nazi motorless aircraft—is now in the hands of U. S. aircraft research experts.

The glider, similar to the type used in the German air invasion of Crete, was built on a captured airfield by a small group of mechs who worked with strange equipment, improvised tools, no technical information and no previous experience in constructing gliders.

When Allied forces captured an airfield near Naples, a pile of wrecked Gotha gliders, demolished by the Germans in their hasty evacuation of the area, was found. Military authorities wanted a complete "German glider." The job was one to be done by an air force depot unit. But none was available. So they gave First Lieut. Nicholas F. Miller, now com-

manding officer of a 9th Troop Carrier Command glider echelon in England, the task with the assistance of twelve glider mechanics.

No technical information concerning the aircraft was available. But Lieutenant Miller and his men had experience in repairing AAF CG-4A gliders and the American "know-how." So they went to work.

Out of the rubble of broken fuselages, wings and rudders riddled by shrapnel, and myriad minute parts damaged almost beyond recognition by the fleeing Jerries, a flyable Gotha took shape. Mechanics often entered mined areas to procure essential parts from debris of shattered aircraft strewn about the field. The tires came from a wrecked English bomber. The dope used for sealing fabric construction was from captured Italian stores from another airfield. Tape and other minor necessities were made from raw materials. New tools were improvised for strange bolts, nuts and screws.

Standing by the German Gotha 242 glider are the TCC men who reconstructed and assembled it from wreckage piles of several such aircraft left demolished on an airfield in Italy by hastily-evacuating Germans. The reconstruction job, done under combat conditions without benefit of depot facilities, was for the sake of military research and experimentation. The Nazi glider, a high wing, twin-boom monoplane, has been dubbed "Fabric Fortress" by its recreators: front row (left to right) Sgt. Carlin Hattan, Sgt. Clifford R. Kuborn, First Lieut. Nicholas F. Miller, Sgt. Paul C. Thompson, Cpl. Vance D. Bolin and Pfc. Vincent J. Lukason; back row, Pfc. George H. Koebbe, Staff Sgt. Clarence E. Garner, Staff Sgt. Porter L. Morgan, Pfc. Leonard R. Cain, Sgt. Allyn D. Clark and Pvt. Seymour Markowitz. Not in the picture is Sgt. Francis L. Nash.



One of the most difficult parts of the glider to reconstruct was its twin-tail section. Some inevitable souvenir-seeking GI had cut out the tail swastikas.

The work was divided among the mechanics according to their special abilities. The fuselage was completely rebuilt by Staff Sgt. Clarence E. Garner, Meriam, Kan.; Staff Sgt. Porter L. Morgan, Brownfield, Texas, and Sgt. Francis L. Nash of Willcox, Ariz.

Pvt. Seymour Markowitz, Brooklyn, N. Y., handled most of the fabric work while Pfc. George H. Koebbe, Jackson, Mich., repaired the glider's twin booms, filling up shrapnel holes in the plywood.

Sgt. Carlin Hattan, Parsons, Kan., installed the windows and cockpit while doors and other woodwork were done by Sgt. Clifford R. Kuborn, Artesian, S. D., and Sgt. Allyn D. Clark, Wisconsin Rapids, Wis.

The tail section and minor repair jobs through the aircraft were taken care of by Sgt. Paul C. Thompson, Los Angeles; Cpl. Vance D. Bolin, Tulsa, Okla.; Pfc. Leonard R. Cain, Dodson, Texas, and Pfc. Vincent J. Lukason, Worcester, Mass.

Working long days under constant threat of enemy air attacks and standing guard on the aircraft at night, the men finished their job in five weeks. The result was a flyable glider—identical in every respect to the original flown by the Nazis.

The aircraft itself, known to the AAF men who built it as the "Fabric Fortress," is designed to carry two pilots and 21 soldiers or a maximum freight load of 5,300 pounds.—PRO, Hq, 9th Air Force.

CUTS TIME FOR ELECTRICAL CHECK . . .

An electrical mock-up containing all the necessary switches, wiring and electrical instruments necessary for checking the electrical system of a C-87 airplane engine on its mount prior to installation has been developed at an Air Transport Command base in England by Master Sgt. Herbert H. Van Bibber, Bensonville, Ill., veteran line chief with 22 years' AAF experience.

Effecting a saving of ten man hours on the installation (or forty hours altogether) the device has increased greatly the effective use of the ATC C-87s on the England-Africa shuttle run, according to engineering officers at the base.

Formerly, to test the electrical system

WHAT'S WRONG WITH THIS PICTURE?



DOWN under the B-24 nacelle, a B-2 turbosupercharger takes the spotlight for the ON THE LINE camera for the August session of finding the boners. A "Just so long as the thing operates" attitude during installation or servicing means tough going for the turbo. The proper hookup of all parts is essential to effective engine powering in flight, according to AN 03-10DA-1, which is not the case in this

picture, purposely posed the wrong way in the interest of better maintenance practices.

The two mechs who appear in the picture are Cpl. Dwight Brooks (left) and Pfc. Robert Magenheimer, both of the 4100th Base Unit, Section B, Patterson Field, Ohio. Corporal Brooks can point out seven mistakes in the picture, which are listed on Page 63. Can you find any more?

on C-87 engines following an engine change, the engine had to be mounted on the plane itself and checked through the instruments on the plane's cockpit.

The mock-up is powered by an ordinary 24-volt aircraft battery and is equipped with an inverter to change the 24-volt DC into 115-volt and 45-volt AC. In making the tests all engine instruments such as oil pressure, manifold pressure, tachometer and fuel pressure gauges are tested on the 45-volt current off the inverter.

The plane's regular 24-volt DC is used to test the systems which govern the cowl flap motors, propeller governor, starter, intercooler shutters, priming solenoid, oil temperature, carburetor air temperature and fast feathering solenoid.

Included in the device is a main junction

box fitted with relays and fuses so that if a short circuit is present in the engine wiring system, it blows a single fuse and doesn't wreck the entire system, at the same time also enabling the mechanic to trace the source of trouble without delay.

The whole affair is mounted on a 24" by 24" wooden table and was constructed by Sergeant Van Bibber out of materials salvaged from wrecked aircraft.

In addition, the device can be used on engines already mounted. It is adapted for this purpose by employing a transmitter—the same as mounted on the engine itself but with an additional dial—with a pointer calibrated for the various instruments to be tested. By using the transmitter on the mock-up for his test purposes the mechanic can determine whether it is the instrument or the engine

transmitter that is out of order.—Staff Sgt. James Winchester, Air Transport Command.

RED TAPE HAS CERTAIN MERITS . . .

Supply Division, Air Service Command, comes forward to state the case for red tape (that gremlin of every GI) with facts that only proper channeling of requisitions and the careful usage of right nomenclature for right parts will deliver the goods—and on time.

Requisition confusion stems from failure at AAF base supply depot to inaugurate and keep up-to-date a stock control system and stock balance and consumption reports. Without accurate base depot count of the stations it supplies, surpluses and famines will exist in the same command. (Continued on Next Page)



ON THE LINE (Continued)

Only correct nomenclature should be used for requisitioning parts! Mechs are prone to use homemade or general descriptions. Trade names or standard nomenclature are acceptable, *provided* complete stock number is added.

Maximum stock levels are carefully gauged and when replenishing items are needed to bring stocks up to par only those items needed should be ordered, *not* extras.

The practice of ordering a few extra just for good measure may create shortages in areas where parts are needed critically.

Stock record cards should be checked in compliance with TO 00-35A-6. Screen all reparable items and eliminate items beyond economical repair or those known to be excessive in the theatre. The job of keeping parts moving to places most in need requires unceasing cooperation.

Stock controls make possible monthly or semi-monthly ordering and eliminate more frequent orders which are wasteful. Handling, shipping space, containers and transit procedures are conserved; desk and paper work are cut down.

Expendable items are obtained more expeditiously by use of AAF form 81 *with correct stock number*. Accuracy avoids delays! Activities, apt to give items incomplete and improper identification, garble the supply network. For best results use stock lists, TOs and illustrated parts catalogs in conjunction with form 81.

DESIGNS PORTABLE PARACHUTE BIN...

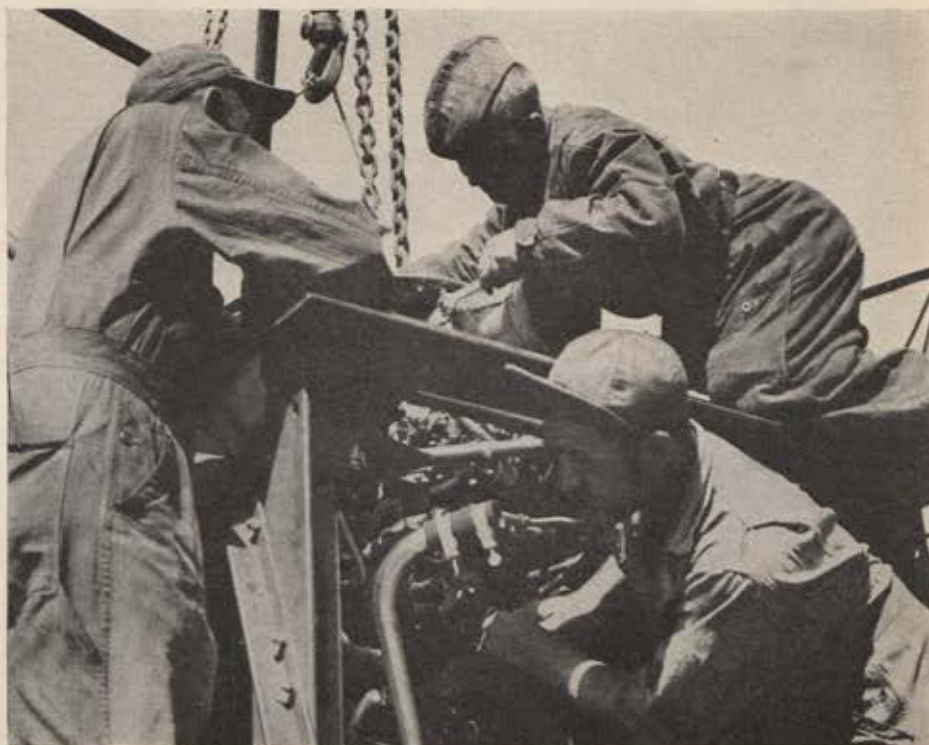
For squadrons constantly on the move which operate their own parachute departments, a portable and collapsible parachute bin has been designed and built by Master Sgt. Willard W. Young, Petuluma, Calif., non-commissioned officer in charge of the parachute department of the "White Knights" fighter squadron of the 13th Air Force Fighter Command in the South Pacific.

Weighing 75 pounds, this parachute bin when set up is eight feet long, five feet high and sixteen inches wide, and will hold twelve parachutes with equipment such as life raft and jungle kit. Each parachute compartment is two feet in length, twenty inches high and sixteen inches deep.

The bin is made of three-ply plywood with two-by-four-inch base and main supports and one-eighth-inch cable cross-bracing at the back of the bin, turn-buckled taut. ☆



As the advancing movement of the war against the Germans makes new bases available mechs of the AAF go right along doing the same work—only the surroundings and pitch of intensity changing with combat conditions. Above, somewhere in France, (left to right) Staff Sgt. Edmund Fernholts, Arcadia, Wis.; Staff Sgt. Alfred Zigler, Kansas City, Mo., and Cpl. Arnold Blakeslee, Los Angeles, repair a bullet-torn fuel line. Below, at one of the USSR airfields used by the AAF, (left to right) Master Sgt. John M. Bassett, Silver Springs, Md., Lenin Boykov, Leningrad, and Master Sgt. Michael Cajolda, Philadelphia, all skilled aircraft mechanics, repair a B-17 engine. This trio is one of several of the combined Soviet-American ground crews.



Carlson, David E., Sgt.
Carlson, Edwin L., S/Sgt.
Carlson, Ellis E., S/Sgt.
Carlson, John R., S/Sgt.
Carlson, Maurice W., S/Sgt.
Carlson, Robert W., Lt.
Carlson, Walter J., T/Sgt.
Carlstrom, Joseph L., S/Sgt.
Carlton, Clyde W., S/Sgt.
(& OLC)

Roll of Honor

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

(Continued from Page 47)

Carnes, Benjamin F., T/Sgt.
Carney, Arthur, S/Sgt.
Carney, Thomas J., Pfc.
Carroll, Wayne L., Lt.
Carpenter, Darwin K., Lt.
Carpenter, David E., Capt.
Carpenter, Frederick S., T/Sgt.
Carpenter, George, Capt.
Carpenter, Glenn S., T/Sgt.
Carpenter, Hervey B., Capt.
Carpenter, Kenneth D., S/Sgt.
Carpenter, Leslie M., Jr., F/O
Carr, Benton V., Lt.
Carr, Byron L., S/Sgt.
Carr, David E., S/Sgt.
Carrier, Robert A., S/Sgt.
Carroll, D. M., T/Sgt.
Carroll, Delwin E., T/Sgt.
Carroll, James J., Lt.
Carroll, John W., Capt.
Carroll, Rayburn, Sgt. (& OLC)
Carter, Roger, Capt.
Carter, William H., Lt.
Cartmill, Reece D., T/Sgt.
Cartwright, Anthony L., S/Sgt.
Cartwright, Harrison W., T/Sgt.
Carver, William, S/Sgt.
Case, James H., S/Sgt.
Case, Robert E., Lt.
Case, Spencer F., Lt.
Casey, James F., Lt.
Casey, John R., Jr., Lt.
Casey, Leroy V., Capt.
Casey, Louis S., Lt.
Casey, Martin D., S/Sgt.
Casey, Robert N., S/Sgt.
Caslin, Harold E., Capt.
Casselbury, Clifford, S/Sgt.
Cassidy, William P., Lt. (& OLC)
Castell, Carroll W., Lt.
Castell, Robert H., Lt.
Caston, Edward J., S/Sgt.
Castro, Joaquin, Lt.
Cathcart, Charles O., Lt.
Cattlin, Richard L., F/O
Caton, Carroll D., S/Sgt.
Cator, William E., Sgt.
Caulfield, Lloyd F., T/Sgt.
Caulfield, Carl M., Lt.
Caulkin, Roger L., Lt.
Causery, Merle, S/Sgt.
Cavallo, James J., S/Sgt.
Cavanaugh, Timothy J., Lt.
Cavedo, Kermit B., Lt.
Cavett, Norman P., Lt.
Cawley, Richard A., Lt.
Cebulak, Joseph S., T/Sgt.
Cecil, Floyd M., Lt.
Cecil, Thomas J., Lt.
Ceely, David L., S/Sgt.
Celf, Bruno M., S/Sgt.
Cenilia, John P., S/Sgt.
Ceriome, George E., Sgt.
Chacon, Arturo C., S/Sgt.
Chaddock, Robert B., Lt.
Chadwick, Warren J., S/Sgt.
Chaffins, Pedro V., Cpl.
Chamberlain, James B., Lt.
Chamberlain, William V., Lt.
Chamberlain, William L., Grand Capt.
Chambers, Harry K., S/Sgt.
Champion, Fred, S/Sgt.
Chance, Lyttleton E., Sgt.
Chandler, Berry, Lt.
Chandler, James A., Lt.
Chandler, Paul W., Jr., Sgt.
Chandler, Francis C., II, Lt.
Channell, John S., Sgt.
Chapman, Ernest A., Sgt.
Chapman, James A., Cpl.
Chapman, William T., Jr., Lt.
Chapman, Wilson M., Lt.
Charleston, Wilbur R., S/Sgt.
Charlet, Edward J., T/Sgt.
Charnell, John F., Lt.
Chart, Robert D., Capt.
Chatterley, Robert W., Lt.
Cheaney, Philip N., Lt.
Chely, Joseph E., Lt.
Cheney, Guy P., S/Sgt.
Chenoweth, Stuart C., Lt.
Cherezian, Herant G., T/Sgt.
Cherez, Charles E., T/Sgt.
Chiczum, Russell, S/Sgt.
Chiarello, Frank J., S/Sgt.
Chilcott, Robert M., Lt.
Child, Edward S., Lt.
Chiles, Seaborn H., Lt.
Chilton, Edward G., S/Sgt.
Chima, Cornelius J., Capt.
Chisholm, Hamilton C., Lt.
Chisholm, Henry V., Capt.
(& OLC)
Chiverton, Byron J., T/Sgt.
(& OLC)
Chmelik, Theodore F., Lt.
Choe, Hudson, S/Sgt.
Chovanec, Henry L., Lt.
Chrbers, George E., F/O
Chrisco, William C., Cpl.
(& 3 OLC)
Christen, Arthur P., T/Sgt.
Christensen, Borden W., T/Sgt.
Christensen, Cyril M., T/Sgt.
Christensen, Fred J., Jr., Lt.
Christian, Clyde A., T/Sgt.
Christian, James W., Lt.
Christian, Shannon, Maj.
Christian, Vesper S., S/Sgt.
Christiansen, Carl M., S/Sgt.
(& OLC)
Christiansen, Kenneth P., Lt.
Christianson, Carl A., T/Sgt.
Christie, George M., Sgt.
Christie, Homer R., S/Sgt.
Christofferson, Lester O., S/Sgt.
(& 2 OLC)
Chudars, Stephen M., S/Sgt.

Church, Warren E., Lt.
Churchill, Norman V., F/O
Cieri, Anthony J., Capt.
Cihak, Erwin F., Lt.
Cimaglia, John D., Capt.
Cinquegrana, Vincent E., Jr., Pvt.
Clamp, Charles G., Jr., Lt.
Clancy, William L., Lt.
Clark, Charles D., Lt.
Clark, Charles D., Capt.
Clark, Charles R., S/Sgt.
Clark, Clarence W., S/Sgt.
Clark, Dudley R., Lt.
Clark, Earnest B., S/Sgt.
Clark, Elmo E., F/O
Clark, Frank M., Lt.
Clark, James, S/Sgt.
Clark, Ivan, Jr., S/Sgt.
Clark, Joseph H., S/Sgt.
Clark, Lawrence D., Lt.
Clark, Leonard J., Sgt.
Clark, Milton L., Lt.
Clark, Paul W., Pvt.
Clark, Walter H., S/Sgt.
Clark, William, F/O
Clark, William G., Lt.
Clark, William J., Sgt.
Clarke, Robert J., Lt.
Clarkson, George, Sgt.
Claffetter, Paul L., T/Sgt.
Clay, Martin D., Jr., Sgt.
Clayton, Clay D., Jr., S/Sgt.
(& OLC)
Clayton, Lewis F., S/Sgt.
Cleveland, Alton B., Jr., S/Sgt.
Cleveland, Gordon E., Lt.
Clemens, Michael L., Lt.
Clement, Richard W., Lt.
Clements, Albert W., Lt.
Clements, Richard E., Lt.
Clements, Stanley C., S/Sgt.
Clemenzi, Edmond J., Lt.
Cledensens, William F., S/Sgt.
Cliff, Robert E., T/Sgt.
Clifford, George A., S/Sgt.
Cliff, Oscar Q., Jr., Lt.
Clifton, David S., Capt.
Clifton, James, Lt.
Clifton, John W., T/Sgt.
Cline, Thomas H., Capt.
Cline, William J., Lt.
Clingman, William P., S/Sgt.
Clonch, Thomas M., S/Sgt.
Clonkey, Clifford R., S/Sgt.
(& OLC)
Closs, Drexel H., T/Sgt.
Closs, Vivian A., Capt.
(& 2 OLC)
Clymer, Harvey C., Lt.
Coombs, Joseph B., Lt.
Coard, John N., Sgt.
Coats, Richard W., S/Sgt.
Coat, Bradford E., Sgt.
Cobb, Charles L., Lt.
Cobb, Elmer, Capt.
Cobb, James O., Capt.
Cobb, Willard S., M/Sgt.
Cobeaga, Mitchell A., Capt.
Cobey, Bartholomew K., Lt.
Cochran, Donald D., Jr., Lt.
Cochran, William L., S/Sgt.
Cochrane, Alexander M., S/Sgt.
Cockersole, Alex G., Lt. (& OLC)
Code, George W., Lt.
Coffey, Noel F., Lt.
Coffman, Dennis E., S/Sgt.
Coffman, Robert F., Sgt.
Coghlan, John N., Lt.
Cogswell, Robert W., Lt.
(& OLC)
Cohen, Max, S/Sgt.
Cohen, Stanley, Lt.
Collie, Henry G., Jr., F/O
Colasunono, Joseph J., Lt.
Colby, Frankie H., S/Sgt.
Colby, Lyle G., T/Sgt.
Colchagoff, George D., Lt.
Coldiron, Owen J., S/Sgt.
Cole, Edgar B., Maj.
Cole, Howard L., Sgt.
Cole, Melvin R., S/Sgt.
Cole, Robert F., T/Sgt.
Cole, Willie L., S/Sgt.
Coleman, Francis J., Lt.
(& OLC)
Coleman, Leslie F., T/Sgt.
Coleman, Robert C., S/Sgt.
(& OLC)
Coley, Robert V., Pfc.
Colgrove, Robert E., Lt.
Coll, William F., T/Sgt.
Collard, John E., Lt.
Colleran, Robert J., Maj.
Collette, Joseph E., S/Sgt.
Collette, Robert W., F/O
Colley, Gene C., S/Sgt.
Colley, James B., Lt. (& OLC)
Colley, Matthew C., Lt.
Collie, David T., S/Sgt. (& OLC)
Collins, Ben F., Lt.
Collins, Charles E., Lt.
Collins, Jack M., Lt.
Collins, James H., Lt.
Collins, Robert J., S/Sgt.
Collins, Elwood E., Lt.
Collins, Frank J., Lt.
Collins, Hal H., Jr., T/Sgt.
Collins, Harvie L., S/Sgt.
Collins, Hector J., S/Sgt.
Collins, Hodge J., T/Sgt.
Collins, James W., T/Sgt.
Collins, Richard M., Lt.
Collins, Theron U., Jr., Capt.
Collins, Thomas F., Maj.
Collinsworth, J. D., Lt.
Colony, John W., Lt.

Colton, Francis R., S/Sgt.
Columbus, Thomas B., Lt.
Colvard, William P., Sgt.
Combs, Mack, Sgt.
Combs, Richard A., Lt.
Combs, Stanley, Lt.
Combs, Victor R., T/Sgt.
Comer, Cecil C., Lt.
Cometh, Lawrence, Capt.
Comentofski, Eugene J., Lt.
Compo, Anthony, S/Sgt.
Compton, Keith K., Col. (& OLC)
Compton, Leonard D., T/Sgt.
Comstock, Harold E., Lt.
Condon, William F., Jr., Lt.
Condy, William L., Capt.
Conger, Paul A., Capt.
Conkle, Leonard L., Lt.
Conley, Howard M., T/Sgt.
Conley, David M., Maj.
Conley, Harry M., Capt.
Conley, John E., Lt.
Conley, Joseph J., S/Sgt.
Conley, Robert, S/Sgt.
Conley, Robert J., S/Sgt.
Conrad, John C., Lt.
Conn, Myron R., Capt.
Connally, Edwin W., Sgt.
Connolly, Joseph W., Capt.
Connolly, James K., A/C
Connolly, John E., T/Sgt.
Connelly, Lonny J., S/Sgt.
Connor, Edward D., Jr., S/Sgt.
Connors, Wayne S., Capt.
Conrad, Arthur, Jr., Capt.
Conroy, Neil P., Lt.
Conroy, Paul F., Lt.
Conway, Robert J., F/O
Conway, Robert J., S/Sgt.
Coogan, Jay G., S/Sgt.
Cook, Bobby A., Capt.
Cook, Charles H., Lt.
Cook, Charles R., Lt.
Cook, Clarence A., T/Sgt.
Cook, Claude T., T/Sgt.
Cook, Joseph J., S/Sgt.
Cook, Joseph R., F/O
Cook, Leonard J., Lt.
Cook, Leonidas B., S/Sgt.
Cook, Louis G., Lt.
Cook, Max J., Lt. (& OLC)
Cook, Walter V., Capt.
Cooke, Fred C., Lt.
Cooke, Richard B., S/Sgt.
Cooke, Russell E., Lt.
Cooley, Willis M., Lt.
Coombs, William F., S/Sgt.
Coones, Harry R., Lt.
Cooney, Jacob M., Lt.
Cooney, Robert M., Sgt.
Cooper, Dowd L., F/O
Cooper, Earl J., Maj.
Cooper, Hal R., S/Sgt.
Cooper, Henry A., S/Sgt.
Cooper, Jack, S/Sgt.
Cooper, James L., Lt.
Cooper, James N., Capt.
Cope, William S., Capt.
Coppens, Edward A., S/Sgt.
Corbin, Bernard L., Lt.
Corcoran, John E., Jr., T/Sgt.
Corcoran, Robert E., Lt.
Cordell, Richard N., Lt.
Cords, Warner J., S/Sgt.
Corley, Quinn M., Maj.
Corn, George C., Jr., Sgt.
Cornell, Harold K., Lt.
Corneth, Charles M., Lt.
(& 2 OLC)
Cornwell, Glenn H., T/Sgt.
Cornwell, Amos B., S/Sgt.
Coronios, Harry, Lt.
Corrie, Robert B., Lt.
Corrigan, Robert A., Lt.
Corrigan, Robert E., Lt.
Corvare, Sabbatino, Lt.
Corry, Arthur S., S/Sgt.
Corser, Frank M., S/Sgt.
Corwin, William H., Capt.
Cosart, Darrell R., Lt.
Costello, Robert, Capt.
Costello, George J., S/Sgt.
Cotler, Allan, Lt.
Coulson, John, S/Sgt.
Coulter, Arnold G., T/Sgt.
Coulter, Orville K., T/Sgt.
Coulter, Richard R., Lt.
Counce, James D., S/Sgt.
Courtney, Raphael C., Lt.
Courtright, Earl W., T/Sgt.
Couvillion, Stanley J., S/Sgt.
Covett, Wayne L., M/Sgt.
Covert, Bedford L., Lt.
Cowan, James D., S/Sgt.
Cowan, Leroy W., S/Sgt.
Cowan, Randall, S/Sgt. (& OLC)
Cowan, Wesley D., T/Sgt.
Coward, James S., Lt. Col.
Coward, William S., Jr., Maj.
Cowan, Hiram M., S/Sgt.
Cowler, Robert C., S/Sgt.
Cox, Arthur E., Cpl.
Cox, David C., Lt.
Cox, Don F., Lt.
Cox, James R., F/O
Cox, Robert T., Lt.
Cox, Thomas D., Lt.
Cox, William Y., Jr., S/Sgt.
Coxwell, Jonathan E., Maj.
Coyette, Charles R., S/Sgt.
Coykendall, Ralph A., T/Sgt.
Cozad, Edward G., S/Sgt.
Cozzini, Robert C., Lt.
Craft, Winfred, Capt.
Craig, Dorman S., Capt.

Craig, Horace C., Maj.
Craigs, John E., T/Sgt.
Cramer, Charles O., Capt.
Crandall, Robert A., Capt.
Crandell, John A., Jr., Lt.
Crane, Edwin R., Lt.
Crane, Gordon R., Sgt.
Crane, Joseph F., F/O
Crans, Chester S., T/Sgt.
Craves, Charles W., Lt.
Crawford, James M., S/Sgt.
Crawford, Ray, Lt.
Crawford, William E., Lt.
Creasey, Elmer C., Sgt.
Creelius, William R., F/O
Creel, Linton G., S/Sgt.
Cressey, Mahlon W., S/Sgt.
Cressman, Arthur R., S/Sgt.
Crawick, Bernard C., Sgt.
(& OLC)
Crews, Sidney W., Lt.
Crich, Jack M., Lt.
Crichton, Douglas E., Lt.
Crim, Harry C., Jr., Lt.
Crippen, George O., T/Sgt.
Crisiewicz, Walter C., S/Sgt.
Crist, Danny M., Lt.
Criswell, James B., Lt. (& OLC)
Crivois, Albert, T/Sgt.
Crocker, Charles J., Lt.
Crocker, Emory B., Lt. (& OLC)
Crockett, John A., Lt.
Crookham, Otis S/Sgt.
Cromer, Daniel H., Maj.
Cronin, John J., Lt.
Crooks, James H., Lt.
Crooks, Robert D., Lt.
Cropper, Ernest E., S/Sgt.
Crosley, Donald W., S/Sgt.
Crosby, Luke J., S/Sgt.
Cross, Jack L., Lt.
Cross, Louis D., Lt.
Cross, Willard D., Lt.
Cross, William A., T/Sgt.
Crossett, Jack C., Lt.
Crosley, Donald W., S/Sgt.
Crosley, Harold H., Capt.
Crouch, Wilbur E., Lt.
Crouch, William C., T/Sgt.
Crow, Robert T., Jr., Lt.
Crowder, John P., Jr., Maj.
Crowder, Robert W., S/Sgt.
Crowe, Charles H., Lt.
Crowell, Richard S., Lt.
Crowley, Elmer L., S/Sgt.
(& OLC)
Crownover, Joseph C., Lt.
Crowthy, John K., T/Sgt.
Crutskank, Arthur W., Jr., Capt.
Cruik, Harold E., Lt.
Crutchfield, James F., Lt.
Cruz, Eduardo, S/Sgt.
Crysler, Charles J., Lt.
Culpeper, John P., Jr., S/Sgt.
Culpeper, William R., S/Sgt.
Culper, Theodore T., S/Sgt.
Culbert, Clinton P., Lt.
Culbertson, Norman C., S/Sgt.
Cullender, Joe P., Lt.
Cullum, William W., Maj.
Cuts, Fred K., Capt.
Culpeper, Claude A., Capt.
Culver, James H., T/Sgt.
Cumberland, Horace W., Lt.
Cummings, Earl W., Lt.
Cummings, Joseph F., Sgt.
Cummings, Truman W., Lt.
Cummings, William R., Capt.
Cunat, Rudy J., Jr., S/Sgt.
Cunio, Frank L., Jr., T/Sgt.
Cunningham, Cletus A., Capt.
Cunningham, Don F., Capt.
Cunningham, John F., Lt.
(& OLC)
Cunningham, Ronald W., S/Sgt.
Cupp, Glen E., Capt.
Cupp, Ray V., S/Sgt.
Cupp, Robert J., S/Sgt.
Curdor, Louis E., Lt.
Curry, Vernell, S/Sgt.
Currie, Alden H., Lt. (& OLC)
Currie, Alexander D., Lt.
(& OLC)
Currie, Herman C., Lt.
Currie, Robert P., Lt.
Curry, William L., Lt.
Curtis, Alden B., S/Sgt.
Curtis, Fred J., Lt.
Curtis, Floyd W., Sgt.
Curtis, Howard S., Lt. (& OLC)
Curtis, Joseph R., Lt.
Cushman, Joseph A., Sgt.
Custantine, Peter J., Jr., S/Sgt.
Cutforth, Charles Clifton, Lt.
Czarnocki, Edward J., Lt.
Dabney, Thomas T., Capt.
Daboll, Robert L., Lt.
D'Agata, Charles, T/Sgt.
Dager, Walter C., T/Sgt.
Daguerre, William E., Lt.
Dahl, Arvid S., Lt.
Dahl, Myron A., S/Sgt.
Dahlberg, Douglas C., Lt.
Dailley, John F., Jr., Lt.
Daily, Marion L., T/Sgt.
Dale, Don, Lt.
Daley, John A., Lt.
Dallas, Raymond E., T/Sgt.
Dalrymple, Edwin, Lt.
Daly, Donald J., T/Sgt.
Daly, Edward J., Capt.
Daly, Herbert B., T/Sgt.
Daly, Raymond C., Lt.
Daly, William J., Jr., Lt.
Damm, Russell J., S/Sgt.

Damsz, Thaddeus M., Sgt.
Dana, Joseph R., S/Sgt.
Dagaher, Allen W., S/Sgt.
Dagaher, Jack, Lt.
Dando, Donald A., S/Sgt.
Daniel, Jack H., S/Sgt.
Daniels, Claude, S/Sgt.
Daniels, James T., S/Sgt.
Daniels, Luther M., M/Sgt.
Daniels, Patrick H., III, Lt.
Danks, Henry L., S/Sgt.
Dannacher, Carlos E., Lt.
Darby, Culmer H., S/Sgt.
Darby, George C., Jr., Capt.
Darby, Howard C., M/Sgt.
D'Arcangelo, Emilio, Sgt.
Darling, Arthur R., T/Sgt.
Darragh, Fred K., Jr., Lt.
Darrow, George R., F/O
Dau, Ray S., Lt.
Daugherty, Paul P., Sgt.
Dauphin, Ray, Capt.
David, Aaron A., S/Sgt.
David, Dan H., Lt. (& OLC)
David, Herman W., Sgt.
David, James K., Lt.
David, Nolan J., S/Sgt.
David, Stephen L., Lt.
David, William B., Col.
Davies, Louis, S/Sgt.
Davidson, Collier H., Capt.
Davidson, Leslie L., Lt.
Davidson, Robert B., Sgt.
Davidson, William R., Lt.
Davies, Edwin R., Lt.
Davison, Norman L., S/Sgt.
Davis, Adrian A., Lt.
Davis, Albert C., S/Sgt.
Davis, Alfred T., T/Sgt.
Davis, Billy T., S/Sgt.
Davis, Calvin C., T/Sgt.
Davis, Charles J., S/Sgt.
Davis, Charles M., S/Sgt.
Davis, Clifton C., Lt.
Davis, David Harold, Lt.
Davis, Don M., Lt.
Davis, Edward W., F/O
Davis, Emmett S., Maj.
Davis, Ernest D., F/O
Davis, Eugene C., T/Sgt.
Davis, George H., Lt. (& OLC)
Davis, Glen P., Sgt.
Davis, Harley B., Lt.
Davis, Harvey, M/Sgt.
Davis, James J., T/Sgt.
Davis, Herbert W., Capt.
Davis, Howard C., S/Sgt.
Davis, Jack A., T/Sgt. (& OLC)
Davis, James, Lt.
Davis, Jesse C., Capt.
Davis, James M., S/Sgt.
Davis, John M., Lt.
Davis, Lewis C., T/Sgt.
Davis, Marvin, Lt.
Davis, Max E., Capt.
Davis, Mercer P., Capt.
Davis, Richard G., Capt.
Davis, Robert E., Capt.
Davis, Robert H., Lt.
Davis, Roy B., Jr., S/Sgt.
Davis, Walter K., Lt.
Davis, William D., T/Sgt.
Davis, William H., Lt.
Davis, Zias D., Lt.
Davis, Richard S., T/Sgt.
Davitt, William J., Capt.
Davoren, Albert J., Jr., Lt.
Dawson, John L., T/Sgt.
Dawson, John M., Lt. (& OLC)
Dawson, Madison E., Cpl.
Dawson, Richard B., T/Sgt.
Dawson, Robert M., S/Sgt.
Dawson, Thomas W., Jr., S/Sgt.
Daworske, Carl W., Lt.
Day, Edward W., Sgt. (& OLC)
Day, John R., S/Sgt. (& OLC)
Day, Rayford L., S/Sgt.
Day, Vourhis H., Lt.
Dayhuff, Harry J., Lt. Col.
Dean, Joseph S., Lt.
Dean, Marvin E., S/Sgt.
(& OLC)
Dean, Zach W., Lt. (& OLC)
Deather, Charles H., Lt. (& OLC)
Death, Edwin K., T/Sgt.
Debarth, Francis, T/Sgt.
De Baun, Clyde E., Lt.
De Boer, Eugene C., Lt.
De Bruy, Paul G., Jr., S/Sgt.
De Buiy, Edward S., S/Sgt.
Decelles, Robert W., S/Sgt.
Decker, Kenneth R., S/Sgt.
Decker, Richard E., Capt.
Deer, Joe H., Lt.
Deels, John T., Jr., S/Sgt.
Defford, Charles E., S/Sgt.
De Ford, Earl H., Col.
De Graffenreid, Edwin L., Lt.
(& OLC)
De Gregorio, Italo N., Pvt.
De Haven, Robert M., Lt.
De Hoo, John, Lt.
Dekker, William M., Maj.
Delehay, William A., Capt.
Deleaire, John B., T/Sgt.
Delano, Edward J., T/Sgt.
Delembre, Samuel J., S/Sgt.
Delcamp, Robert G., Lt.
De Conte, Albert A., T/Sgt.
Dei, Chester R., S/Sgt.
Deil, Leland E., Lt.
Deimonico, Frank J., S/Sgt.
De Loach, Ralph K., Capt.
Dei Villaggio, Carl P., Cpl.
Demitropoulos, Andrew P., Lt.
Demoss, Edward L., T/Sgt.
De Moss, Lloyd K., Capt.
Demsey, Jack D., Capt.
Demsey, James C., Jr., Lt.
Demsey, Robert C., Maj.
Demsey, Thomas M., Sgt.
(& OLC)
Demsey, Timothy W., Lt.
De Mynck, Jimmie M., S/Sgt.
Denault, Francis P., Lt.
(& OLC)
Denayer, John C., S/Sgt.
Denard, Donald R., Sgt.

(Continued on Page 63)

THIS IS YOUR ENEMY

German Fighters ☆

Our Targets in Japan ☆

Jap Deserters ☆

B-29 TARGETS. Japan's heavy industries, now targets of the 20th Air Force, are concentrated in less than ten main cities in Japan proper. The country's largest steel smelters are at Yawata, target of the first two B-29 raids, on the island of Kyushu. The naval base of Sasebo, hit on the second raid, also is on this island.

Tokyo, stretching out to its port, Yokohama, is the farthest eastward of the important cities. A new metropolis, Nagoya, containing great textile mills lies 160 miles westward. Further west is Kyoto, and thirty miles from there is the city of Osaka, with a population of 3,350,000 and many industrial factories. Kobe, the port of Kyoto and Osaka, has 1,100 factories itself.

Japanese-held territories contain important industries, too, such as the aluminum plants in Formosa, hydro-electric plants in Korea, and the Mukden Arms Manufacturing Company in Manchuria.

One thing that must be remembered is that Tokyo isn't going to burn down and blow away the first time it is attacked on a big scale. The idea that this city is merely a collection of paper houses is wrong. Tokyo is bigger than Berlin and smaller only than London and New York. It has a population of about 7,000,000 and covers 217 square miles. The center of the city, rebuilt (with a lot of American help and money) after the earthquake in 1923, is like a modern occidental city. It has big steel and concrete buildings and broad streets which were built as fire-breaks in the outlying, flimsily-constructed districts.

The experiences of the 1923 earthquake will help the Japanese when our bombs start taking the town of Tokyo apart. Because they have long expected another earthquake, they built their business and industrial sections especially to withstand shock, concussion and flames. Special architectural techniques, some of them first displayed by Frank Lloyd Wright when he built the Imperial Hotel—the only building to stand up during the quake, have enabled the Japanese to construct buildings which can withstand terrific shocks.

The industrial belt of Tokyo strings out some 18 miles from the center of the city with factories, shipyards, naval bases, piers, warehouses and arsenals reaching down the Bay of Tokyo to Yokohama. Yokohama has some 4,500 factories and

huge wharves capable of handling large ships.

GERMAN METHODS. One crack German unit which had seen a lot of action in Africa, Sicily, Italy and USSR led a fairly tough life, analysis shows, as well as developing some reasonably smart tactics.

Because their aircraft were scarce, the fighter group was subject to call from daybreak until nightfall, strenuous duty which had many pilots close to cracking. They were often given "Gewaltauftrage," a type of order which must be accomplished or else the pilot must not return. Most of these were for two kinds of missions—interception of Allied reconnaissance craft or long reconnaissance flights of their own.

If a pilot was ordered to get an enemy reconnaissance plane, he *had* to get it. If he ran out of ammunition, he was supposed to ram the plane. On long range reconnaissance, the members of this group were usually given some escort. The maps they carried contained no markings or notations which would give military information in case they were shot down, and the pilot and his cover pilot were not permitted to communicate with each other by radio. Often, when they came in after a mission, one pilot would have to go immediately to headquarters for questioning. Then the other pilot was permitted to land and he also was questioned. The pilots were given no chance to get together, compare notes or make up a story before reporting.

The outfit flew ME-109-G6s, equipped with five machine guns, three of one kind and two of another. The planes had very high grade, bullet-proof windshields. An expensive, extra-high explosive ammunition, which could penetrate bullet-proof windshields, was issued sparingly to old-time pilots.

JAP TRAINING. The Japanese Army gives its pilots training which resembles considerably the nursing along, from bush leagues to minors to majors, received by

American infielders before the present war.

A Jap pilot gets his primary, basic and advanced training in southern Japan and in Manchuria. From there he is moved to Formosa for operational training which consists of flying bombers and fighters over the Chinese east coast.

After learning how to kill defenseless people and how to bomb unarmed targets, the pilot goes to the Hong Kong-Canton area where the Japs control a few hundred square miles. He will meet American in-



terception in this area, and normally flies only ten or twelve missions. He then goes to Burma and from there to the Philippines and South Pacific islands.

By the time he gets to the islands he is a fairly well-trained pilot with combat experience and a good knowledge of his plane and of battle formations.

When he is relieved from South Pacific duty, under the Japanese system of rotation, he takes the same route home he took out.

Used as a flight, squadron or element leader, he passes on his knowledge to younger pilots on tours of duty in Burma, Hong Kong-Canton and Formosa. Then he gets a rest in his homeland—that is, if he gets there.

HERE'S HOW. Some more of Dr. Goebbels' weird propaganda broadcasts were put on the air just after a heavy Allied raid over Germany recently. The Nazis first said that "an attempt" to bomb them had been made, then claimed they destroyed 123 of our planes, and, some time later, said they had knocked down 136 of our aircraft. The broadcasts, which had little or no facts in them, ended with a rather interesting talk by a Lieutenant Beckmann of the Luftwaffe.

"The great success of our fighter and long range fighter formations is a result of the long and hard schooling of German pilots," he said.

During the last twelve months the German fighter arm has gone through a development which must probably be numbered among the hardest in this war. When the first large formation of four-engine bombers appeared, many a fighter pilot experienced the same psychological effect that infantrymen felt in 1917 when

the faster and more mobile fighter. It is, however, a target which, because of the closeness of its formation, has a strong firepower, effective in all directions."

TANKS. Tanks knocked out by Allied gunfire from ground troops or strafing planes are often quickly and efficiently salvaged by the Germans. In fact, the Nazis' ability to save a tank often amazes our Armored Force officers.

One reason the Germans are often successful in recovering damaged tanks is that they try to get them out of the vicinity very soon after they are hit. Each German tank carries two towing cables 20 to 25 feet long. On each tank the cables are arranged so that one is fastened in front on the right and is laid toward the rear, and the other is fastened in back on the left and is carried toward the front. Thus if one tank is damaged and needs the help of another tank, each will have only one cable to attach or detach.

with cranes. But in any case, the tank men tried — and hard — to rescue their damaged tank.

FIGURING THINGS OUT. Our methods of taking islands away from the Japanese have been giving the little men some cause for thought. The Japs' analysis of one of their battles with us is as follows:

"Consider the enemy's selection of landing points. Perceiving the weakness of our defenses on the lagoon side, he first moved his convoy into the lagoon and anchored there; then, from the lagoon, he commenced his 'roundabout' landings at our rear. Study of this battle reveals several tactical changes which bear mention; namely:

"In planning the defenses of an atoll, remember that the enemy's landing front is not necessarily restricted to the sea side alone. It is essential to have installations on the lagoon side, too.

"Furthermore, for the equipping and organizing of positions, we believe that there must, as a matter of course, be constant instruction and training in night firing, close-quarter combat, the shifting of weapons as opportunity dictates, and the utilization of mobility of men and weapons."

OVER THE HILL. Now that fighting in the South and Central Pacific is getting *really* tough, the Japanese have been having trouble with their young men deserting. Not that there are many places for them to go, but they just want to get away from where they are.

Here is the way one fellow felt:

"Mental power is the thing.

"Shortage of provisions and fuel.

"Regarding a case of desertion we had recently. Was it because of his mental weakness?

When we think of the physical labor, mental fatigue and shortage of supplies we have experienced in the past ten days, it seems we can understand how weak he was. Maybe he had his own idea. Who knows?"

He said the deserter was captured, adding:

"I wonder how he felt . . . Now he has to spend his life as a prisoner. We can't do anything about it because, after all, it was he who committed a crime. I only hope for the best. It is we who feel more pained than he as we stand on guard and watch him."

EXTENSIVE DESTRUCTION. An order recently was sent to certain members of his staff by a Nazi general, and presumably, carried out to the letter. It outlined the destruction of the "last but legally obtained Westphalian ham and the destruction of a large number of Westphalian cakes," at a breakfast. The rest of the general's troops had the regular breakfast of bread and ersatz coffee. ☆



Building but one airstrip on each strategic island has often cost the Japs a concentration of planes in a single AAF attack. Now they are increasing such facilities and dispersing grounded aircraft. These photographs were taken by Capt. L. P. Bachmann of the AIR FORCE overseas staff when Mokmer Field on enemy-held Biak island was struck, with a Japanese loss of twelve planes. Two new strips (above) were being completed nearby and Biak, therefore, needed blasting.

the first large formations of tanks appeared. But the shock was only of short duration. The command realized that the impetus of this enemy weapon could only be met by the same impetus. A mass attack could only be met by a mass defense. The enemy, who attacked in close formation, wingtip to wingtip, had to be fought by the same methods . . .

"Now fighters fight shoulder to shoulder as in an infantry assault . . . (which) mean a re-orientation from individual patrol to patrol-in-formation which imposed on the leader of the squadron the task of being clear about the tactical situation at all times . . . In contrast to the fighter, the bomber flying in close formation forms a stable target whose evasive actions are in no proportion to those of

An example of German persistence was shown in one battle when a German tank slid into a ditch and bellied so the tracks wouldn't grip. The tank signalled the one nearest it for help. While gunfire held off our infantry, the tankman fastened the cables, one on each side. The pull was uphill, and the rescuing tank was unable to get the bellied one out.

That night, two more tanks joined the attempt, fastened their cables, but still were unable to get the tank moving. The damaged tank was then stripped and abandoned. Observers say, though, that had the Germans had one of their eighteen-ton half-tracks available the tank would have been rescued. These powerful towing tractors, called *Zugsmaschine*, do all kinds of heavy work and can be equipped

AIR WACS OVERSEAS

Working side by side with Air Force men in foreign theatres, Wacs are playing an important part in the success of AAF operations.

Although Air Wacs overseas are now primarily in England, North Africa and Italy, they are destined eventually to see service at AAF stations all over the world. At one time, Air Wacs were assigned principally to replace men performing clerical tasks in England and Italy to enable the latter to participate more actively in the Italian push and the invasion of Normandy. Now that the ball is rolling in Europe, however, many requisitions for Air Wacs received from commands in the Pacific area are gradually being filled. Especially for those jobs which women normally perform have Wacs been in demand but, as these positions are filled, overseas organizations are beginning to use Wacs in a wider variety of AAF assignments. ☆



Blankets, sidewalk, grounds get a going over from these Wacs who have set up light housekeeping in a prefabricated hut at an airbase in England.





Maj. Gen. W. E. Kepner, Lieut. Gen. Carl Spaatz, Maj. Gen. B. M. Giles plan operational flights at fighter station in Britain while in the foreground Lieut. Ruth Adams carries on her regular work.



In weather, communications, supply and control offices, Wacs can be found performing important jobs. Cpl. Zelma E. Hazelton, who is an 8th Air Force photo interpreter, is shown above spotting maps.



Mail from home means a lot to these Wacs who crowd into their barracks in North Africa to see whether Cpl. Julia Yonko has a letter for them. They are attached to the AAF Service Command in the Medi-

terranean Theatre of Operations where they are performing a variety of jobs in the photo labs, staff offices, message centers, radar and cryptographic sections and other sections of the command.

Eventually scheduled to move across the Channel for headquarters jobs in France, these Wacs are sure to make use of a knowledge of French. With instructor's help, they speak only French during their meals.



Sgt. Bobby Marion, chief clerk in the A-1 section of an AAF unit in North Africa, stops to have her shoes shined by an Arab bootblack. The sailor standing alongside is waiting his turn for shine.





Their day's work done, these Wacs stationed at a medium bomber headquarters in England whip up a midnight snack. One of the young women has obviously come a long way and expects to go much farther.



At 9th Air Force headquarters, Sgt. June C. MacWilliams is private secretary to Brig. Gen. Samuel E. Anderson. At the present time the majority of Air Wacs are filling positions as secretaries and typists.



Air Wacs at this telephone switchboard in 8th Air Force headquarters are the connecting link between their headquarters and other AAF commands around the globe. Staff Sgt. Alice B. Stanly (right) is supervisor.

Kneeling before the altar in a small church in southern Italy, eight Air Wacs of the MAAF receive communion from the village priest.



Roll of Honor

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

(Continued from Page 57)

Dennen, Arch A., Jr., Lt.
Dennis, John S., Capt.
Dennis, Robert W., Capt.
Dent, Elliott E., Jr., Lt.
Denton, Guy O., Lt.
Denton, Harris L., Lt. (& OLC)
Derako, Ignatius R., T/Sgt.
Deer, Herbert O., Lt.
Derrick, Daniel F., Lt.
Derringer, William D., Jr., Sgt.
Deruntz, Leo, Lt.
Desmond, Arthur P., Lt.
Dessert, Kenneth O., Maj.
Dethlefsen, Robert E., Capt.
Dettweiler, Richard O., T/Sgt.
Devane, John L., Lt.
Deverger, Claude E., S/Sgt.
Devers, Harry M., Lt.
Deveuve, James P., Lt.
Devine, Daniel A., Sgt.
Devine, James G., Jr., S/Sgt.
Devine, Joseph F., S/Sgt.
Devos, Robert W., Jr., S/Sgt.
De Voss, Virgil E., S/Sgt.
(& OLC)
Dewalt, Arthur E., S/Sgt.
Dewees, Cecil D., Lt.
Dewey, George G., Capt.
Dewey, Robert C., Sgt.
De Wolf, Earl T., Lt.
De Wolf, James G., Capt.
(& OLC)
Dexter, John H., Capt.
De Young, Clarence R., Lt.
Dibble, Robert E., Lt.
Di Bella, Louis F., Jr., Sgt.
Dickerson, Fred A., S/Sgt.
Dickerson, Harry S., S/Sgt.
Dickerson, Joe P., S/Sgt.
Dickey, Julian A., Lt.
Dickie, Earl B., S/Sgt.
Dickinson, Paul A., T/Sgt.
Dieffenderfer, James C., Lt.
(& OLC)
Diegman, Francis L., S/Sgt.
Dietrich, Donald P., Lt.
Diggett, Edward S., Lt.
Dilbeck, Boyd W., Pfc.
Dilbeck, Guss M., S/Sgt.
Dille, Marvin E., Lt.
Dillenbeck, Francisco H., S/Sgt.
Dillon, Stephen P., Lt.
Dills, Jay H., S/Sgt.
Diltz, Orrin D., S/Sgt.
Dilworth, Harry B., Lt.
Dimuzio, Carmen C., T/Sgt.
Dingwell, Leverage G., Lt.
Dinguardo, Fred J., S/Sgt.
Dipple, Alan N., S/Sgt.
Dirickson, Conwell F., Jr., Lt.
Dirr, George E., Jr., T/Sgt.
(& OLC)
Disalvo, Joseph F., Lt.
Discher, Raymond J., Capt.
Disilvio, Joseph, T/Sgt.
Ditchey, Martin W., Capt.
Ditto, Hubert M., Lt.
Divine, Dwight II, Col.
Dixon, Celestial, S/Sgt.
Dixon, James V., S/Sgt.
Dixon, Norman E., Lt. (& OLC)
Dixon, Richard B., Capt.
Doar, Jean P., Lt.
Dobson, Benjamin E., T/Sgt.
Dodds, Alton L., T/Sgt.
Dodson, Henry J., Lt.
Dodson, Joe E., Lt.
Doherty, Francis J., Lt.
Doherty, James S., S/Sgt.
Doherty, John J., S/Sgt.
Doiron, Walter A., T/Sgt.
Dolan, Charles F., Lt.
Dolan, James E., S/Sgt.
Dolan, Joseph A., Lt.

Dolan, Thomas C., Lt.
Dolney, Joseph, T/Sgt.
Doman, Russell F., T/Sgt.
Domenick, Rowland, S/Sgt.
Donadio, Edward R., S/Sgt.
Donahay, Homer D., T/Sgt.
Donahue, Francis E., S/Sgt.
Donahue, William H., Pfc.
(& OLC)
Donaldson, Donald D., T/Sgt.
Donaldson, Jack I., Lt.
Donley, Harold E., Lt.
Donley, Reece D., S/Sgt.
Donnell, Leroy R., Lt.
Donnelly, James M., S/Sgt.
(& OLC)
Donovan, Stanley J., Col.
Donohue, John W., Lt.
Donovan, Bradford P., Lt.
Donovan, Francis, S/Sgt.
Donovan, John B., Lt. (& OLC)
Donovan, Michael E., Lt.
Dooley, Joseph F., S/Sgt.
(& OLC)
Dooley, William J., Lt.
Doordan, John E., Lt.
Doran, Arnold S., T/Sgt.
Dore, John J., Jr., Lt.
Dorison, Paul P., S/Sgt.
Dorman, Theodore M., Capt.
Dorwart, Robert J., Lt.
(& OLC)
Doss, Carroll P., T/Sgt.
Doss, Charles E., T/Sgt.
Dossy, Don E., Lt.
Doster, Lawrence E., Lt.
Doty, Elmer S., Jr., Lt.
Dougherty, Frank E., Lt.
Dougherty, Kenneth W., Lt.
Doughty, Edward J., T/Sgt.
Doughty, William R., S/Sgt.
Douglas, Charles E., S/Sgt.
Douglas, Gerald V., Lt.
Douglas, Harold W., Cpl.
Douglass, James R., Lt.
Dove, J. D., S/Sgt.
Dowda, Van D., Lt.
Dowell, Charles W., Capt.
Dowell, Wade G., T/Sgt.
Dowie, Frank D., Jr., Capt.
Dowling, James M., Lt.
Dowling, George J., Jr., Lt.
Downer, Charles B., Lt. (& OLC)
Downey, Daniel A., Lt.
Downey, Joseph W., Lt.
Downey, Martin H., Lt.
Downing, Andrew H., Jr., Lt.
Downs, Robert G., T/Sgt.
Downs, William F., S/Sgt.
Doyle, Charles J., S/Sgt.
Doyle, Gray H., Lt.
Doyle, Joseph F., Lt.
Doyle, Richard W., Lt.
(& OLC)
Doyle, Roger H., Lt.
Doyle, Thomas E., Lt.
Doyle, Thomas F., Jr., Lt.
Dozier, Jack B., Lt.
Drabnis, Alfred, F/O
Draegert, Maurice A., T/Sgt.

Draemel, Dean H., Capt.
Draschitz, John H., S/Sgt.
Drake, Carl H., Sgt.
Drake, Robert W., Lt.
Drake, Steward F., T/Sgt.
Dreasher, Gene R., Capt.
Drees, Fred W., Jr., Lt.
Drees, Joseph R., Sgt.
Dreiszum, Abraham J., Lt.
Drennan, Billy H., T/Sgt.
Drew, Samuel F., F/O
Drew, Theodore S., Lt.
Drew, Troy, Lt.
Drewhin, William W., S/Sgt.
Driggers, Chester A., Lt.
Driscoll, F., S/Sgt.
Driscoll, Hugh T., T/Sgt.
Driscoll, William A., Lt.
Drougas, John J., Sgt.
Droz, Paul C., Maj.
Drowning, William, Lt.
Dryer, Russell T., T/Sgt.
Duane, James W., Lt.
Ducci, Ercoll, Lt.
Duckworth, Lawrence A., Cpl.
Duclos, Bernard V., Sgt.
Dudas, Louis J., T/Sgt.
Dudash, Charles J., M/Sgt.
Duesten, Carl H., Lt.
Duell, William S., T/Sgt.
Duerst, John W., Lt.
Duff, David D., Lt.
Duffy, Edward B., S/Sgt.
Duffy, James F., Lt.
Duffy, James M., Lt.
Duffy, John E., Jr., Capt.
(& OLC)
Duffy, Lawrence Williamson, Lt.
Duffy, Robert R., S/Sgt.
Dufour, John C., Maj.
Dugger, Fred M., Jr., S/Sgt.
Duke, Paul L., T/Sgt.
Dulaney, Cecil Gordon, Lt.
Dulberg, Herbert W., S/Sgt.
Dumas, James L., Lt.
Dumond, Lloyd T., S/Sgt.
Dunbar, John C., Lt. (& OLC)
Dunbar, Roger D., Capt.
Duncan, Charles V., Lt.
Duncan, Frank A., Lt.
Duncan, Gene, Lt.
Duncan, Glenn E., Lt. Col.
Duncan, Robert E., Lt.
Duncan, Vernon D., Lt.
Dunham, Harry H., Lt.
Dunham, William D., Capt.
(& OLC)
Dunhill, George L., S/Sgt.
Dunkelberger, Joseph L., Capt.
Dunken, Allen G., Lt.
Dunlap, Donald S., Maj.
Dunlap, John M., Lt.
Dunlap, Wesley W., Capt.
Dunn, James C., Lt.
Dunn, James L., Lt.
Dunn, James W., Lt.
Dunn, Philip H., Lt.
Dunn, Robert J., Lt.
Dunnaway, Donald D., T/Sgt.

Duntelman, John W., S/Sgt.
Duras, Manuel J., S/Sgt.
Durbeck, Arthur G., Lt.
Duree, William S., Lt.
Durham, John C., Lt.
Durham, Leland F., S/Sgt.
Durham, Marvin J., Sgt.
Durip, Wilder J., Capt.
Durip, Thomas H., Lt.
Dustin, George W., Cpl.
(& OLC)
Dustin, Kenneth H., Lt.
Dutton, Albert H., Lt.
Dval, Robert J., Maj.
Dye, Daniel B., S/Sgt.
Dwiggins, Robert D., T/Sgt.
Dwyer, Robert P., Lt.
Dye, Glen W., Capt. (& OLC)
Dye, James D., Lt.
Dye, Thomas B., T/Sgt.
Dyer, Marvin E., Jr., S/Sgt.
Dykens, Sybrant, Lt.
Dyminski, Henry J., Capt.
Dyrlund, Bernard A., Lt.
Eagan, William J., Jr., Lt.
Eakins, Thomas A., Lt.
Ealey, Robert E., Lt.
Eareckson, William O., Col.
Earley, Vernon W., T/Sgt.
Eckert, Henry V., T/Sgt.
Earnest, William R., S/Sgt.
Earnshaw, Sidney S., S/Sgt.
Eason, Hoyt A., Lt.
Eason, William M., T/Sgt.
Eastham, David B., Lt.
Eastline, Donald M., Lt.
(& OLC)
Eastman, Philip M., S/Sgt.
Eaton, John M., Lt.
Eaton, William R., S/Sgt.
Eaves, John B., Lt.
Eberhardt, Elmer, F/O
Ebert, Edwin P., Lt.
Eckert, Robert J., Lt.
Eckert, Philip M., Capt.
(& OLC)
Eckhardt, Carl, Lt.
Eckhart, Alan, Lt.
Eckholt, David K., Pfc. (& OLC)
Eckold, Eugene, Lt.
Eddy, James G., Lt.
Eddy, Leonard A., Capt.
Edgar, Thomas D., Cpl.
Edgarian, Arthur A., Lt.
Edinger, Joseph R., S/Sgt.
Edmonds, Benjamin B., Capt.
Edmonds, Carl R., Lt.
Edmondson, James V., Maj.
Edwards, Glen W., Capt.
Edwards, Harry L., S/Sgt.
Edwards, Hoover, Lt.
Edwards, J. R., S/Sgt.
Edwards, Jack B., Pfc.
Edwards, Jack J., Lt.
Edwards, Sherman L., S/Sgt.
Edwards, Theodore H., Sgt.
Ernisse, Abram, Sgt.

Egnas, Leif A., Capt.
Egan, John C., Maj.
Egan, Joseph L., Jr., Lt.
Egan, Michael E., Lt.
Egan, Wesley W., T/Sgt.
Egnor, Robert W., T/Sgt.
Ehlen, John J., T/Sgt.
Ehlinger, John L., Lt.
Ehrenberg, Jack R., Lt.
Ehrhardt, Clark A., S/Sgt.
Ehrke, Howard S., T/Sgt.
Eichmann, Edward W., S/Sgt.
Edson, Jordon B., Sgt.
Edson, Marvin C., T/Sgt.
Einbinder, Sylvan P., Lt.
Einer, Arvid H., S/Sgt.
Eisenhart, Clyde L., T/Sgt.
Eisinger, Arnold H., Lt.
(& OLC)
Ekas, Frank S., Lt.
Ekberg, Harry A., Lt.
Eknes, Orval, Capt.
Elder, William E., Lt. Col.
Eldridge, Russell H., T/Sgt.
Eldridge, Wayne K., S/Sgt.
Elezzer, James M., T/Sgt.
Elek, John F., S/Sgt.
Elias, Victor H., S/Sgt.
Eliot, Harold D., F/O (& OLC)
Eisenberger, Samuel G., Lt.
Eliot, Marshall J., Lt.
Ellifritz, Vernon, Lt.
Ellington, Paul M., Lt.
Elliot, Richard E., Lt.
Elliott, George E., Capt.
Elliott, Robert C., S/Sgt.
Elliott, W. H., Sgt.
Elliott, William M., Lt.
Elliott, Wilson C., T/Sgt.
Ellis, Donald O., S/Sgt.
Ellis, Harry L., S/Sgt.
Ellis, Henry C., Lt.
Ellis, Joseph W., Lt.
Ellis, Robert L., S/Sgt.
Ellis, Stephen P., S/Sgt.
Ellison, Joe A., Lt.
Elkworth, John A., S/Sgt.
Elmerick, Robert P., Pvt.
Elfson, Elford L., Lt.
Elphinstone, Michael P., T/Sgt.
Elrod, William W., Pfc.
Elsasser, Henning F., Sgt.
(& OLC)
Eisenberg, Everett A., Capt.
Elston, Maurice, Lt.
Eltrough, Ralph E., Lt.
Ely, Franklin W., Lt.
Embrey, Ralph C., Lt.
Embry, William P., Capt.
Emch, David W., Lt.
Emrick, Russell S., Lt.
Emmke, Elwin C., S/Sgt.
Emrich, Daniel C., Lt.
Enderton, Charles M., Capt.
Endsley, Horace L., S/Sgt.
Engel, Godfrey, Jr., Lt.
Engle, Kenneth O., S/Sgt.
Engleman, George B., T/Sgt.
English, Albert J., Lt.
Englisch, John P., Sgt.
Engstrom, Marshall J., S/Sgt.
Ennor, John T., Lt.
Enos, Manuel J., T/Sgt.
Ensbury, Stanford A., Lt.
Ent, Uzal G., Brig. Gen. (& OLC)
Fletcher, Isaac A., T/Sgt.
(& OLC)
Jones, H. C., T/Sgt.
Kincaid, Thomas, Sgt.
Light, Herbert M., Capt.
(& OLC)
Parsons, Douglas V. N., Lt.
Piller, Laverne H., S/Sgt.
Pogurski, Henry A., 1/O ☆

Answers to Quiz on Page 41

- (d) 1,600 miles
- (a) True
- (b) Lodestar
- (a) 1,700
- (a) Mile
- (a) Black Widow
- (b) False. It is best made under power, if possible.
- (d) Mindanao
- (a) Lieut. Gen. Lewis H. Brereton
- (b) The Marianas
- (b) The switch is off
- (c) Single-engine fighter
- (a) 20 percent
- (d) 6,000 rounds
- (d) 105 mph
- (d) \$8,000
- Incendiary
- (c) 150 mph
- (c) Seattle, Wash.
- Left hand: throttle; right hand: control stick.

MISTAKES IN 'ON THE LINE' PICTURE ON PAGE 55

- We sound off with the cooling cap mounted in the wrong position, which will impose excessive heat on the turbo wheel. Result: wheel is subject to warpage, will lose efficiency, and there is risk of the wheel flying to pieces. Check in AN 03-10DA-1.
- Where, oh where, are the safety wires on the nozzle box? Without them, bolts may loosen due to vibration, fall off and result in loss of cap. This will cause turbo wheel to overheat, and the buckets may fall out.
- There is an unwritten AAF law, ON THE LINE, that all bolts must be inserted pointing down or to the rear. Reason is that if the nut comes off, the bolt stays in. Not so in the picture, where the bolts point forward; also incorrect is the use of fiber lock nuts where there is heat. These nuts will burn up and lose effectiveness.
- Dangle, dangle, the balance line is not connected. Somebody had better connect it or the supercharger regulator will not work. Just as an added note here, men, be positive

the elbow is free from carbon. Else the balance line will be stopped up and rendered ineffective.

- You super-sleuths probably have discovered already that the turbo cooling blast tube has not been installed. It *must* be. Excessive heat on the turbo will cause warpage of the turbo case, also cause the bucket wheel to drag. Your references: AN 03-10DA-1 and TO 01-5EC-2.

- Whoa there, the expansion universal joint of the exhaust stack is assembled wrong. The male fitting should be to the front, the female to the rear. Here they are reversed which will cause the springs to become overheated and lose their effectiveness. An exhaust flame from an engine is like an acetylene torch: once started, it will burn fast. This is a definite fire hazard—see for yourself in TO 01-5-101.

- Just as this picture was snapped, FASC's safety director strolled up to ask why a crew chief's stand wasn't used instead of a wobbly ladder. We wonder, too.

CROSS COUNTRY

(Continued from Page 1)

serve in the following grades: captain for squadron, major for group, lieutenant colonel for wing and division and colonel for command headquarters.

Application blanks and authorization to take the WD,AGO Form No. 64 physical examination (modified as specified) and the special selection test for flexible gunnery officers may be obtained from the AC/AS, Personnel, Military Personnel Division, Aviation Cadet Branch, Army Air Forces, Washington, D. C.

☆

A STAFF sergeant of our acquaintance, on temporary duty at the Pentagon in Washington, has returned to his regular post with a nervous tic which causes him to make strange gurgling noises, and for no visible reason the man will suddenly lace and unlace his right shoe rapidly a dozen times. Here is his story. The sergeant got his staff rating while on temporary duty and promptly bought a new uniform in a PX. He took this to the tailor shop in the Pentagon and asked that new chevrons be sewed on the shirt, and that the trousers be made 31 inches. They were ordinary sun tan chino and the man had no misgivings. The uniform was delivered, neatly wrapped, and the sergeant planned to wear it his first night back home. He got a hair cut and tonic, bathed himself well and made his toilet with meticulous care. He opened the package and put on the shirt. Then he noticed the trousers. They were finished with a two-inch cuff.

☆

RECENTLY an AIR FORCE correspondent suggested this war might produce some symbol to replace the 40 and 8 box cars which hauled doughboys across France in the other conflict. Quicker than you could say Jack (NMI) Robinson a fighter pilot in North Africa pounced on the idea like a duck on a June bug. His dissenting opinion: "It is still the 40 and 8," wrote Lieut. Shuford M. Alexander. "I am only one of many pilots who have ridden it across North Africa, a little over 1,000 miles to be exact. We spent five days and five nights in one—and to live up to its name the Army had just hauled eight horses in it. The smell wasn't so bad, once you got used to it, and in three days we outsmelled the car. The only difference between these and the ones in the last war is that they are 25 years older. For my money the 40 and 8 is even a better memory of this war than the other one. I don't think the hundreds of men who have ridden in one will let you get away with a substitute. There is none. No matter where you look, there is none."

☆

LIEUT. Gen. George C. Kenney, commander of the 5th Air Force for 22 months, has been appointed to head the new Far Eastern Air Force, into which the

5th and 13th Air Forces have been combined. Headquarters of the new command is in Australia. Maj. Gen. Ennis C. Whitehead, who served under General Kenney as deputy commander, is now commanding general of the 5th Air Force. Maj. Gen. St. Clair Streett became commanding general of the 13th, succeeding Maj. Gen. Hubert R. Harmon, who returned to the United States as commanding general of the AAF Personnel Distribution Command.

PARACHUTES—LOST AND FOUND

LOST:

No. 42-191317, seat type, return to Operations Officer, AAF Pilot School (Basic), Majors Field, Greenville, Tex.

No. 42-221483, seat type, communicate with Parachute Department, 2514th Base Unit, Section C-2, Laughlin Field, Del Rio, Tex.

No. 41-13517, seat type, return to Operations Officer, Lowry Field, Denver, Colo.

Nos. 42-1041347, 42-1041360; furnish information on these to Sub-Depot Supply Officer, 47th Base Sub-Depot, Army Air Base, Jackson, Miss.

No. 42-2734, seat type, S-1, return to Headquarters, Office of the Supply Officer, 23rd Tow Target Squadron, APO 832.

No. 40-3133, 42-446002, return to 2131st AAF Base Unit, Section A, Office of the Commanding Officer, Gunter Field, Montgomery, Ala.

No. 42-45926, type S-2, return address: Bell Aircraft Corporation, attention of Lieut. Col. W. M. Altenburg, Marietta, Ga.

No. 42-370649, notify Base Adjutant, Ephrata Army Air Base, Ephrata, Wash.

No. 42-432284, seat type, notify 1st Lieut. Howard S. Twichell, AAF Pilot School (Basic), Majors Field, Greenville, Tex.

FOUND:

No. 42-272874, seat type, shipped by mistake from A. W. Whitaker Co., Portland, Ore., to base Operations Office, Post Field, Fort Sill, Okla. This parachute bears the name of Carmello J. Milioto.

SECRETARY of War Stimson recently issued a letter to Aircraft Warning Service volunteers disclosing that the warning centers are to be closed and that the work, on a reduced scale, will be absorbed into installations used for the training of fighter pilots. Reduction of the service does not mean that the WD believes all danger of bombing is passed, he said, but the calculated risk in reducing defenses is justified by the offensive power released. Secretary Stimson praised the volunteers for their service and reminded them that the WD looks to them to maintain silence with respect to the many matters of national security which had come under their observation. The secretary said the war has much farther to go and he expressed hope that the volunteers will not relax their war efforts. He urged them to transfer to one of the many important jobs which remain to be done before victory.

AN 18-ounce olive drab serge field jacket, patterned after the British army battle dress, is being issued to American soldiers in the European theatre. The new garment is designed primarily for combat, but may also be worn for dress, taking the place of the enlisted men's olive drab coat. It has two outside breast pockets with flaps, and two inside breast pockets. It is designed with fly front and sleeves have an adjustable shirt-type closure. Waist is adjustable by side buckles and tabs.

☆

WHEREVER the GI goes, he takes with him something that is particularly American. At a base of the ATC's India-China Wing, the soldiers noticed that the native people did not have clothes enough to protect them from the chill nights. First they bought clothing for the native bearers who serve with the GIs. But that didn't satisfy the soldiers' inborn trait of sympathy for the poor. Staff Sgt. Joseph W. Wirth staged a fund raising campaign among the personnel of the base. Enough money was collected to buy 7,000 yards of cloth. Local Indian authorities said this cloth, distributed to the natives of nearby villages, would make 2,000 dhoties and sarees.

☆

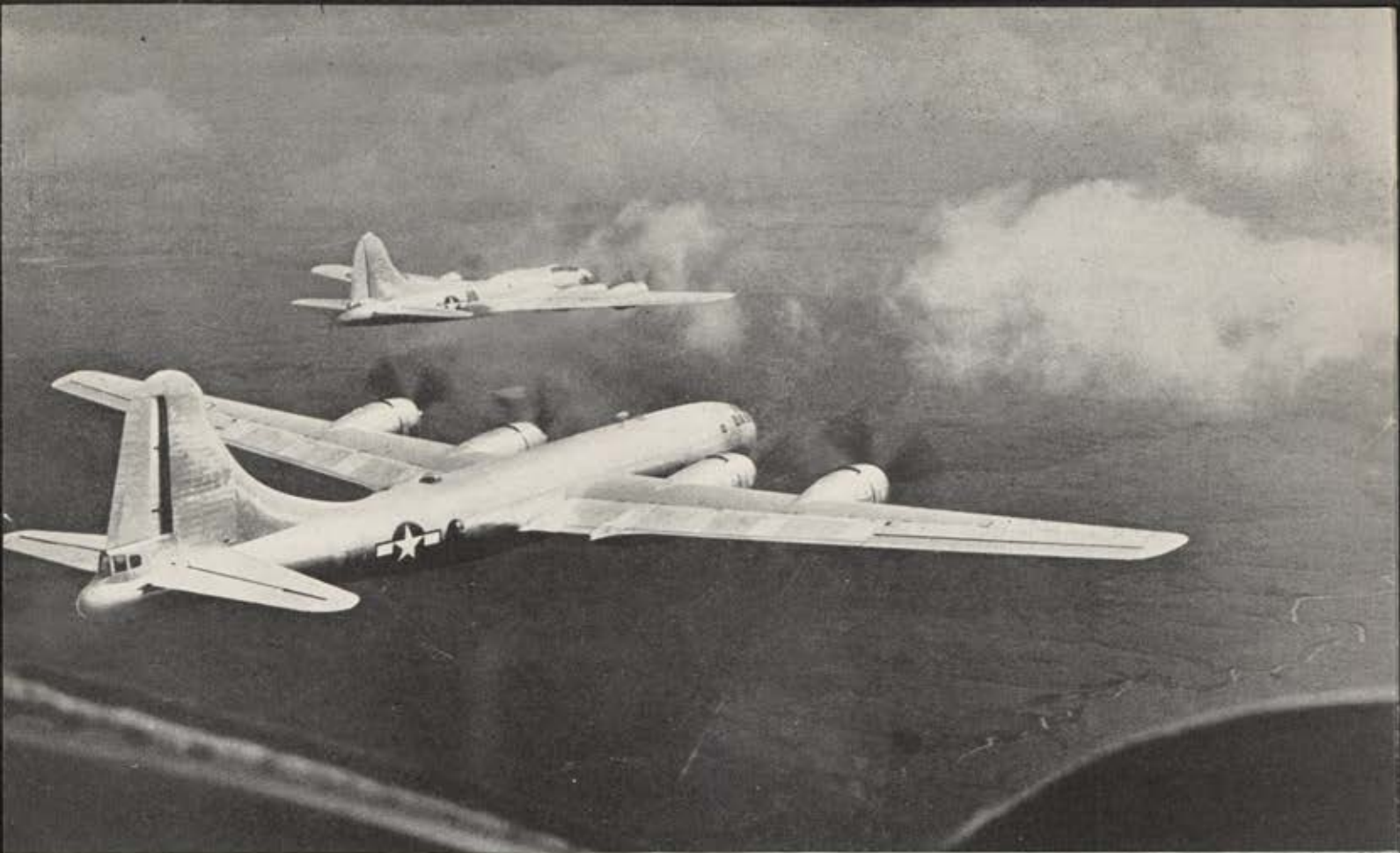
THERE is now a \$10 U. S. Savings Bond, Series E (called GI bond), authorized to be sold exclusively to military personnel at an issue price of \$7.50. The bonds may be purchased only by a \$7.50 pay deduction under Plan 12 of the Class B allotment system. Installment deductions are not authorized and, until further notice, the sale of the bonds is not authorized for cash, nor through the Personal Transfer system. They will not be sold to civilians.

☆

"ONE afternoon I met two nice boys from your airbase, but I didn't get their names," a 19-year-old Mitchell, S. D., girl wrote to the field newspaper at a South Dakota base. "One was called Nathan, because that is what the other boy called him," the miss continued. "One had dark, curly hair and the other had light brown hair, I believe. One was from Missouri and the other was from Kentucky or Tennessee. If somebody will read this letter out loud, maybe they will remember." (We have read it aloud twice, and still can't place that Nathan. The other guy was unmistakably Sack.)

☆

NOW in its third printing, Air Forces Airs, a collection of songs for the AAF, had sold 54,572 copies of the pocket edition and over 5,000 copies of the piano edition as of June 1. By now, the song books should be reaching post exchanges in the overseas theatres. The books are sold under Post Exchange Price Agreement No. F-340, and all royalties go to the Army Air Forces Aid Society.—THE EDITOR.



From bases constructed largely by those who have suffered most under the militant heel of the Japanese—Chinese farmers and laborers—B-29 Superfortresses of the 20th Bomber Command are striking now at the heart of the Jap war machine. On July 7, our B-29s attacked naval installations at

Sasebo and industrial targets at Yawata, both on the enemy's home island of Kyushu. Yawata's steel plants also were struck on June 15. More than 350,000 Chinese, hundreds of whom are shown in the photo below, helped pave the way for these attacks by completing the necessary airfields in three months.



THIS IS SUICIDE CIRCLE



Keep clear of propellers!