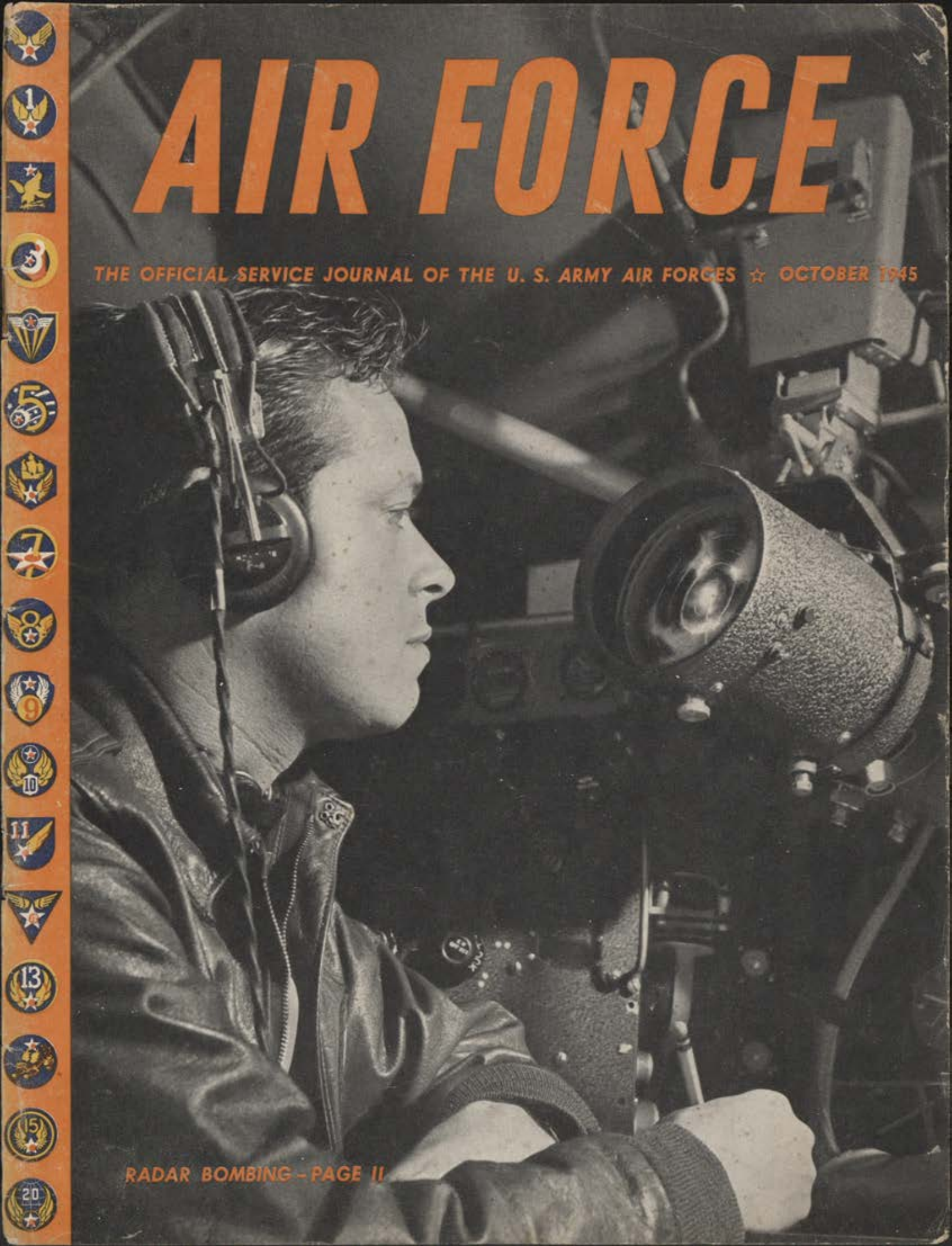
AIR FORCE

THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES ☆ OCTOBER 1945



RADAR BOMBING – PAGE 11

Honorable Discharge

BY CAPT. WM. T. LENT
AIR FORCE Staff

"Why yes, his records seemed to be in order."

"Well, well, if it ain't old Ironpants."

"I'll bet your mother will be surprised when she sees what I brought her."

"You might say I look for improved team play this season, with the influx of some air-commando veterans."

Rendezvous

High-Speed Strafing

Dear Editor:

In reading your article "Shock Waves at 600 MPH" in the February issue of AIR FORCE I was reminded of several combat experiences which members of my squadron have had with high-speed dives.

I was the commanding officer of the 528th Fighter Squadron stationed at Tinghawk Sakan, Burma, during the Myitkyina Campaign. We flew A-36s, and P-51As and Bs. Most of our work was air coordination. AA encountered was normally small caliber ground fire. Occasionally we would meet 40 or 20 mm AA. Nearly always this was on field "beat ups."

We had a minimum strafing speed of 350 mph on air coordination targets. Of course this was not always obtained, but during every briefing the pilots were reminded to keep above this minimum. All planes hit by AA while strafing were, to my knowledge, flying slower than 350 mph.

When going on a beat up of an enemy airfield where the AA was either unknown or known to be heavy, we briefed to come in at least 15,000 feet above the ground and spiral down steeply (not split ess) in a 180-degree turn to strafe our targets. At about 30 miles from the target we would start a shallow dive from 20,000 or 25,000 feet increasing our throttle and RPM settings to maximum cruise. The formation was echeloned to the inside of the turn we planned to make over the field. When within AA range we started our turn and steep spiral, straightening out to strafe approximately 2,000 yards from the target. At the start of this spiral we usually indicated 350 to 400 mph and picked up another 100 mph when we dropped our plane's noses in the spiral. Normally we indicated 500 plus in our strafing pass.

The squadron SOP for this maneuver was to keep the left hand working the trim tabs enough to keep the stick pressure light, with only slight tail heavy pressure during the latter part of the spiral. At the start of the mission we turned on our cockpit defrosters to prevent canopy fog.

In the spiral the planes had a tendency to yaw from side to side. We believed this was the gas in the fuselage tank which was building up on the side of the tank due to inaccurate trimming—at least that was the explanation we gave ourselves. There never was any difficulty in recovering on the deck from the dive.

One such trip found four of us in P-51Bs over Mandalay at 26,000 feet indicated. We looked over the field at Anisakan, meanwhile circling to 23,000 feet. We then headed west in a steep dive turning slightly to the south. At about 8,000 feet we had completed a 90-degree turn and were indicating 500 mph. We increased our rate of turn until we headed toward the field. I had been playing my throttle but now put it at maximum cruise. At this time I was indicating 550 mph. The four of us were approximately abreast but the Number 3

(Continued on Page 2)

Vol. 28 No. 10 October 1945

AIR FORCE

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

DEPARTMENTS AND FEATURES

Authorization—AIR FORCE (formerly the Air Forces News Letter) is printed monthly by authority of AAF Reg. 5-6A (24 Jan. 1945) under the immediate supervision and jurisdiction of the Chief of Air Staff, Headquarters, AAF, and with approval of the Bureau of the Budget, Executive Office of the President.

Publication—AIR FORCE is published by the U. S. Army Air Forces at the AIR FORCE Editorial Office, 52 Broadway, New York 4, N. Y., U. S. A. Director and Editor: Lt. Col. James H. Straubel, AC.

Communication—Direct communication with the AIR FORCE Editorial Office is authorized on editorial and distribution matters. Address: AIR FORCE Editorial Office, 52 Broadway, New York 4, N. Y.; telephone HAnover 2-5200; teletype No. NY-1-2782. Washington office at Hqs. AAF, Washington, D. C. (telephone Republic 6700, Ext. 74562). Branch office at Wright Field, Dayton, Ohio (telephone Kenmore 7111, Ext. 29135).

Participation—AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Readers are encouraged to submit articles, short subjects, photographs, art work. All contributions will be given consideration; suggestions and criticisms are welcomed. Opinions expressed by individual contributors do not necessarily reflect the official attitude of the Army Air Forces or of the War Department. Material appearing in AIR FORCE is not to be reproduced without written permission.

Distribution—AIR FORCE is distributed in bulk shipments on a pro-rated basis to all units of the Army Air Forces throughout the world, in the United States according to the provisions of AAF Letter 5-14 (24 October 1944), and overseas in accordance with theater policy. In addition, personal copies of AIR FORCE may be purchased by military personnel and civilians from the Superintendent of Documents; single copies 20 cents, annual subscription (12 monthly issues) $2.00, the same rates applying to APO and Fleet Post Office addresses. Orders should be placed in writing and remittances made to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Copies will not be mailed until remittances are made; postage stamps and foreign money are not acceptable.

☆ U. S. GOVERNMENT PRINTING OFFICE—658316—PRINTED IN U. S. A.

man passed me as we recovered on the deck. Later he said he was indicating 600 mph.

No buffetting was felt on this mission; however, this may be partially explained by the fact that we had removed the bomb racks.

Another mission over Lashio airport was an experimental high altitude dive bombing run. We peeled off at about 18,000 feet. At approximately 10,000 feet I released my bombs and started a recovery at 500 mph indicated. I found it necessary to yell and strain my stomach in order to prevent "blacking out." I also found the plane pitching up and down. With very little back pressure it would create a sharp increase in positive Gs. When I relaxed on the back pressure, the plane would create a slight negative G. Several other pilots noticed this. We attribute this to the burbling over the wings caused by the arms for the installation of Rocket Launcher M-10 fastened to the wings. . . .

While the AA fire was not heavy around most of our targets in Burma, we did lose planes by ground fire. On all of our missions over airfields and other targets comparatively heavily defended by AA, we never had a plane punctured by an enemy bullet when we used our high-speed technique. The squadron later moved to China where I left it. However, I have learned that the same tactics were employed there against heavy AA with comparable results.

Lt. Col. John C. Habecker,
Headquarters, AAF.

Added Credit

Dear Editor:

I like your magazine but I want to protest an article in the June, 1945 issue—"Drop on Corregidor." You gave credit to the 3rd Attack Group, or Grim Reapers, as the A-20s who covered the landing of paratroopers and bombed the rock. I believe if you'll check the records more closely you'll find that the A-20s on that list of operations were the 417th Bomb Group Sky Lancers. My information should be correct. I'm a member of the Sky Lancers.

S/Sgt. Ben Butler,
Philippine Islands.

The records show that, in addition to the 3rd Attack Group, the 417th and the 312th bomb groups were in on this job with their A-20s.—Ed.

Slow Trigger

Dear Editor:

For a perfect illustration of how NOT to handle a .45, commend me to the back cover of your July issue. Why does your model have to use two hands, and why isn't he cocking the gun? A pistol should be carried with the barrel loaded and the ham-

How Sharp are YOU?

No hardstand for this 15th Air Force bomber on a Dalmatian island, but plenty of good detail in the photo to test your mental mirror. Look at the picture for a full 60 seconds, remembering as many details as you can, then turn to Page 43 for a list of 10 questions. With 10 for each correct answer, a score of 70 is fair, 80 good, 90 excellent, 100 sharp as a tack.

HOW SHARP ARE YOU? . . . . . Turn to Page 43

mer down, taking advantage of the built-in safety design of the firing pin. When in the field in 1918, I used to be able to drop a handkerchief from shoulder height with my left hand, draw from a closed holster and fire two shots before it touched the ground. . . .

Capt. Richard Douglas,
Army Service Forces.

Our ordnance informant tells us that, when the thong is not used, it is necessary to hold the holster when drawing—and that removal of the thong is common practice for all but mounted troops to avoid restriction of blood circulation in the leg. He agrees, however, that the model should be cocking the pistol. In this he and we stand corrected.—Ed.

A Record?

Dear Editor:

In the matter of unit awards, the 316th Troop Carrier Group has been fortunate enough to receive three Distinguished Unit Citations and nine campaign stars for service in the ETO.

I am frequently asked by our personnel how that record stacks up with other AAF units. It will be very much appreciated if you can help us determine any units which have equalled or surpassed our record.

Maj. Andrew J. Milstead,
Pope Field, Ft. Bragg, N. C.

Anybody top this?—Ed.

Hats Off Department

Dear Editor:

Your story in the August issue, "Blanket of Fire" by Col. Roy R. Brischetto, 5th Fighter Command, is very timely and interesting. However, why not allow just one paragraph to those in the minority who have been so helpful to the AAF in its incendiary missions in both the ETO and Pacific, the men who mix the jell and fill the fire bombs, the boys of the Chemical Warfare Service?

Capt. Francis T. Boyle,
Westover Field, Mass.

Dear Editor:

Someone—and I guess it will have to be me—should recommend your investigation of a thing called MATS, Mediterranean Air Transport Service. It didn't drop any atomic bombs or offer airline hostess service, but it took an ill-assorted lot of people and airplanes and did a terrific job in the Mediterranean when the job needed badly to be done.

MATS never bothered with public relations, unfortunately, and its story has been overshadowed by all the great events to which it contributed.

Time after time, Air Transport Command has been given credit for work done in the Mediterranean Theater by MATS—for the inauguration of Mediterranean air routes, for the "blood run" to the Anzio beachhead, for the air priorities setup. I'm proud of the Army's Air Transport Command, too, as every American should be, but because I was one of the MATS's orphans, I'm a little jealous of its publicity.

MATS pioneered North African, Sicilian and Italian transport routes and did it with

(Continued on Page 36)

In This Issue

Looking into the PPI scope aboard a B-29 in this month's front cover is Capt. John C. Mays, a radar-navigation specialist, whose experience with radar sets dates back to 1942 in the days of the defensive strikes by the 19th Bombardment Group from Australia. Captain Mays had been a navigator with the 435th Squadron when the B-17 outfit was shoved out of Java by the onrushing Japs. Then from Australia, and later from Port Moresby, Captain Mays' outfit began flying sea-search missions using the first ASV (Air-to-Surface Vessel) radar sets in the Southwest Pacific theater.

Training in the use of the sets was strictly on-the-job business. A few enlisted men who had accompanied the equipment from the States installed the sets in the planes and showed the navigators on the airstrip how to operate them. The finer points of using the equipment had to be picked up by the navigators in flight. ASV-equipped B-17s would go out on long search missions and, as soon as an enemy convoy was spotted, they would send back reports to guide other 17s with bombs to the prospective target.

After his return to the States, Captain Mays lectured on navigation in the 2nd Air Force, attended AAF Radar School at Boca Raton, Fla., and began a tour of duty in the Radiation Laboratories at Massachusetts Institute of Technology where he has continued to work on experimental radar bombing and navigation. (See "Radar Bombing," Page 11.) In January of this year, Captain Mays flew to South America with some experimental high resolution radar equipment to run tests to determine its reaction to atmosphere with high moisture content. The cover photo was taken by T/Sgt. Roger Coster, AIR FORCE staff photographer.

☆

When it became apparent that the Japs were on the verge of folding, we alerted our overseas staff members to rush us notes on the reaction of AAF men in their theaters to the end of the war—when it came. Well, the day—and the reaction—came rather spasmodically. Lt. Col. James H. Straubel, editor of AIR FORCE, who was on Okinawa at the time, cabled that his sector went wild on receipt of the first word that the Japs had offered to surrender. That was August 10. It was the same at Guam and in Chungking. At Far East Air Forces headquarters in Manila, however, the boys didn't start their big noise until more than 24 hours later, when Washington announced conditional acceptance of the Jap surrender offer, according to Maj. Ben Grant, officer-in-charge of our Far East Branch. From Europe, Capt. Tom Siler reported that most of the AAF personnel in Paris and London waited until the formal surrender announcement on August 14 (Washington time) before really cutting loose. The same was true of New York and Washington and San Francisco and intermediate points in the States. As these reports from all over the world reached our home office in New York, they were put together by Capt. John C. Jay, and the net result, "This Was It," begins on Page 4.

☆

One of the many candid cameramen who swarmed around the airfield on Ie Shima August 19, snapping pictures of the glum Japanese emissaries on their way to Manila to discuss surrender terms, was Sgt. Norman L. Pratt of the 4th Aircraft Maintenance Unit (Floating), several of whose snapshots appear on Page 44. A set of Sergeant Pratt's Ie Shima photos was forwarded by plane to AIR FORCE by his CO, Capt. Kenneth F. Knox.

☆

Although "Long Legs," Page 16, was written by Maj. Milton R. Krims of the AIR FORCE Overseas Staff several weeks before the Jap surrender, it tells of a job by men and planes that will live in memories and histories of the Pacific air war long after much of the spectacular detail of the moment is forgotten. It is a story of the long-range fighters, the pilots who flew those monotonous, over-water missions of 16 or more hours' duration to perform a much-needed escort job or shoot up vital targets not suited for the bombers. For much research and material furnished for the article, Major Krims and AIR FORCE are indebted to Capt. Bob Wistrand of 5th Fighter Command and S/Sgt. Barney Sauve of 13th Fighter Command. Our thanks, too, to Maj. Gen. Paul B. Wurtsmith, commanding general of the 13th Air Force; Brig. Gen. Frederick H. Smith, Jr., commanding general of the 5th Fighter Command, and Lt. Col. J. A. Johnson of A-3, headquarters, Far East Air Forces, for their advice and assistance in the preparation of the article. ☆

NEW ADDRESS

The AIR FORCE Editorial Office is now located at 52 Broadway, New York 4, N. Y. All communications on matters of editorial content and distribution of AIR FORCE should be directed to that address.

Telephone: HAnover 2-5200 **Teletype: NY-1-2782**


THIS

On Okinawa there was shooting; in Paris there was dancing in the streets. Around the world the celebration varied but to AAF men everywhere news of the Japanese surrender meant the glorious climax of a job well done

WAS IT

By Air Force Overseas Staff Correspondents

The red alert sounded on Okinawa Shima at approximately 2200 hours on August 10—the same wailing call that had been warning AAF men to hit the dirt all along the line for more than three and a half years, from Moresby and Saipan to Dutch Harbor and Hengyang and Leyte.

But this time the big searchlights were dark and the heavy ack-ack guns failed to pound out their usual welcome. Only the smaller guns were firing, and their crackle sounded like a Fourth of July gone mad. The night sky was alive with bright orange tracer streaks and star shell flares and puffs of light flak.

No enemy aircraft were over Okinawa on this night. The enemy was washed up—beaten before the final round. The radio had announced the Japs' offer to surrender, and while it wasn't official yet, the suddenness of the announcement had touched off a wild celebration that had the whole island in an uproar. Officers and EMs fired .45s and carbines into the sky. AA men pressed the triggers of their 40-mms and held them until the gun barrels were red hot. It was mad hilarity that took the lives of six men and wounded at least 30 before it ended.

But the celebration was premature. Radio announcements had clearly stated that the war was not yet over, and that the Jap surrender proposals had a string attached to them. Yet to the men on Okinawa the string didn't seem very strong, and pulling strings was someone else's job. The Nip was through and the whole business was going to be over and the mileage across the Pacific from Okinawa to the Golden Gate had suddenly shrunk to ferryboat size.

The climax was unprecedented. For the first time in history a major power had fallen without the traditional storming of his citadel by land or sea. Japan had decided to call it quits before being invaded. Undoubtedly the threat of impending invasion and the Allied amphibious advances of the past year had contributed greatly to the enemy's decision. But in the final analysis it was land-based airpower that had been the driving force throughout the Pacific war, and it was the atomic bomb dropped by the AAF that had provided the coup de grace. The men of Okinawa knew this and everyone felt proud inside.

Some of the men on the island who were cut off from outside communications took the alert and shooting for what they appeared to be. They concluded that the Japs had landed paratroops or airborne infantry on the Okinawa airstrips, as they had done a couple of months before. Only two nights previously, the Nips had been over the island on recco and to drop some bombs. The stage appeared set for a major effort to interfere with the vast military program on Okinawa, where bulldozers and trucks and steam shovels were putting the finishing touches on the world's largest airbase and where the AAF was bringing together its units from all over the world for the final push. But finally they learned that the last round had been called off and that the fight was over. To all intents and purposes, the war ended for the men on Okinawa on the night of August 10.

It was virtually the same story that night wherever AAF personnel were stationed throughout the Pacific; the first rumors of a Jap surrender offer touched off spontaneous celebrations that flared up quickest and loudest from those who were closest to the fighting. On Guam the news was greeted with an unrestrained night-long demonstration of joy. Aircrews of the B-29s shouted and pounded each other on the back; Wacs wept with happiness; bottles of hoarded whisky suddenly materialized from nowhere and added to the jubilation. Few AAF men doubted that the United States would accept Japan's offer. "Thank God, there'll be no more bombing missions" was the general feeling.

In Chungking, the first premature flash set scores of firecrackers popping in the narrow streets, their explosive rattle mingling with shouts of "Ding Hao!", as grinning Chinese saluted AAF personnel celebrating what looked like the end of the war. To China it meant the finish of a 14-year struggle. To GIs it meant just one thing—home.

When the first unofficial bulletins hit Manila, guys just sat around and stared at each other with a feeling of frustration. For lack of a better way to blow off steam, officers gathered at the Officers' Club, drank Filipino gin and got noisy. Night clubs in Manila filled up. Soldiers went up and down the streets, shouting, singing and laughing; every now and then someone would fire a .45 into the air as if to get something out of his system. But most of the men sweated it out by the radio, waiting for official word.

General George C. Kenney, commanding general of the Far East Air Forces, tried hard that night to get some definite word on the surrender. After sitting up most of the evening trying the radio, he is said to have called A-2 in the early morning hours. They didn't have a thing. He called A-3. Nothing there. In desperation he flashed the operator; "Give me a cook; maybe he'll know something."

"Yes sir," replied the operator. "What cook, sir?"

"Any damned cook!" the general stormed.

The whole thing was fantastic. No one had expected the Japs to give up so quickly, certainly not without some retaliation for the atomic bomb. On Okinawa, only a few

nights before, all AAF personnel had been called out for gas drill and gas masks, protective covering and ointments were carefully checked. It had been a week of news and rumor. Biggest sensation, of course had been "the bomb." Mess halls, latrines, jeeps and airstrips buzzed with gossip about the atomic job the B-29s from the Marianas had let loose. Early reluctance to believe in its reported make-up changed to frank amazement as confirming reports piled in. Aircrews returned to Okinawa from missions over Japan with tales of seeing a smoke column whirling 40,000 feet into the air above Hiroshima. "Most amazing thing I ever saw," said the aircrews, and ground men were convinced.

Then Russia entered the war and they knew it was clear now that the Nip was on the ropes. Next came rumors of peace feelers—through Russia, through Switzerland, through everyplace from the White House to the local latrine; still few people actually expected that the Japs would toss in the imperial towel just two days later.

It was still unofficial, however; the enemy had only offered us a conditional surrender, and the war went on while the diplomats dickered. Saturday, August 11, was

"An officer struggled with a wheezy old pump organ to render 'The Star Spangled Banner'."

just another day of work. In Manila, it was business as usual. Okinawa kept up its air offensive against shipping. Only Guam declared a truce and held its B-29s idle for further word. At 0100 Sunday morning Manila time, Secretary of State Byrnes announced Allied acceptance of the Japanese offer provided the emperor would be subject to our orders. Most of the world settled back to wait for the Jap reply, but to the war-weary AAF men in the Philippines, this was it. Boat whistles moaned in Manila Harbor; searchlight beams stabbed the sky; from the tent area at the Fort McKinley headquarters of the Far East Air Forces came the throaty roar of massed men's voices.

But once again the celebration was premature, and the war dragged on in a spluttering uncertain fashion like a damp string of firecrackers. While the wheels of international protocol ground on, flyers took off from Okinawa on missions against a foe who might have surrendered by the time they reached his shores. On August 12, when diplomatic negotiations for peace were at their height, a Jap plane scored a direct hit on the battleship Pennsylvania with an aerial torpedo and killed 20 of her crew. The next day 20 enemy fighters came up to attack a flight of P-47s on a sweep over Korea; 18 of the Nips returned to the ground—in flames, one was shot up on the ground, and the twentieth was listed as a "probable."

On Guam, where an unofficial truce had been declared, the hours ticked by into days. An ominous feeling of tension spread over the island like a thunderhead. B-29 crews stayed by radios, their ships grounded until Washington or Tokyo made up their minds. Even the garrulous Domei Radio had been silent for over 24 hours. It began to look as if the Jap was up to one of his old tricks, stalling for time. On the morning of August 14 word went around that if no answer had come in by 1730, operational missions were to be resumed. It looked as if the war was on again.

At 1420 Col. Carl R. Storrie, CO of the 314 Bombardment Wing, called in his men for briefing. He told them their target for the night: Kumagaya, a small industrial city of 49,000. No one showed the slightest signs of enthusiasm; it was like telling the winning team to go out and play the last game over again.

The planes remained on the ground until the last possible minute, waiting for the word that never came. Finally they took off at 1807 and headed into the dark skies. Radio operators maintained a constant alert for the code message "Utah, Utah, Utah," which would mean that it was all over. It never came, and 0132 hours on Wednesday morning, August 15, one more Jap city took a beating.

Sgt. Herbert C. Verry, radio operator on the last Superfortress believed to have dropped bombs on Japan, commented: "I think all the radio operators were more intent on this mission than on any other. They told us a code message might be coming over, and I was on the receiver until the last moment, even while we were over the target."

By the time the planes had returned, it was over.

AAF personnel in the States got the big news shortly after 1900, Washington time, on the 14th when President Truman announced to the world that Japan had agreed to accept the Allied surrender terms. From Times Square to the Golden Gate, air force men joined in celebrations.

In London, cheering GIs and girls paraded around Picadilly Circus carrying American flags. AAF personnel in Paris got the news at midnight and within a few minutes soldiers and Wacs in one billeting area poured onto the parade grounds and began snake-dancing around a huge bonfire that was being fed with signs reading "Officers Only," "Wac Area" and "Males Keep Out." A motorized cavalcade of Wacs and enlisted men took over the city's main boulevards, six vehicles abreast, and the strains of "Pack Up Your Troubles in Your Old Kit Bag" echoed through the streets. The driver of one jeep, on which 27

(Continued on Page 46)

ATOMIC STRIKE

Great billows of smoke and debris rise 20,000 feet as Hiroshima becomes history's first victim of an atomic bomb on August 5. Later reconnaissance photos showed the city approximately 60 percent destroyed.

← Circle Represents Maximum Damage Area, Radius 1¾ miles

This was Hiroshima before a single B-29 dropped one bomb by parachute over the city. There were streets, buildings, factories, houses and people. The aiming point of the bombardier is shown in the lower left.

A reconnaissance plane took this picture on the day the bomb was dropped. Clouds of smoke continued to obscure target for several days. The first atomic bomb had a blast effect equal to 20,000 tons of TNT.

Most of Hiroshima was dust when smoke cleared and flames died down days later. Tens of thousands of people were killed in the explosion. Another atomic bomb fell on Nagasaki before Japan surrendered.

OUR POWER TO DESTROY WAR

BY GENERAL OF THE ARMY H. H. ARNOLD

Commanding General, Army Air Forces

Today we must look to the future. We have come victorious through the greatest war of all time. It was not a war which we sought, or for which we were ready, so not unnaturally we faced moments of great danger and deep discouragement. With enormous effort and at heavy cost we surmounted them. This is a proud and jubilant moment, but let us not forget that it is also a fateful moment. Today, in the hour of triumph when it is only human nature to be affected by sentiments of relief, optimism and hope or wishful thinking, we must make decisions on which will depend to a great degree the permanence of peace, the fate of our country, and perhaps even the existence of human civilization. Our wartime responsibilities were heavy, but none of them was heavier than this responsibility that comes with peace.

From certain typical bases on the accompanying map have been indicated comparative ranges of effective air offensive action. Areas inclosed in the solid black lines can be dominated from the respective bases by airpower in terms of planes operational today—specifically, the B-29s. The broken line around the Aleutians base indicates the relative extreme range of the B-17 and the B-24, now obsolescent—and you can see why.

With planes of the range of the B-17 and the B-24 we knocked out German airpower and enabled our ground-sea-air team to conquer Germany. With planes of the operational range of the B-29 we were able to bring about the surrender of Japan. For any consideration of the future it is vitally important that we understand exactly how that surrender was brought about.

I am not referring now to Who Won the War.

No one arm, no one service, no one of the United Nations could or would claim the credit for what everyone must now realize was a vast and well-coordinated joint effort. It took, working together, all arms of the U. S. services, all services of our fighting, cooperating Allies, and the enormous industrial powers of the United States.

Nevertheless the decisive part played by airpower in the defeat of Japan without the necessity for an invasion of the home islands can scarcely be disregarded. A modern industrial nation such as Japan would not have admitted defeat at this stage of the war unless her industrial potential had been hopelessly weakened, the morale of her people seriously affected, and her isolation from the essentials necessary to wage war rendered virtually complete by blockade and the destruction of her navy and merchant fleet. The fanatical Japanese would never have offered to accept the crushing terms of the Potsdam ultimatum merely because the odds against them rendered "victory" of any sort impossible. The Japanese Army, although it had been hurt, was still a powerful force capable of inflicting heavy casualties on an invading force. The Kamikaze Corps had shown its capabilities in the Philippines and Okinawa campaigns and was preparing for an even greater effort against an invading amphibious force. Yet the Japanese acknowledged defeat because air attacks, both actual and potential, had made possible the destruction of the enemy's capability and will for further resistance. It had long been thought that it might be possible to bring about the defeat of Japan by air attack and blockade without the necessity of invasion, but war planners could never rely on victory without invasion. Though unprecedented in the history of warfare, this is what happened.

The destructive effects and increasing power of incendiary attacks on urban industrial areas, and high explosive attacks on critical war industries, principally the oil industry and the aviation industry, were principal factors in breaking the Japanese will and ability to fight. A long series of air battles drove the Japanese air forces, for all practical purposes, out of the skies, not only in the vast controlled areas, but over the homeland itself. Over the homeland, the Japanese were compelled to forego the defense of vital targets and yield air supremacy in an endeavor to recover enough to complete its destruction in a suicide role against an invading force. The destruction of the Japanese Navy was completed. The Army Air Forces shared with surface craft, Naval Air and submarines in the sinking of nearly 600 Japanese combat vessels. Aircraft are officially credited with sinking more than 2,000,000 tons of Japanese merchant shipping, of 1,000 tons and over, although in this respect submarines are primarily responsible for the reduction of the operational merchant fleet of a once great maritime power to substantially less than 1,000,000 tons.

Finally, there is the air contribution to the blockade and strangulation of the home islands. With the destruction of the Japanese Navy and the immobilization of the Japanese air forces, the U. S. and British land, sea and air forces completed the blockade of Japan. The sea-mining by B-29s immobilized hundreds of ships and sank dozens of others in the vital Shimonoseki Straits, and later coupled with aircraft and submarine attack, virtually cut off Korea and the mainland of Asia from the home islands through the mining of Korean and western Honshu ports.

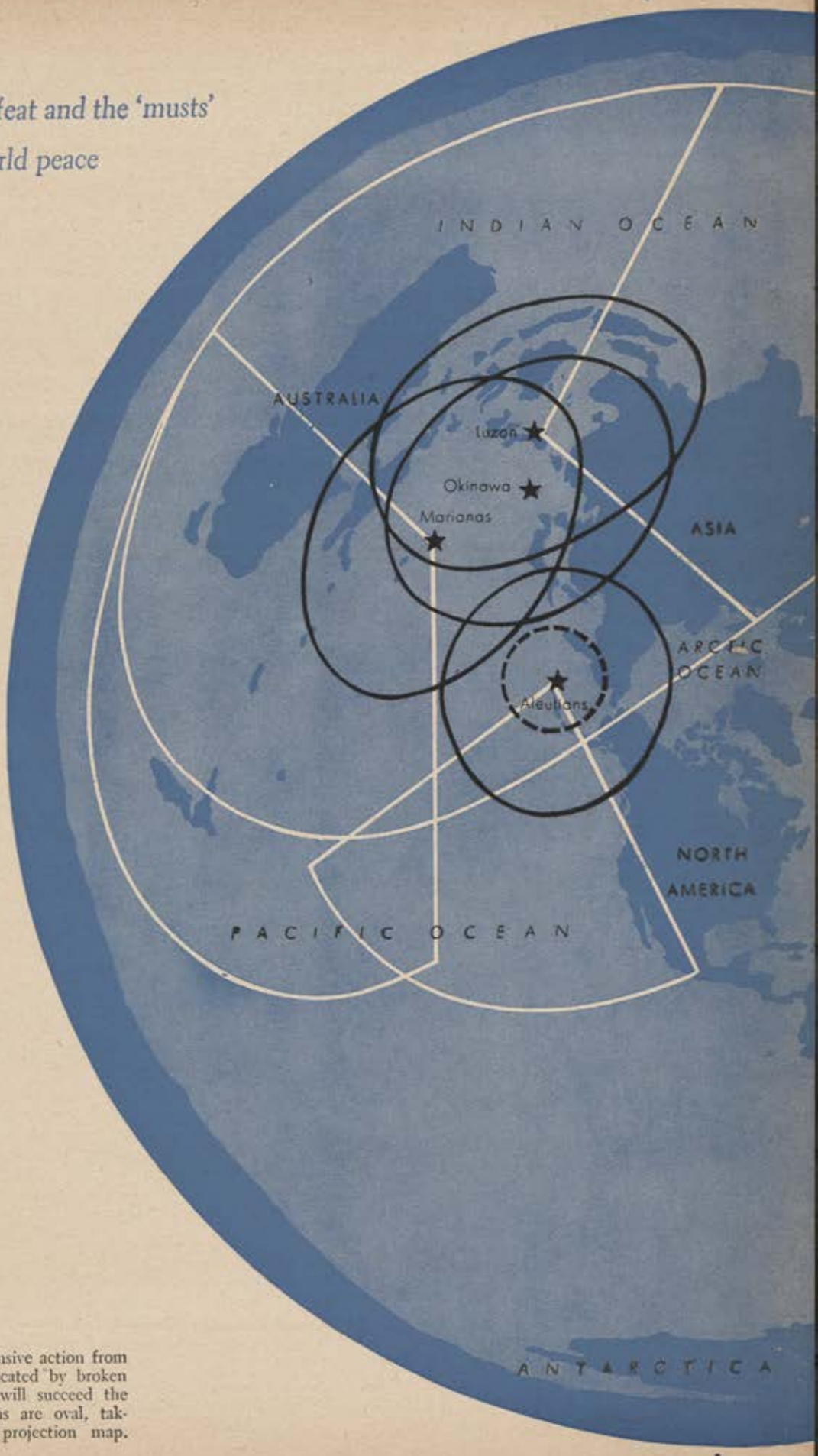
The collapse of Japan has vindicated the whole strategic concept of the offensive phase of the Pacific war. Viewed broadly and simply, that strategy was to advance airpower, both land and carrier-based, to the point where the full fury of crushing air attack could be loosed on Japan itself, with the possibility that it would bring about the defeat of Japan without invasion, and with the certainty that it would play an essential and vital role in preparation for and cooperation with, an invasion. The entire island-hopping

The strategy back of Japan's defeat and the 'musts' for airpower in maintaining world peace

campaign in the Southwest and Central Pacific had as one of its principal objectives the acquisition of airbases ever closer to, and finally within range of, Japan. These bases were also vital as Navy supply and mounting bases. They were essential in order to neutralize or knock out Japanese air strength, thus allowing the U. S. Navy as a whole, and particularly its offensive airpower, to be brought within range of the home islands themselves — something which would invite ruinous losses as long as Japanese land-based air strength remained full and effective. Finally, the bases enabled us to defeat every effort of the Japanese Army to stop the inevitable advance to the home islands in preparation for an invasion of Japan.

This, then, was how the surrender of the Japanese was brought about. I wished to stress it, because the harnessing of the atom and its dramatic use as the climax of this campaign has tended to overshadow a most important point When the atomic bomb was ready, we were in a position to deliver it, practically unopposed, to any point in Japan that we chose. The appalling effects of the delivery are shown in the Japanese Emperor's rescript announcing surrender.

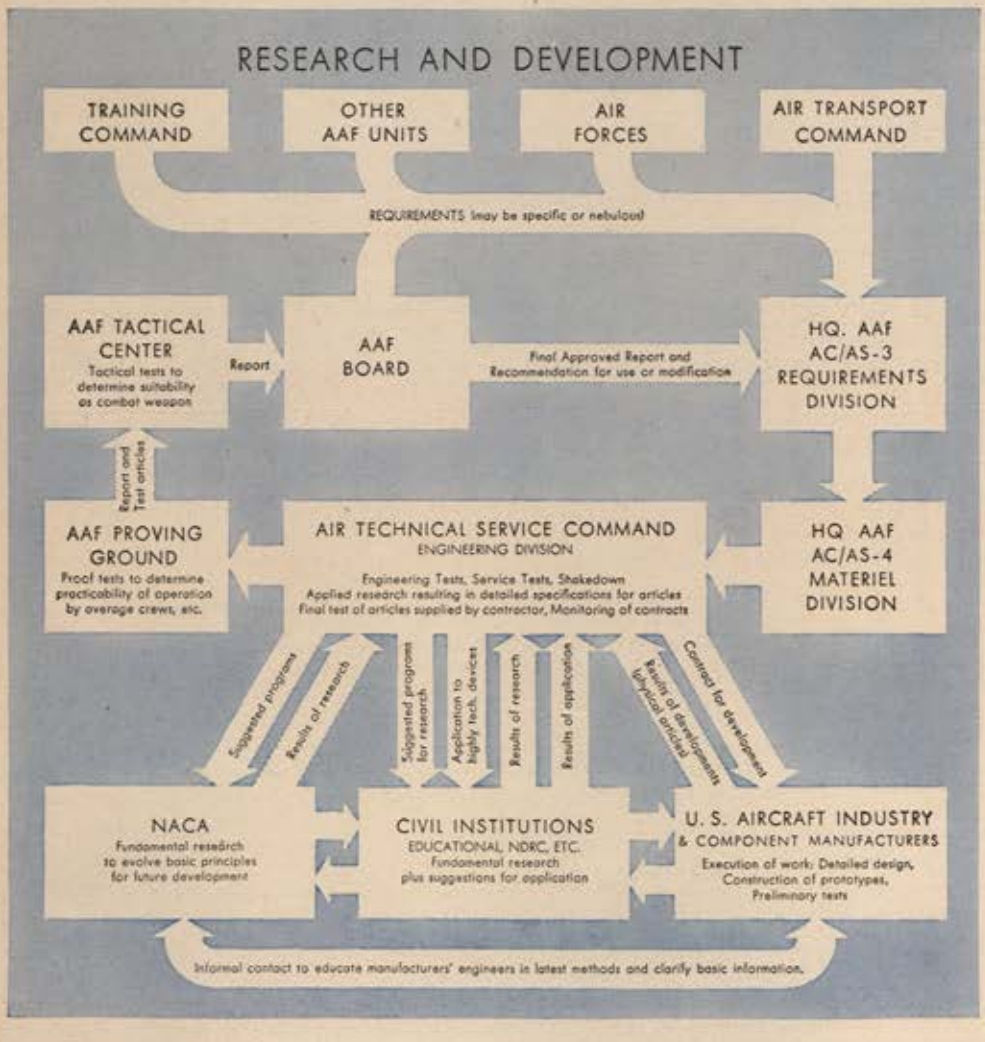
"Should we continue to



Comparative ranges of effective air offensive action from four typical bases: B-17s and B-24s indicated by broken line; B-29s by black lines; planes that will succeed the B-29s by white lines. Range indications are oval, taking into account distortion of polar projection map.

fight, it would . . . result in an ultimate collapse and obliteration of the Japanese nation."

This is true; but the Japanese situation was hopeless before that. There is reason to think that, from the Japanese standpoint, the atomic bomb was really a way out. Because the bomb was incredibly destructive, it was possible for the Emperor, without too much loss of face, to give up, as the only answer to this unheard-of development. The Japanese position was hopeless even before the first atomic bomb fell because the Japanese had lost control of their own air. They could not counter our air strikes, and so could not prevent the destruction of their cities and industries. They could not offer any effective opposition to the gathering of the immense forces of our land-sea-air team which was preparing to descend on their coasts.



These are the facts about the fall of Japan which we must keep in mind if we are to maintain the peace we have won at such cost. This is the lesson:

At no time in the foreseeable future can there be any security for a nation which, through ignorance, negligence or unpreparedness, allows itself to be put in that fatal position of Japan during the last year of this war.

There is also a lesson which you may be sure a future aggressor will take to heart. The greatest danger that any nation with a scheme for world domination faces is the United States. The last two wars have shown that no such scheme can possibly succeed as long as the United States is left free to throw in its unimpaired economic and military potential. Therefore, it will be necessary to dispose of the United States first, and, for the first time in history, disposing of the United States first may be practicable if we, at this fateful moment, make the wrong decisions.

Let us consider, in the light of weapons and techniques now available, or known soon to be available, what we may expect in a new war. On the accompanying map you see indicated by white lines the effective operating range of the airplanes that will succeed the B-29. What they will be succeeded by, we simply don't know, but we can be fairly certain about observable trends.

1. Manned or pilotless aircraft travelling at supersonic speeds. With such speeds aerial combat as we know it—fighters seeking out other fighters or bombers and exchanging gun fire in an attempt to shoot each other down—will disappear.

2. The extraordinary development of guided missiles and the refinement of their controls so that exact hits can be made on targets of a mile square or less, at any part of the world, from any part of the world.

3. Improved atomic bombs. They will be destructive beyond the wildest nightmares of the imagination—a weapon ideally suited to sudden unannounced attacks in which a country's major cities might be destroyed overnight by an ostensibly friendly power.

4. Great developments in the field of defense both against aircraft and against guided missiles by means of target-seeking antiaircraft missiles of rocket or other types. It will undoubtedly continue to be true that every new weapon of offense will eventually be countered by an at least partly effective means of defense. Against the supersonic planes and the highly developed guided missiles of the future it is probable that a defense in the form of missiles automatically seeking out those planes and missiles and destroying them or some of them, in the air, or the stratosphere, or the ionosphere, will be developed.

5. Perfected communications systems between air and ground making possible the most intricate maneuvers either by piloted planes or pilotless missiles.

6. An extraordinary development of the techniques of launching, landing and supplying airborne forces which can be dropped completely equipped at any point in the world in a matter of hours.

None of these things is visionary, or merely possible. They are probable to the point, almost, of inevitability. If we have another war—if another aggressor arises to strike the peace-loving nations, it will be with things like these that he strikes.

(Continued on Page 36)

radar bombing

How our electronic eyes removed the protective covering of clouds and darkness from the enemy's industrial cities and transportation centers

BY CHARLOTTE KNIGHT

AIR FORCE Staff

Pacific time, the day was August 9, 1945. And the weather was just what it had been on so many other B-29 missions for weeks—lousy.

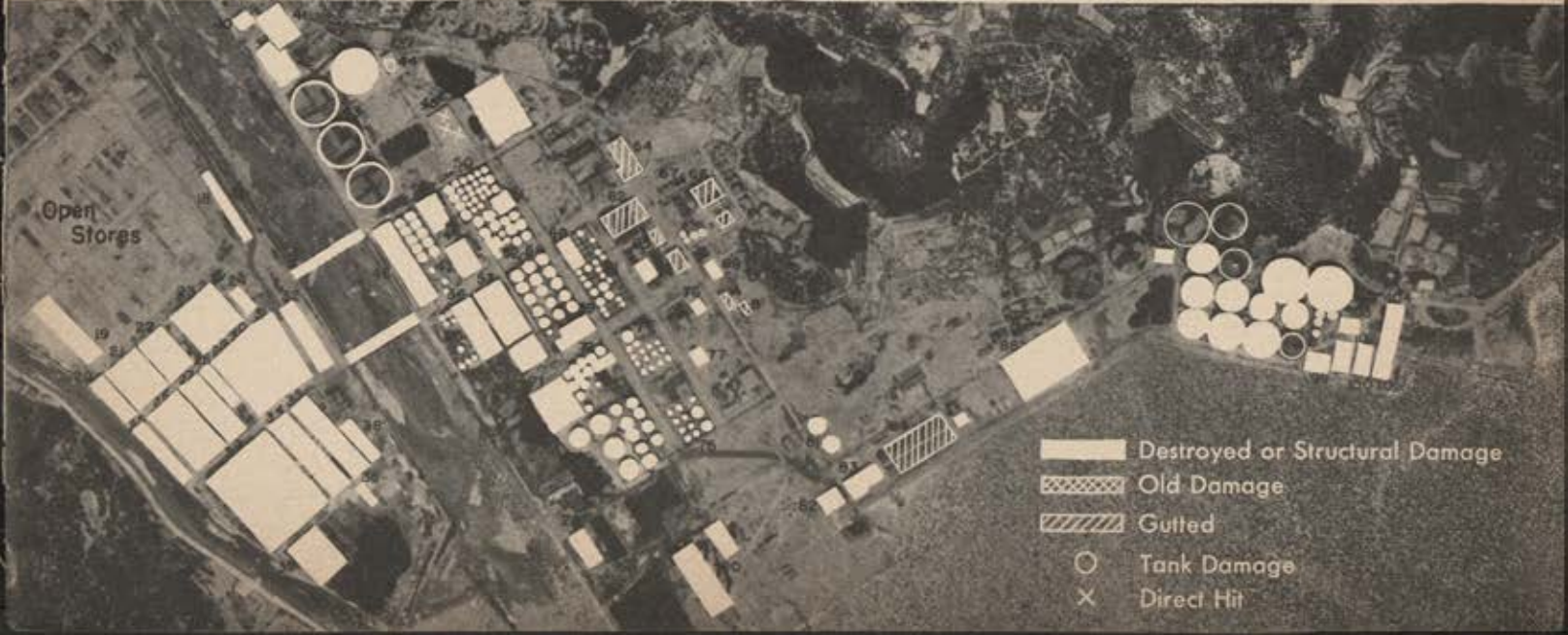
Capt. James F. Van Pelt, the radar navigator in the Superfort "Great Artiste," looked out his window and thought how nice it would be sometime again to see where the Sam Hill you were flying. He could still remember when he'd have been plenty worried about navigating a plane in weather like this. Now, except for getting bounced around a bit, it didn't make much difference. He had plenty of confidence in his radar, and, fortunately, so did the other crew members.

There had been a time when even he didn't go all out for all this radar stuff they were going to put in the new bombers—queer-shaped antennas and a lot of fancy black cabinets that promised to bounce a self-respecting DR navigator out of business. But that was before he started flying long over-water flights to Japan.

Since then, Captain Van Pelt and every other navigator of a B-29 had learned to depend on radar almost exclusively to get them to the target and back again, and their respect for the "devices" could be measured in direct proportion to the number of missions they had flown.

On this particular mission, the gadgets were getting their routine workout. As the plane neared the Japs' own front yard, Captain Van Pelt divided his attention between two radar scopes: on his left his long-range precision navigation set—LORAN—from which he could get periodic fixes from two powerful radar beacons based at strategic points along his course; and on his right his PPI (Plan Position Indicator) scope; an auxiliary "remote" scope showing the same

In the month before war's end, blind bombing in the Pacific reached an all-time high with 78.5 percent of all 20th Air Force bombs being dropped by radar. July also saw a new record for radar bombing accuracy when B-29s, equipped with improved high-resolution radar, in just two attacks destroyed 95 percent of Maruzen Refinery at Shomotsu. Damage assessment photo shows accuracy of strikes.



360-degree scanned "pictures" of the earth's surface below and operating in the same way as the parent scope on the radar operator's BTO (Bombing Through Overcast) equipment aft of the tunnel.

Both the radar operator, S/Sgt. Edward K. Buckley, and Captain Van Pelt sat with eyes glued to their respective PPIs looking for radar check points—such as islands, coastlines, lakes, rivers and bridges—which could be recognized easily on the scopes. From them the navigator could check and correct his position.

In spite of the weather, Captain Van Pelt guided the plane expertly to the primary target. It was socked in. This was to be a visual bombing and the pilot, Maj. Charles W. Sweeney, made three runs on the target hoping to get an opening before he gave up. Then he told the navigator, "Let's try for Nagasaki."

That whitish blob on the edge of the scope—that was Nagasaki. Once again, the navigator brought the B-29 "reflections" from the Mitsubishi plant, approached the bombing circle, Sergeant Buckley called to Captain Beahan:

"Get ready for seven zero degrees."

At the moment when the outer edge of the specific target touched the leading edge of the bombing circle, he called, "Now!" and the bombardier made adjustments.

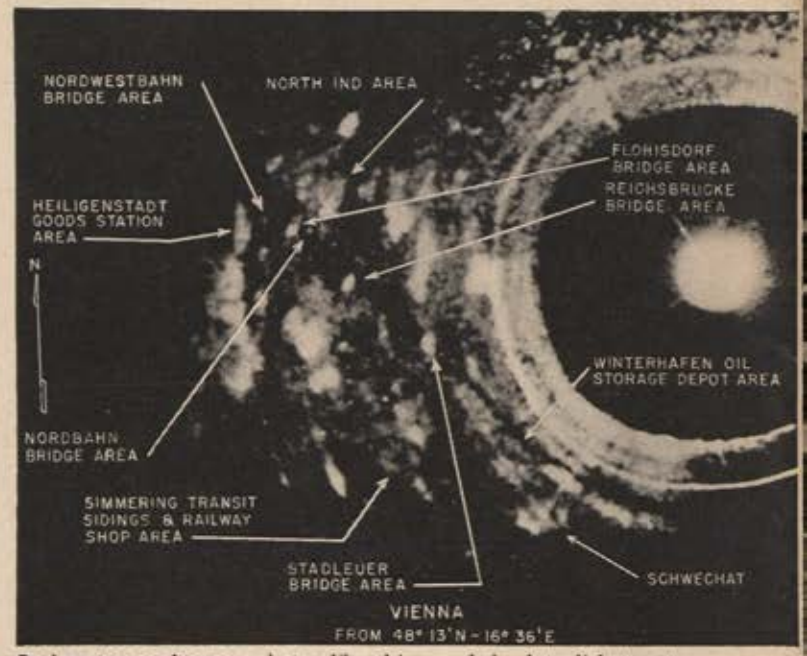
Captain Beahan kept his hand on the displacement knob. Sergeant Buckley called again, "Ready on six eight degrees . . . Now!" More often than not this procedure would have been repeated through each successive sighting angle until the point was reached where the bombs would be released automatically by the Norden sight.

But on this mission, just 30 seconds before bomb release, Captain Beahan sighted a tailor-made opening in the clouds.

"I see it," he called to Sergeant Buckley, getting a perfect "visual" on the target. He turned dials in swift last second corrections and then, "Bombs—." Remembering, he grinned and corrected his report: "Bomb Away!"

Irregular bright patch in PPI sketch at right shows how typical target might appear in radar scope set at 10-mile range. Straight white "Lubber Line" indicates true heading of plane toward target.

As bomber nears overcast target, white area on scope moves closer to bombing circle, in this case 2.4 ground miles from plane. When center of target reaches circle, order is given for bomb release.



Radar reconnaissance photos like this one helped to lick target identification problem. Thorough advance briefing enabled operators to translate otherwise meaningless spots into specific targets.

right onto it. They found the Kyushu port city also overcast but there was not enough gas left to scout around for a more likely spot, so directions were given to prepare to bomb anyway.

Sergeant Buckley switched his PPI from 50 to 20-mile range, thus "enlarging" the picture on the tube and bringing into higher resolution lights and shadows which his experienced eye translated into land and water, built-up areas, shipyards, factories and docks. Slowly, as the plane sped toward them, these blurred images moved nearer the scope's center representing at all times the position of the plane. The radar operator set his computers for the correct sighting angles and a "bombing circle" was turned on the scope at the exact slant-range setting.

Meanwhile, the bombardier, Capt. Kermit K. Beahan, had adjusted his Norden bombsight on the basis of the latest drift speed, altitude, and so on. At this point he could not see the target to get the sighting angle, so the radar operator who *could* see it—electronically—fed the data to the bombardier over the intercom; and as that irregular bright patch on the scope, interpreted as radar

And the second atomic bomb to be dropped on the enemy islands descended toward Nagasaki.

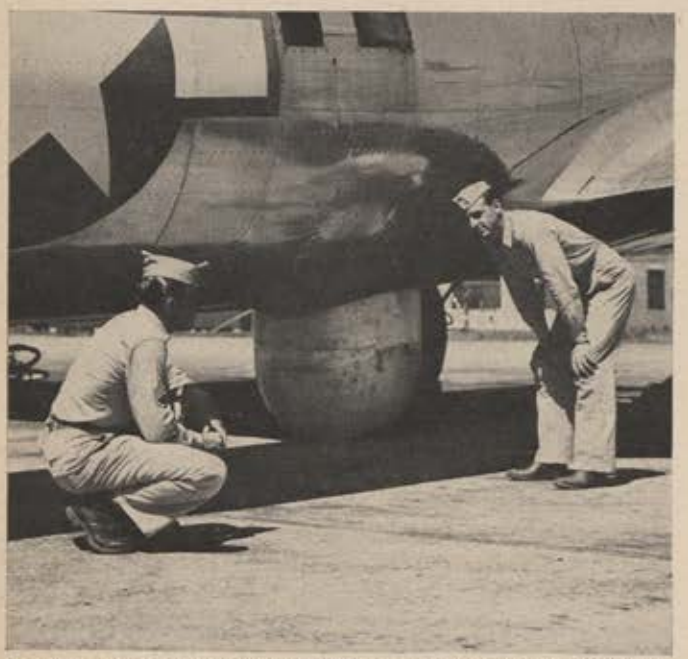
Except for the revolutionary character of the bomb load on the "Great Artiste," this Nagasaki mission was the rule and not the exception. Radar's tremendous role in the destruction and ultimate capitulation of Japan can now be measured partially in these figures: at least 70 percent of the bombing carried out by the very heavies was accomplished by radar in the coordinated radar-visual manner described above; complete radar bombing, including the actual release of bombs through solid overcast accounted for 50.6 percent of the bombs dropped from November through June, a period which included the good weather months over the Jap home islands. During July of this year, bombs dropped completely by radar during our great incendiary raids reached a high of 78.5 percent.

And this is but one part of the radar picture—the HAB (High Altitude Bombing) procedure using super-high frequency microwave BTO radar equipment in the 20th Air Force alone. If the LAB (Low Altitude Bombing) radar campaign against Jap shipping on the part of the 5th, 13th

and 14th Air Forces were taken into account, the percentages would be much higher. For instance, between those three air forces, more than half a million tons of Jap shipping were sent to the bottom by LAB radar operations alone in the first year of the equipment's use.

In a single month one B-24 squadron of the 14th sank 110,000 tons of enemy shipping in the China sea completely by radar.

But to get back to the 20th. Radar men feel that they have come a long way since that first shakedown mission over Bangkok on June 5, 1944. Lt. Col. K. M. Gonseth, a communications officer for the 20th Bomber Command, explains some of their early trials: "There had been such a rush to get the first Superforts to India that only a few arrived over there with radar equipment even installed. For the most part the sets, still in crates, had been hastily pushed aboard at the last moment. Radar operators fared almost as badly. Equipment had been so limited back in



Radar men examine a "radome," a familiar appendage on the AAF's heavy bombers. The radome houses the "spinner" or parabolic antenna used to transmit radar waves and receive returning "echoes."

the States that most of these boys had had practically no scope training in actual flight.

"Once they arrived in India, ground radar mechanics did a magnificent job of installation and servicing; in spite of excessive duty hours and adverse working conditions, they kept sets in superb working order. We set up training programs at bases in both India and China, and sent our radar operators along on the long gasoline-hauling missions over the Hump so they could train on scopes enroute. When the Bangkok mission was laid on, we still didn't feel that we were ready but at least we were a little better than when we left Kansas."

The results of that first raid did not make the 58th Bomb Wing (Very Heavy) very happy. Broadly speaking, only a small percentage of bombs landed near the target. If it did nothing else, the mission pointed up plenty of weaknesses, most of them boiling down to this: that radar operators simply had to get more training in scope interpretation before they could be counted on to identify targets with any reasonable degree of accuracy. Training was accelerated even more. Operators worked until they were scope-happy and gradually became more adept at picking out cities and plants from the mass of spots before their eyes.

And then from his China base at 1630 hours on June 15, Col. Leonard F. Harman pulled the first B-29 off the runway, barely cleared the trees and headed for Japan. About 74 other Superforts followed him. The target. the Imperial Iron and Steel Works at Yawata. It was already dark when the formation reached the China sea, but its islands made excellent radar check points and navigation on the mission was considered excellent. When they reached it, Yawata was blacked out and partially concealed beneath 5/10 cloud cover, so most of the bombs were dropped by the radar operator's own toggle-switch on the basis of scope identification entirely. Results again were not too good. More than a little damage resulted and it was conceded that some bombs *did* drop in the target area, but not many

This is probably as good a place as any to clear up a point or two concerning high altitude radar bombing by means of PPI pictures alone. It would be comforting to report that this most amazing of all radars would pick up the exact target desired and translate it onto the PPI in a flash reading: "This is the Kawasaki aircraft plant. Bomb here!" It's a long way from being that simple—yet. The equipment itself, while it was the best that could possibly have been developed in the time available, still did not have very good resolution. Consequently, it took a really skilled operator to interpret accurately the blurred land features on his PPI. At any rate any degree of precision required a good deal more practice than those early radar operators had had a chance to get. One operator summed it up this way: "Hell, we felt lucky if we could even spot the town, let alone find the specific target."

Finally, it must be remembered that these radar observers were flying over what was, for them, new territory. When the missions first started, there were no actual radar scope pictures to study, and the only advance indication they had of what would be likely to appear in their PPIs was to be found in an artist's drawings (based on maps and topographical studies) of what he thought would turn up in the scopes as planes flew over the target area. These preconceived drawings were excellent but they could scarcely take the place of the actual radar reconnaissance photographs which later were made of routes to IPs and targets.

Nobody was more aware of their weaknesses than the radar men themselves, and they proved just as anxious as their commanders to whip this target identification problem. They trained on the ground and they trained in the air—and kept right on training between missions. Supersonic trainers finally arrived from the States and these, by means of accurate terrain models of the area over which the bombing missions were to be flown, were capable of simulating actual scope presentations of what the radar operator would see in flight. These helped considerably.

"Offset" bombing was developed and this helped, too. This technique has often been compared to that used by a golfer who aims for the cup by sighting on the flag. Because specific targets, such as buildings, refineries, marshalling yards and the like seldom are easily discernible on the PPIs, the radar operator must pick as his offset aiming point some nearby point which does show up with clarity. By pre-determining the exact distance of this check-point from his unseen target, he can clock a time-delay from the AP to the actual bomb release point.

Sasebo, Manchuria, Palembang, Nagasaki, Tokyo—the raids were stepped up. And though the increased skill of the operators began to pay off in higher bombing accuracy, it was still a long way from pin-point. Radar is ideal for

(Continued on Page 56)

THIS IS YOUR ENEMY

. . . in the throes of defeat

"Endless throngs of worshipers came to the Plaza before the Imperial Palace. . . ."

BY MAJ. HARRY H. RANSOM
AIR FORCE Staff

"Finis" was written to the story of Japanese airpower in various ways. None was more telling than the conclusion scrawled by an AAF tech sergeant on Sunday, August 19. Winding up his assignment as a "631," whose daily job had been to provide his unit with air statistics on the enemy, he posted only one line that morning: "Jap Aircraft Operational—Two transports, white, with green crosses."

Like the statistics on Germany's surrender, however, the figures somehow got unhinged from reality. The fact was that Japan had ended the war with about 5,800 operational aircraft. Even after surrender, some of the JAAF and JNAF reserve of about 3,000 fighters attacked B-32s flying reconnaissance missions. Whole depots of Bakas were left, and whole squadrons of dispirited pilots sworn to suicide. V-weapons were in the making; plans and models for them had been bought from Hitler in March, much to the widely publicized disgust of their German inventors, whose profit from the exchange was meager. New Japanese air training programs had been scheduled for autumn, and Allied intelligence had scheduled technical releases on new equipment ranging from a Jap ME-163 to the unproved trainer, Hickory.

Although the Kamikaze program had been withered by the law of diminishing returns, Japanese air leaders livened their early August propaganda with final threats to sink whole fleets of Allied ships and chase "America's 20 air armadas" out of the Pacific sky.

Precisely what it was that unraveled surrender out of this tangled mass of brag, politics, fanaticism, mysticism and military power may be arguable for years. The easiest answer —and that given most often—is "one atomic bomb on Hiroshima and one atomic bomb on Nagasaki." In a sort of rise-and-fall of horror, the Japanese had described the missile as "a new weapon," "a searing explosive," "an atrocious, barbarous, beastly device," and "The Atomic Bomb."

But *Mainichi Shimbun*, which joined this horrified chorus, denied that Japan had surrendered to mere uranium. Nippon's cause had been lost for months, the editor explained. "This is not negotiated peace; it is one-sided defeat." *Yomiuri Hochi* took a similar but more subtle view, colored with wistful humility. Its editor reasoned that if one bomb or two bombs destroyed the golden prospect of Japan, note should be made of the scientific superiority which put conquest into so small a package. "It would be much to our good," he concluded, "to accuse ourselves of being so incapable."

Apart from dramatic emphasis on the atomic bomb, other immediate causes of defeat were cited, including the 20th Air Force's maddening latter-day custom of "calling its shots" before large-scale missions.

Whatever the immediate military causes of surrender may have been, Hirohito was the sole agent. For some days before Japanese newspaper or radio commentators suggested anything worse than hard times ahead, the nation's war conscience was focused in the Emperor. Gradually, like a Siamese cat cautiously pawing a shark's fin, the propagandists touched upon the possibility of surrender. "There is not a soul in Japan," declared one announcement, "who does not grieve in his present desire to do whatever he can to bring ease to the mind of His Majesty by quickly eliminating whatever may be troubling his Emperor." This exalted theme of pure sympathy between people and throne was occasionally punctuated with homelier details—pictures

of the Crown Prince, his daily schedule, appointment of his new tutor, accounts of his deep concern for the populace.

Then the unbelievable happened. As irreverent Americans put it, "The Emperor grabbed a mike." To the Japanese, his speech seemed the most moving threnody in their national history—which has never been conspicuous for its gaiety. "August 14 of the year 2605 of the Royal Calendar was a fatal day, a day of noble inspiration," intoned the official radio. "The Emperor spoke personally to 100,000,000 subjects. . . . Thus the destiny of the Japanese people is expressed in oneness with the Throne." This unity has been described with delicate emotion by the Emperor in such lines as "we shall be with one another always."

So the tempest that Japan had fatefully brewed on December 7, 1941, expired in a tea-cup. As if he were arranging cherry blossoms, Hirohito accepted the terms of Potsdam. "For the sake of civilization . . ." he declared. "Listen, listen to the August Wish of the Emperor," chimed in all propagandists. So the ritual went on and on, for days. Finally the fact emerged from the mist: Japan was done for.

Although Japan was done for, anybody who expected Hirohito's subjects to get out the family swords and knives or hug grenades to their bellies or go marching off into the sea soon learned better. "No nation has the right to commit suicide," proclaimed the headquarters of the Kamikaze Corps. The hours of pondering and capitulation which followed bore no resemblance to the swift and sinewy attacks on Pearl Harbor and the Philippines; the new government's announcements lacked that mad savagery that threatened to behead all enemies who came by air.

Nevertheless, this elaborate funeral ceremony, the lyrical business of the God-Emperor, very soon let in the noise of hard, fast, tough talk about Japan's destiny and how to attain it.

First hint of this new line came from *Mainichi Shimbun* and *Yomiuri Hochi*, both of which advised that in carrying out Hirohito's "August Wish," Japan should "keep free from all past entanglements and prejudices." Forthwith, this resounding theme of a new day coming was taken up by ministries, editors and many professional spokesmen of all stripes.

Finally they stared unblinking at the facts. The *Nippon Times* summarized conditions sharply: We need shelter, we need food, we need clothing. Food was no minor problem. Daily rations in some places had been cut to 300 grams of rice or the equivalent. Shelter, especially in the bombed cities, was badly needed. The capital noted encouragingly that 1,200 emergency dwellings were left over from the war program—houses of two rooms capable of putting a roof over 20 people.

The Japanese aircraft industry announced plans to convert to peaceful production. The Japanese air forces hopefully suggested that their uniforms could be converted to work clothes. *Sangyo Keizai* took this as symbolic—thus Japan shucks off war and puts on peace. "The foundation of a country, after all, is civilian strength," the editor explained, and did not wait for the ghost of Yamamoto to answer. To this generalization, however, he did add the suggestion that civilian livelihood be guaranteed. Other writers took up the chorus: Industry must be converted. Credits and debts must be adjusted. Inflation must be hedged by compulsory savings and taxes—although no immediate restrictions were laid on withdrawal of deposits. In this scheme of recovery the central figure was the Japanese farmer. Service groups of the air forces were immediately urged to get to work repairing farm machinery. Demilitarized communications units were assigned the job of rebuilding telephone lines. Japanese police, civil and military, gave less attention to "thought control" and more to the knotty problem of keeping evacuees from pouring back into destroyed cities.

All this reality was skillfully linked to former grandeur by Aikichiro Fujiyama, president of a Japanese economic federation. "We will doubtless return to the status of a small island empire," he declared, "but our spirit must shake itself free of provincialism and return to the magnanimity of the Kamiyo era." A colleague of shorter wind added simply, "The people must be encouraged to develop political sense."

For a day or two, political sense continued to smother itself in defeat. Endless throngs of worshipers came to the Plaza before the Imperial Palace and to the precinct of the Yasukini Shrine, dedicated to Japan's war dead. Former air defense officials wrote new equations of war value—the loss of Saipan and the damage done to the Grand Shrine of Ise, the loss of Iwo Jima and injury to the Meiji Shrine, the conquest of Okinawa and threat to the Imperial Palace from the air.

Among the most articulate Japanese to raise their voices in the midst of so much lamentation were the scientists. President Tada of the Board of Technology condemned any wishful thoughts about inventing a Japanese vengeance weapon to offset the atomic bomb. As an alternative, he suggested that all Japanese laboratories—air, ordnance, chemical—be devoted to a new science of living. Out of tune with the previous announcements, he prophesied "a great new religion and a new religious leader." Forthwith, his speech was canceled and its echoes drowned in the growing shouts of racial determinism. Dr. Tada's colleague, Dr. Hidetsugu Yagi, handed *Mainichi* a more specific plan for the future. Defeat, he reasoned, had come about through "jealousy, narrow-mindedness and domination cultivated during the feudal age." Relief from such a heritage could be expected only from men under 30 and from scientists first.

"Though Japan is disarmed, though her war machinery is dismantled, science can never be suppressed," he declared.

Education was also included in the exhortations to save Japan. In the name of the Minister, teachers were advised to devote themselves utterly to defense of the national structure. "Students should be determined to recover the national might from the scorched earth." The Imperial forces scattered on islands by-passed in the American sweep up the Pacific were reminded to keep first in their thoughts "the preservation of the everlasting foundation of Japan." Premier Prince Higashi-Kuni, dismissing the war with China in a casual allusion to that "Incident," predicted a New Social Order and, somewhat more smoothly than his colleagues, hinted that there need be no repetition of unhappy warfare if only the nations "would encourage each other in the development of Greater East Asia."

Mainichi Shimbun (by the same pen that had recently

(Continued on Page 56)

Long Legs

BY MAJ. MILTON R. KRIMS
AIR FORCE Overseas Staff

It seems almost a lifetime ago when Buna and Lae and Salamaua were still occupied by the Japs, when the few available B-17s and B-24s flew without fighter cover, when P-39s, P-40s and even P-38s strained to complete a three-hour combat mission.

In October of 1942, it seemed reasonable for the 5th Air Force to request a fast, high altitude, extremely maneuverable, well armored fighter with a safe combat radius of action of at least 600 miles. From Moresby, it was approximately 600 miles to Wewak and 600 miles to Rabaul, the two key targets in the still very young air war against Japan. It was also some 600 miles from Wewak to Rabaul. Here was the triangle pointed like a threatening—and to the Japs, irresistible—wedge at the Moresby toehold and at all Australia beyond.

Then Australian forces stopped the Japs on the south side of the Owen Stanley range, hardly more than 30 miles from Moresby, and later the 6th Army and the Aussies drove the Japs out of Buna. Meanwhile, the 5th Air Force continued to fly its heavies and mediums with a minimum of fighter cover, sometimes with none at all. Out of necessity, the 5th modified its planes and developed new techniques—package guns for the B-25s, skip bombing. But longer-range fighters were needed because the 5th knew a bomber without fighter escort is like a boxer with only one fist.

The idea was to isolate the Jap in New Guinea, cut off his lines of supply, neutralize, and then occupy at will if necessary. It meant our fighters as well as bombers would have to reach out to Wewak, Rabaul, Hollandia, Gloucester, Wakde, Biak, Noemfoor, Palau and other distant targets. General Kenney called it Air Blockade. The slogan—reputedly coined by General MacArthur—was Advance the Bomber Line. This was true air war at its best, the pattern for the march back to the Philippines.

The fighters strained but couldn't quite make Rabaul or Wewak. Vastly outnumbered in the air, they still beat the Japs every time they met. But their legs were too short. Yet Wewak needed to be neutralized before the war could proceed according to plan. So at Tsili Tsili, 200 miles northwest of Buna, in a spot accessible only by air, a base was scratched out of the kunai practically under the noses of the Japs. Now the fighters had a place to refuel. On August 17, 1943, a force of B-25s hit Wewak strips for the first time from low level—and they had fighter cover. The Japanese lost over 200 airplanes on the ground. Tsili Tsili was never used again after that one strike.

By November, 1943, fighter range had begun to increase. The P-39s stretched to a combat radius of 310 miles, the P-40s to 445 miles, the P-38s to 575 miles; new P-47s could manage 445 miles. But we were also closer to the enemy; we were in Dobodura, Nadzab, Lae. Most of the fighters had moved up, some into the Markham Valley as far as Gusap and Dumpu. There was fighter cover for the strikes against Rabaul and Wewak and all the targets within the triangle. In fact, the triangle had been crushed into a geometrical oddity. We were reaching out.

By the beginning of 1944, we were doing business from Gloucester. Rabaul had become nothing more than a

To win the air war in the Pacific meant conquering tremendous distances. Long before V-J day our P-38s were flying 11-hour missions and shooting down Japs 950 miles from base

problem in attrition. Even Wewak was no longer troublesome; it had never quite recovered from the August strikes. Incessant pounding by fighter-protected heavy and medium bombers had left Wewak numbed if not yet completely knocked out. Hollandia was next.

P-38s could reach Hollandia now, but the Japs didn't know it because our fighters had not flown closer than Tadji, 125 miles to the southeast. It was a case of deliberate deception and it paid off on March 31 when the 5th Air Force hit Hollandia with everything it had in the first daylight, fighter-protected strike on that target. The Japs must have gaped at the swarms of fighters that covered the successive waves of heavy, medium and light bombers. The surprise was complete.

That first strike practically eliminated the defenses of Hollandia. Successive attacks met little opposition and cleaned up what was left. When the landing was made April 22, the Navy's carrier-based aircraft met no opposition and the troops moved in standing up.

But something more than tactical surprise was playing havoc with the Japs. Something was happening to the fighter pilots themselves. The old, carefree days of instinctive, extravagant flying were over. Technical experts and test pilots—men with cold, analytical, bookkeeping minds—were teaching them new techniques. These men—among them Col. Charles A. Lindbergh and technical representatives, Joe Parker of Republic Aircraft and Frank Meyer of Lockheed—contributed new ideas, demanded a new kind of flying discipline. Fighter pilots learned how to fly according to a flight plan. They learned cruise control and the mathematics of gasoline consumption in relation to mileage, altitude and power settings. They learned new tactics, the self discipline of making one pass at enemy aircraft under certain fuel conditions, of not going downstairs to meet an enemy coming up, of going home if the enemy didn't come up soon enough. It was a tough transition for many a happy-go-lucky fighter pilot, certainly a minor revolution in his psychology of battle. But it was the beginning of the kind of thinking that made future results possible.

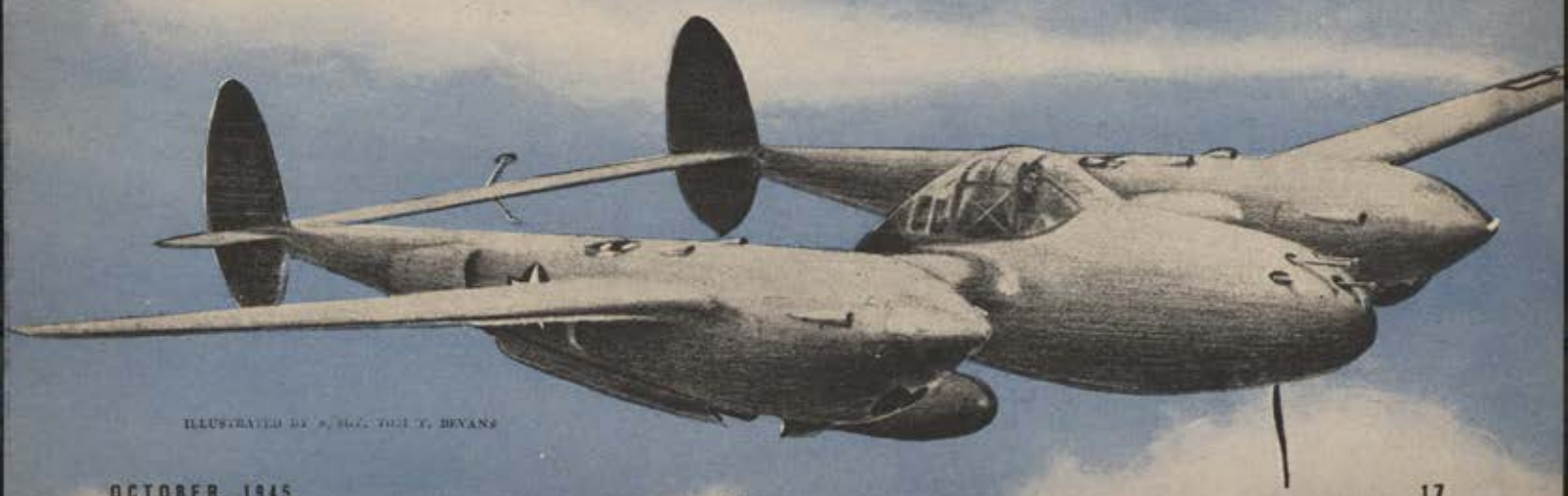
By late September, 1944, fighters in the Southwest Pacific were beginning to take really long strides. P-38s carrying 425 gallons of fuel in internal tanks and 330 gallons in external tanks, were capable of fighter sweeps and medium bomber escort missions up to 795 miles. By carrying the same amount of fuel and rendezvousing 50 miles short of the target, they were able to perform escort missions with heavy bombers up to 690 miles. The twin-boomed fighters, carrying one 1,000-pound belly bomb and fueled with one 165-gallon drop tank and 425 gallons in internal tanks, could make dive bombing missions up to 587 miles. With 425 gallons carried internally, the P-38 was capable of missions with two 1,000-pound wing bombs as far as 375 miles.

At the same time, the new P-47D28 could perform fighter sweeps and medium bomber escort missions of 690 miles when fueled with 370 gallons carried internally and 330 gallons carried externally. For heavy bomber escort, rendezvousing 50 miles short of the target and transporting the same amount of fuel, this fighter could make missions of 430 miles. For dive bombing, carrying one 1,000-pound belly bomb and two wing tanks, it was capable of 690 miles. With one wing tank and one bomb, it could make up to 518 miles; leaving off the external tank, it could pack two 1,000-pound wing bombs on missions up to 320 miles.

The P-39s and P-40s were virtually retired. Stateside factories were going all out producing new fighters, the designers benefiting by lessons learned in the combat areas.

With each passing month, the 5th Air Force grew greater in numbers and striking power. It was joined by the 13th—the Jungle Air Force—to form the Far East Air Forces. The Moresby-Wewak-Rabaul triangle had been broken into a series of little circles to be erased when time and material could be spared. The game of hop, skip and jump had moved into a bigger league; General MacArthur was getting set to return to the Philippines.

On September 2, a formation of 5th Air Force fighters made the first land-based sweep against the southern Philippines. They were joined by two fighters from the 13th Air Force. Equipped with detachable gas tanks, the fighters covered 1,400 miles in what was believed to have set a new over-water combat record for fighters. Lt. Glenn A. Starman destroyed a Jap fleet plane, the first shot down by an American fighter over the Archipelago since the fall of Bataan. They hit again September 6, strafing Mindanao targets, striking at airfields, coastal vessels and shore installa-



ILLUSTRATED BY S/SGT. TOM T. BEVANS

tions. Fighters of the 13th even shot down an enemy transport that somehow wandered into range.

The fighters began hitting the southern Celebes and Indo-China. They cut deeper into the Philippines. They were going wherever the bombers went—almost. And every day they found out something new about increasing range.

They learned new angles on the problems of gas consumption; they could estimate with reasonable accuracy how far it was possible to fly on gas from one belly tank at varying altitudes and speeds. They experimented with 310-gallon tanks, then with combinations of 165- and 310-gallon belly tanks. With these two tanks, the P-38s could load a little over 900 gallons of fuel.

Fighter Command statisticians, especially those of the 13th Air Force, made extensive studies of fuel consumption on long range missions and arrived at some basic conclusions. A recent report provides the following breakdown based on a P-38 carrying one 165-gallon and one 310-gallon tank:

1. At 2,000 rpm, 34 inches manifold pressure, auto lean at 170 mph, an average climb of 200 feet per minute can be maintained up to 10,000 feet. Average fuel consumption is 40 to 50 gallons per engine per hour.

2. At 2,000 rpm, 30 inches manifold pressure, automatic lean, altitude from 9,000 to 10,000 feet, an average indicated air speed of 190 mph can be maintained for the first two hours and increased thereafter to 195 mph as fuel is consumed. Average fuel consumption will be 35 to 40 gallons per hour per engine.

3. After dropping the 310-gallon empty tank, an increase of 5 to 6 mph can be obtained over these figures.

4. A total of 5½ to 6 hours' fuel supply is available in the drop tanks with engine settings at 2,000 rpm, 30 to 34 inches manifold pressure, auto lean.

5. Over the target, engines are maintained at 2,600 rpm and 34 inches manifold pressure, auto rich. On return from the target a setting of 1,680 rpm and 28 to 30 inches manifold pressure, auto lean, is maintained with an average indicated air speed of 190 to 200 mph.

6. The radius of action of the P-38 type aircraft using one 310-gallon drop tank and one 1,000-pound bomb is reduced to 800 miles.

Procedure for selecting tanks was carefully studied. It was found best to drop the belly tank first, then use the wing tanks, running them out evenly at one-hour alternate intervals. Experience showed most belly tanks don't feed well above 5,000 feet, thus limiting the first hour of flight to that altitude. Since flying at low altitude is always economical, the fighters so equipped delayed before climbing to altitude desired over the target as long as the tactical situation permitted. They preferred to reach altitude 10 to 15 minutes from the target.

They learned other things. For example, the 310-gallon drop tank had a tendency to sag when filled. Rechecking of all sway braces by mechanics just prior to takeoff made sure all were taut. Sometimes the tanks failed to release properly and hit the coolant and horizontal stabilizer. Pilots learned to maintain a 160 to 170 mph air speed, flying in a slightly nose-low position, wings level with no slide or skid. At the instant of release, they pulled the nose of the plane through the horizon, forcing the nose of the belly tank down away from the wing and catapulting it clear of wing and tail surfaces.

The fighter pilots seldom had been confronted with difficult navigational problems. But now they were expected to fly over water, rendezvous with bombers at some pinpoint in a seemingly limitless sea. It was one thing to locate a mountainous mainland, another to locate a coral reef somewhere, for example, between Palawan and Indo-China. Sometimes B-25s were used as navigators. But mostly the fighters flew on their own. Their pilots learned that navigation was not the problem they had anticipated. With courses and ETA set well in advance, they had little trouble reaching their targets and returning to their bases.

But long flights created another problem. Did you ever try sitting in your most comfortable chair continuously for seven or eight hours without falling asleep? You might as well have the room at your favorite temperature to make the picture complete. Of course you're wearing loose-fitting, comfortable clothing. Even so, you're bound to get restless, even with a good book, plenty of cigarettes and plenty of your favorite drink. Now throw away the arms of the chair, the book and the bottle, get the temperature up to about 110 degrees, shove a parachute pack and tightly-packed one-man life raft under your posterior, stare continuously at about 23 dials and almost as many gadgets. Give yourself navigation and cruise control problems on which your very life depends, watch continuously for enemy aircraft and shipping and, by the way, think of the target and what the enemy may do to you if you make a mistake. And don't forget to put on a Mae West, your pistol belt with the old .45, two canteens full of water, your jungle knife, jungle kit and first aid kit and wear GI boots so you can walk through the jungle if necessary. Now put on a radio head set for seven hours and never stop listening to screaming, howling static and piercing calls from radio stations. And be continuously alert for calls from your leaders or fellow pilots.

All this took stamina—and sometimes benzedrine. The air surgeons worried over the strained faces and taut nerves of returning pilots. More than anyone else, the medics marveled at the remarkable stamina of the pilots who seemed always to be ready to fly again after a very short rest. Some have been known to fly 32½ combat hours within four days.

In October, 1944, the B-24s of the Far East Air Forces started strategic missions against Balikpapan in Borneo. Flying without fighter cover, they ran into serious trouble with Jap fighters, and they lost airplanes. Obviously, to be successful the B-24s required fighter cover.

But the nearest base was Morotai, 800 miles from Balikpapan, and the strips there were dangerously short. Biak and Sansapor in New Guinea were even farther away. Fighter pilots discussed the problem and came up with a suggestion. They would take off from Biak and Sansapor, accompany the bombers to Balikpapan and then when they were out of gas, bail out into the sea. This was no Kamikaze, no Banzai suggestion; the pilots fully expected Catalinas and submarines to be around to fish them out of the drink. But it was a long chance and the offer was refused with thanks. Instead, the experts did a lot of pencil pushing, and finally decided that the fully loaded planes could take off from Morotai by using every inch of the strip.

On October 10, P-38s of the 49th Group left Biak for Morotai. There they were joined by P-47s of the 35th Fighter Group. Together they totaled 40 fighters. They were expected to make a 1,600-mile round trip to Balikpapan, up to then probably the longest single-seater fighter combat flight in history.

The fighters loaded up with two wing tanks full of gasoline in addition to their regular fuel load. The planes were pretty heavy when the ammo for the .50-caliber and 20-mm guns was added. Take-off times were staggered and one by one the pilots preflighted their planes until the air was full of the sounds of throbbing engines. Pilots and crewmen waited tensely for the first plane to get off. The pilot was Lt. John R. Young, subsequently killed in action. Poised

(Continued on Page 60)

ILLUSTRATED BY CAPT. NORMAN F. TODHUNTER

Three Years Below the Mast

The coral of Okinawa Shima was being blasted and shoveled, trucked and scraped into the world's largest airbase. Air strength was being concentrated from all over the globe for the final push. The 5th Air Force was completing its move from Luzon and Mindoro; the 13th was coming in from Leyte, Morotai, Borneo and Palawan; the 7th, an early arrival from the Marianas, was being reinforced by B-24 Snoopers from the 14th in China and A-26s from the 15th in Italy; B-29 service units from India and staff personnel from Great Britain were reforming the 8th Air Force; units from the 9th were enroute from France.

It was the AAF's Grand Central Station. Everywhere on the island there was feverish anxiety to get operational. Groups took off on missions 24 hours after arrival, bags still unpacked. They had men, planes, bombs, mess kits, bed rolls and slit trench latrines. Ships overcrowded the harbors;

troop carrier aircraft shuttled in and out with cargo and personnel; the ATC terminal loaded and unloaded its C-54s; courier L-5s, the jeeps and staff cars of the air, were as essential as the daily weather reports. There just wasn't enough room on the island for everybody, yet somehow there was.

The first major objective in the air campaign from Okinawa after air defense helped make the island secure was the severing of the Japanese supply line through Tsushima Strait off the southern tip of Korea. By mid-August the strait was handling only a trickle of the vital cargo the Jap had once shipped through from the Yellow Sea across the Sea of Japan to the homeland. The main portion of the job had been completed in the two weeks following the initial strikes against the strait on July 25.

If the occupation of Okinawa was the beginning of the end for Japan—and it later turned out to be—the air offensive against the strait was another decisive step toward that end. In those first two weeks the Jap lost approximately 110,000 tons of shipping in Tsushima Strait. The climax came on August 6 and 7 when a convoy of 19 vessels, consisting of four freighters, four transports, eight tanker-types and three escorts, attempted to run the blockade. Fifth Air Force B-25 attack bombers of the 38th and 345th Groups, working by day, and B-24 Snoopers of the 43rd Group, working the night shift, sank 14 of the 19 vessels in the convoy, damaged and chased the others ashore. The B-25s accounted for 12 of the ships, Snoopers the other two.

This action wasn't large scale stuff by Pacific standards. The convoys, five in all during the first two weeks of the campaign, consisted primarily of small freighters and tankers of 3,000 tons or less. But the Jap was frantic for supplies and shipping was his big bottleneck. Most of his remaining merchantmen already had been withdrawn to home ports. In the three previous months aircraft operating under the Far East Air Forces' organization had searched the seas hour after hour and found shipping targets conspicuous by their absence. The 19-ship convoy was the largest sighted in that entire period. It was a tip that the air blockade was paying off.

Severing of the strait was the latest step in the blockade. The 5th and 13th Air Forces already had squeezed the noose from Formosa south; B-29s from the Marianas had repeatedly mined important mainland ports; rail lines and bridges of the inner China network had been cut by aircraft of the 14th in China and the 5th and 7th from Okinawa; submarine activity and Third Fleet action augmented the campaign. One primary rail line in China had been made impotent by the air blockade around Fusan, Korea; the only other rail line was overtaxed and open to new threats by the Soviet Union's entrance into the Pacific war. Forced to depend primarily on the shrinking resources of his homeland, the Jap was being made ripe for the kill.

Just as the air blockade of Tsushima Strait could be considered only in relation to the campaign against Jap shipping of the last three years, the attacks that were chiefly responsible for its success could best be understood in terms of the planning and effort expended over that period.

The hulks of Jap ships settling to the bottom of Tsushima Strait in late July and early August were grim reminders of another day. Far to the south, left behind in the course of the war, the gaunt black hulk of a freighter continued to rock and roll at the mercy of the waves on a reef off Port Moresby. Her 11,000 tons wouldn't be counted in the tally of Jap shipping lost to air attack in this war. The old ship wasn't even Jap or of this war; she was German and she went down in World War I during a storm.

But the Jap wrecks off Korea and the German wreck off Moresby had this in common. They all had felt the effects of massed .50 caliber firepower coming from fast-flying aircraft skimming so low over the waves they had to pull up sharply on each bombing run to avoid striking the masts of the ships. The ships had been subjected to attack bombing. The reef off Moresby was the Pacific birthplace and practice field, the reef off Korea the latest proving ground.

It is 3,100 miles and three and a half years from Moresby to Korea as an air force flies in the southwest and western Pacific. Along those miles and throughout those years, Jap shipping has been sent to the bottom with monotonous regularity. (See "Smashing Jap Sea Lanes," July 1945 AIR FORCE.)

No other tactic has proven so effective against Japanese shipping as attack bombing at extremely low-level altitude. Just as airpower has made possible the overall strategy of General MacArthur in the Southwest Pacific, on-the-deck attack has been the primary weapon of that air effort. In every major landing operation from Lae to Luzon, excepting only Leyte, attack bombing has been chiefly responsible for knocking out the enemy's air force, isolating the battlefronts, sweeping the beaches clean for invasion and supporting those invasions. And as this method of attack has been employed day after day in the last three years, statistics have piled up to prove its economies. This is evident in bombing accuracy, relative firepower, self-protection, increased range, reconnaissance and flexibility of attack. General Kenney reports that over a long period, per 1,000 hours combat flying, attack bombers manned by properly trained crews have had the lowest casualty rate among air units under his command.

When bombers of the 5th Air Force began clearing the Tsushima Strait with deck-level shipping attacks, the precision of their tactics was the grand climax of experience dating back to the days of Port Moresby

To appreciate the effects of this technique on the psychology of battle one should see an attack outfit back at base after a good bombing show. There is nothing quite like it; even the fighter crowd can't approach these men in mental attitude. Back at base they are as cocky and arrogant as they are precise and disciplined on the bombing run. Month after month, they do their jobs at wave-top or tree-

top level, break in fast for surprise, turn on the full blast of their forward firing 50s, watch the bullets splatter the defenses, feel the bombs leave the bomb bay and the plane rise sharply, bank and roar from the target and gain altitude, then watch the smoke and flames and debris they have left below. Regardless of how many fast, fleeting moments of action are experienced, the reaction is always the same.

No form of flying provides the exhilaration of low flying. The universal liking among pilots of buzzing the field tells part of the story. Add to that buzzing experience the power of eight forward-firing machine guns and four 500-pound bombs, the coordinated effort that goes with low-level formation flying and synchronized attack and a target staring you full in the face. The spirit of the offensive is built into the fuselage. Self-confidence becomes contagious, runs from pilot to crew to ground men. A bomb run becomes a personal fight, as near as an airman can come to hand to hand combat. There is no cloud bank

between you and the enemy; you are right on his neck, close enough to thumb your nose in his face; most important, you can see the results of your efforts. It's a tough flying assignment, requiring maximum skill and precision work. It takes cocky flying, which sometimes breeds carelessness, but the careless die early and the cockiness matures into healthy self-confidence.

Confidence was sorely needed in the Southwest Pacific back in the early days when the American Air Force, disorganized and beaten, pushed out of the Philippines and Java, struggled to find strength for a comeback from Australia, knowing replacements would be delayed and then would come only in a trickle. The growing defeatist attitude was as much a threat as the Jap. After the forces had been regrouped under Generals Kenney and Whitehead, the latter now Commanding General of the 5th Air Force, the men soon found themselves thinking in terms of the offensive. Not long before, they had been unable to put up an adequate defense. The thinking was along the right line, but it needed tangible results to become a power.

General Kenney declares that the adoption of on-the-deck attack, with its immediate successes, instilled a spirit of offensive that dominated the comeback and the advances that followed.

The basic doctrine of attack was known as early as 1927. General Kenney, then a captain, concentrated on its employment, planned and flight-tested until, he says, "it made sense." In 1928 he was skipping bombs from low level on the range at Langley Field. In that period he wrote a manual on attack aviation doctrine.

The Southwest Pacific was a natural for attack aviation. Weather conditions put a limit on altitude flying, virtually forcing aircraft down to the deck. The large expanses of water offered a smooth surface for low flying. The Jap was located on island bases with set defenses. Plenty of undefended area surrounded each base, an enticing situation for attack bombers that depended so heavily on a surprise approach. The Jap was depending upon his water line of communications and shipping was a vulnerable target for the attack bomber.

General Kenney, an attack aviation man going to an attack aviation theater, came overseas with Maj. Bill Benn, who later became A-3 of Advon 5th Air Force. The two men talked attack bombardment all the way across. In the theater, Bill Benn wasted little time in applying the doctrine to combat. His original application was skip bombing. He worked on the technique—timing, altitude, speed, angle of approach, delayed fuzing — and then selected the harbor of Rabaul for the test. Lt. Robert Herring, now a lieutenant colonel and A-2 of the 308th Bombardment Wing, worked with Benn outlining enemy ack-ack positions, terrain features and radar installations in the Rabaul area. Only B-17s were available for the tests. They were entirely inadequate in forward firepower, lacking in maneuverability. Benn was forced to go in at night in an effort to offset these weaknesses. In three Rabaul missions the skip bombing B-17s, never more than six on any one mission, sank six Jap vessels.

There were many weaknesses, chief among them the lack of forward firepower. The B-25 was the only aircraft-type available for the attack technique. The 25 was ideal in many respects but had only one .50 caliber gun in the nose. Maj. "Pappy" Gunn went to work on the problem and made the original pilot model with eight nose guns—almost unheard of at the time. Problems of balance were worked out and Lt. Col. (now Maj. Gen.) Victor Bertandius took over and remodeled B-25s at Townsville, Australia, to secure the eight forward firing .50s and put the attack bomber on a production basis. Later models of the B-25 and the A-20 carried the nose guns.

Meanwhile the tactical idea prospered. Maj. Ed Larner, then commander of the 3d Attack Group's 90th Squadron, perfected the low-level attack technique until it became a science. The old German freighter on the reef at Moresby offered a natural practice target. Here the 3d Attack Group cut the ship to ribbons and blew it up with practice bombs until coordination, timing and discipline were achieved. The basis of the technique was attainment of complete surprise: the enemy shouldn't know of your presence or even your angle of approach until you were on him and he had felt your guns. Key to success was relative firepower, the ability to concentrate more fire on a target than could be leveled at the attacking aircraft from the target, and thus, in shipping strikes, to beat down the deck defense guns. The kill was administered by bombs released at a specific angle and from a specific distance, the bombs skipping into the side

(Continued on Page 57)

The 73rd Wing became a proving ground for new ideas on B-29 maintenance efficiency, and its accomplishments became blueprints for new Superfort units

First called "the Monstrosity," this crew stand was later made in the States on specifications of the sergeants who built it with parts of a sugar mill.

A business succeeds only when it shows a profit. In order to do that it must make its product available to the consumer at the lowest possible cost to itself. Some businesses—the automotive industry for example—insist on selling their products FOB factory. Others—such as breweries—are satisfied to pay cost of shipping to the consumer. The latter require well organized and economically operated transportation systems.

To be ruthlessly realistic, a bomber is part of a transportation system designed to deliver a product, bombs, to a consumer—the enemy. But contrary to commercial practice, the consumer not only doesn't intend to pay the shipping costs but even tries to prevent delivery. So the producer must pay all the costs until such a time as the investment returns the profits of a victorious peace and assurance of an American way of living.

In the Marianas-based 20th Air Force there were men who dedicated themselves to making that cost as low as possible. And they thought of the cost not only in terms of money but of human lives. They didn't like waste.

It all began with the capture of Saipan in June, 1944. It was the first of the Marianas group taken from the Japs and it was destined to become the home of the 73rd Wing, the first B-29 outfit of the former 21st Bomber Command to go to the Pacific. The 73rd was set up in the conventional manner; it was composed of several bomb groups, each with a companion service group and each containing within itself such services as dispensaries, photo labs, communication systems, transportation facilities and training aids. Based on the assumption that each group would be operating from its own airfield, this arrangement was perfectly logical since experience had taught the wisdom of providing each bomb group with everything it needed to exist independently.

"But on Saipan," said Brig. Gen. Emmett O'Donnell, commanding the 73rd Wing, "it was impossible to operate as originally planned without a tremendous waste of manpower and equipment. We couldn't have done it anyhow because we didn't have the room. You see, Saipan is only five miles wide and twenty miles long and the Wing was expected to operate from one field fitted tightly into one end of the island. Geography created a circumstance with which none of us had had any previous experience. It also created a great opportunity."

It was impossible for anyone to have exact knowledge of Saipan conditions until the Japs had been driven out. The 73rd Wing advance echelon, commanded by Col. Byron Brugge, deputy chief of staff for operations, arrived in August, one month after the island had been declared secure. Wing headquarters, still in the States, was almost immediately informed of the geographical problem. Naturally this information was passed on to higher authority,

BIG BUSINESS CAME TO SAIPAN

In the Build-up Shop mechanics added accessories to engines. Men grew expert at their work on this island production line.

At the Tear-down Shop, parts were removed from used engines that were being sent to the United States for fourth echelon repair. All other maintenance was accomplished on Saipan.

where it was quickly realized that the same geographical problem would exist on the other islands of the Marianas group soon to be occupied and it would therefore be necessary to establish a new maintenance doctrine at command level. Col. C. S. Irvine, later 21st Bomber Command deputy chief of staff for supply and maintenance, was given the task of formulating this new doctrine. Looking back, he said, "We picked the best ideas we could think of from every air force installation we'd ever heard of and added quite a few of our own to create a series of consolidations that resulted in what we think was a new kind of combat maintenance."

Because the 73rd was the first to arrive, it was the first to be confronted with the problems and the first to experiment with solutions. It became a proving ground for new ideas. The first consolidation, actually commenced in the States, was the merging of the maintenance function of the several service groups into two Service Centers—A and B. Then, step by step as the Bomber Command doctrine developed, Engine Build-up, Salvage and Reclamation, Maintenance Transportation and Servicing were taken away from the groups and raised to Wing level. Even Supply was placed under a single supply controller, also at Wing level. Consolidation eventually reached out to the dispensaries, the photo labs, the communication centers, the lead crew and replacement crew training schools.

Now for a look at the results of the 73rd's experiments. Disregarding chronological order, we'll start with Supply because that's where smooth and continuous maintenance really began.

At the outset, when the B-29 was a relatively new weapon, supply officers had little to go by to help them keep their bins properly stocked. Nor was it always possible to control what supplies there were. Many crew chiefs, out of necessity and loyalty to their own airplanes, established their own little hoards of vital parts. To insure proper planning and equitable distribution, the multiple supply depots were consolidated under one supply controller, Col. H. W. Shelmire, and all supplies were distributed between two warehouse areas.

Later, new groups forwarded their requisitions to the warehouse known to stock the item. If the warehouses were out of stock, the supply controller was so informed. Since all requisitions funneled through the office of the supply controller, it was possible to make the studies necessary for constructive planning.

In April, 11,230 items were ordered by means of 4,101 requisitions, 704 of these eventually going to the States. Later, within a 60-day period, there was no knowledge of a single airplane being prevented from flying a combat mission because of an unavailable part. To avoid the dreaded AOCP (airplane out of commission awaiting parts) inventory was made twice a week. And that was a big job when Supply alone stocked 22,475 items.

Many of the items found in the bins of the supply warehouses came from the Salvage and Reclamation Section. Salvage and Reclamation, originally a service group function, was taken from the groups and consolidated into one level section under the command of Maj. Harry C. Weber. Its work started the moment an airplane cracked up anywhere on or near the island. Crash crews stood by during all takeoffs and landings, and removed a crashed airplane from the runway as quickly as possible. Then the airplane was taken to Salvage and Reclamation area and stripped of every salvageable part. These were cleaned, divided into serviceable and reparable categories. Consolidation made it possible to keep one crew working on reclamation projects while another stood by with the crash equipment, something never before possible.

Did it pay? In March, this section turned over nearly $280,000 worth of serviceable and reparable parts to Service Centers. In April, the turnover was $230,000, these totals covering only items for which price lists were available. It also cut off and prepared four CFC center sections, two nose sections and two tail sections for the gunnery school. That was pretty big business.

Consolidation created another big business, the Combat Maintenance Transportation and Servicing Section. Lt. Col. G. L. Hewitt, Jr., the CO, covered the size of it when he said, "We own every vehicle in the outfit." That meant some 2,600 vehicles of all types and sizes. They came from every unit in the organization.

Transportation had always been a problem; everyone complained about not having enough vehicles to meet normal requirements. But consolidation proved this to be a fallacy. The consolidated transportation section managed to keep all the vehicles moving. Sometimes its methods were rather drastic; jeeps, for example, were no longer assigned to individuals on a 24-hour basis except to personnel who presented a letter request proving they were so needed. And only a few requests were granted.

First and second echelon repairs were taken care of by the motor pools still located in the group areas. For third echelon work a new system of maintenance pools was set up. There were four such strategically located pools. Each had a roster of 32 enlisted men and one officer and once again consolidation provided men to do the job. Success was indicated by figures; in the month of April vehicles from this section covered 1,021,362 miles, used 95,214 gallons of gasoline and a proportionate amount of lubricating oil. Its gasoline trucks delivered over 9,000,000 gallons of gasoline to combat airplanes. It kept over 600 ground generating units functioning, the daily average out of commission never exceeding 20. Since inception of this system, the percentage of vehicles out of commission averaged between one-and-a-half and two percent.

The transportation section also was in the manufacturing business. Back in October of 1944 W/O Alexander John Drozynski, at that time assistant group engineer, and Sgt. Archie A. Harrison, a crew chief, started worrying about how they were going to service the B-29s. The plane was larger than any other combat aircraft and very few sections could be reached by mechanics standing on the ground. And the OEL stand which was regular issue was too shaky and provided no freedom of movement. Drozynski and Harrison got an idea and set about to develop it on their own time. They worked nights and days off to build a crew chief stand made to the measurements of a B-29. Using nothing but salvaged material, they finally created a stand 21 feet long, 16½ feet wide and 8 feet high. Even after modification it weighed 6,100 pounds. The two men were ribbed unmercifully, and their dreamchild was called "The

Monstrosity." But it worked; mechanics could run up and down the steps with loaded arms, could get around and under the engines with complete freedom and safety.

General O'Donnell looked it over, decided it had possibilities, gave Colonel Hewitt the job of manufacturing the stand on a production basis. The most difficult problem was to build up a stock pile before going into production. That problem was solved by the fortunes of war. Steel plates and angle irons came from the remains of a Jap sugar mill, frames were built from the tracks of a Jap narrow gauge railroad. Wheels came from wrecked amphtracs and bolts from anywhere, even abandoned ammunition boxes. A regular production line was set up in what was left of a Jap building. The men came from the service groups and had to be completely trained. But within a month they were turning out one stand a day—and it cost the government nothing more than the price of lumber, paint and nails. At first the bomb groups wanted no part of these huge stands, but within a short time they could not be manufactured fast enough to meet the demand. Specifications were sent to Wright Field which immediately let contracts for 120 stands a month to be delivered on a short deadline product basis.

The moment anything happened to a B-29, Salvage & Reclamation pulled the aircraft into their area and stripped it of every available part. Crews stood by for all take-offs and landings.

The first consolidation created Service Center A and Service Center B out of the four service groups. Some of the men gave them the collective name of "Willow Creep." But any organization that covered almost 150,000,000 square feet of floor space with some 40 warehouses, almost 60 shops, a variety of administration buildings, several parachute towers and a couple of service aprons wasn't exactly a "creep." When it used over 700 men and more than 150,000 hours a month it was breaking into a run. And when in spite of an almost 30 percent increase in business it cut down average plane repair time from 10 days to 3.8 days it began to gallop.

All of this was the good fruit of consolidation. Pooling of personnel and equipment saved space and cut paper work in half. Most important was the almost complete utilization of personnel and equipment. Because the problem of maintenance personnel was always critical, a mechanic needed to be a jack of all trades; under the consolidation he could be and usually was a specialist working at the job he knew best. And instead of these specialists being divided among different groups they were brought together in one shop. There were always times when the shops of one bomb group were temporarily idle while those of another were temporarily rushed. With the consolidation all work was distributed equally and usually completed twice as rapidly.

Prop shop, machine shop, sheet metal shop, instrument shop, all the other shops that did their share of keeping airplanes flying were doing a community job and enjoying it. Morale was unusually high because men were doing jobs they knew and were given a chance to finish. And they had the equipment with which to do their jobs because instead of being either hoarded or wasted, it was brought to where it was most needed.

Experience had proven fourth echelon repair to be impractical in a forward area. Therefore used engines had to be shipped to the States for overhaul. It was the removal of accessories from these engines and their replacement on new engines that had made engine change such a slow and tedious job. The Engine Build-up Section provided a new system. Actually there were two sections, tear-down as well as build-up, the first situated in a large, canvas-covered hangar, the second spread over three Quonsets. The used engine was brought to the tear-down hangar, mounted on a dolly that carried it through six stations, each manned by three men performing specialized jobs. For reasons to be explained later, the first was numbered Station Six. Here the generator, starter, vacuum pump and fittings, tach generator and propeller governor were removed. At Station Five, the three man crew removed the accessory case breather nipple, distributor pressure line, supercharger drain line and bracket and so on—until by the time the engine had passed through Station One it was stripped and ready to be pickled and shipped to the overhaul depot. Meanwhile, all usable accessories had been inspected, repaired and transferred to similiarly numbered stations in the build-up Quonsets, where the process of adding used accessories to new engines started at Station One and ended at Station Six. Thus each station here duplicated in reverse the work of the similarly numbered station in the tear-down hangar. And when the engine left the last station it was put in stock.

Improvisation was the order of the day when the 73rd first moved in, and everyone contributed ideas and more than the usual amount of energy. Dollies represented a problem until we began rebuilding them with Jap steel from the sugar mill and bogey wheel from wrecked amphtracs. Stock bins were built, each one in the tear-down section numbered to coincide with a number in the build-up section. These new bins were filled with parts from engine build-up kits taken from new units brought from the States by the B-29s. From then on, they were kept filled by parts taken from engines brought in for overhaul, the only stock shortages resulting from defective parts that could not be built back into the engine. In March this section handled 144,800 parts. According to Capt. Paul M. Lord, they could not function for more than three days without the parts provided by engine tear-down.

The operation grew like Topsy, and the results were beyond expectations. Whereas it had taken 160 man-hours to make an engine change on the hardstand, the job was now being done in an average of 137 man-hours. During periods of maximum effort, such as the March 10-20 incendiary raids against Japan, not one airplane was kept on the ground waiting for a new engine.

That's the way it worked at the 73rd Wing. But each new Wing faced new problems and found new solutions. Sometimes it was not easy to get started, especially where combat servicemen were also called upon to do their own construction. Sometimes, under these conditions, the old crew chief with less men but no less love for his airplane was called upon to perform almost superhuman tasks. And as always before he came through.

Later, Wings still in the States were being organized in accordance with consolidation procedures evolved on Saipan. When Japan surrendered, the system still had not reached a stage of complete perfection and the men were learning new tricks every day. But the job long since had shown fine returns in increased efficiency and economy.—Maj. Milton R. Krims, AIR FORCE Overseas Staff. ☆

Flying Hotel

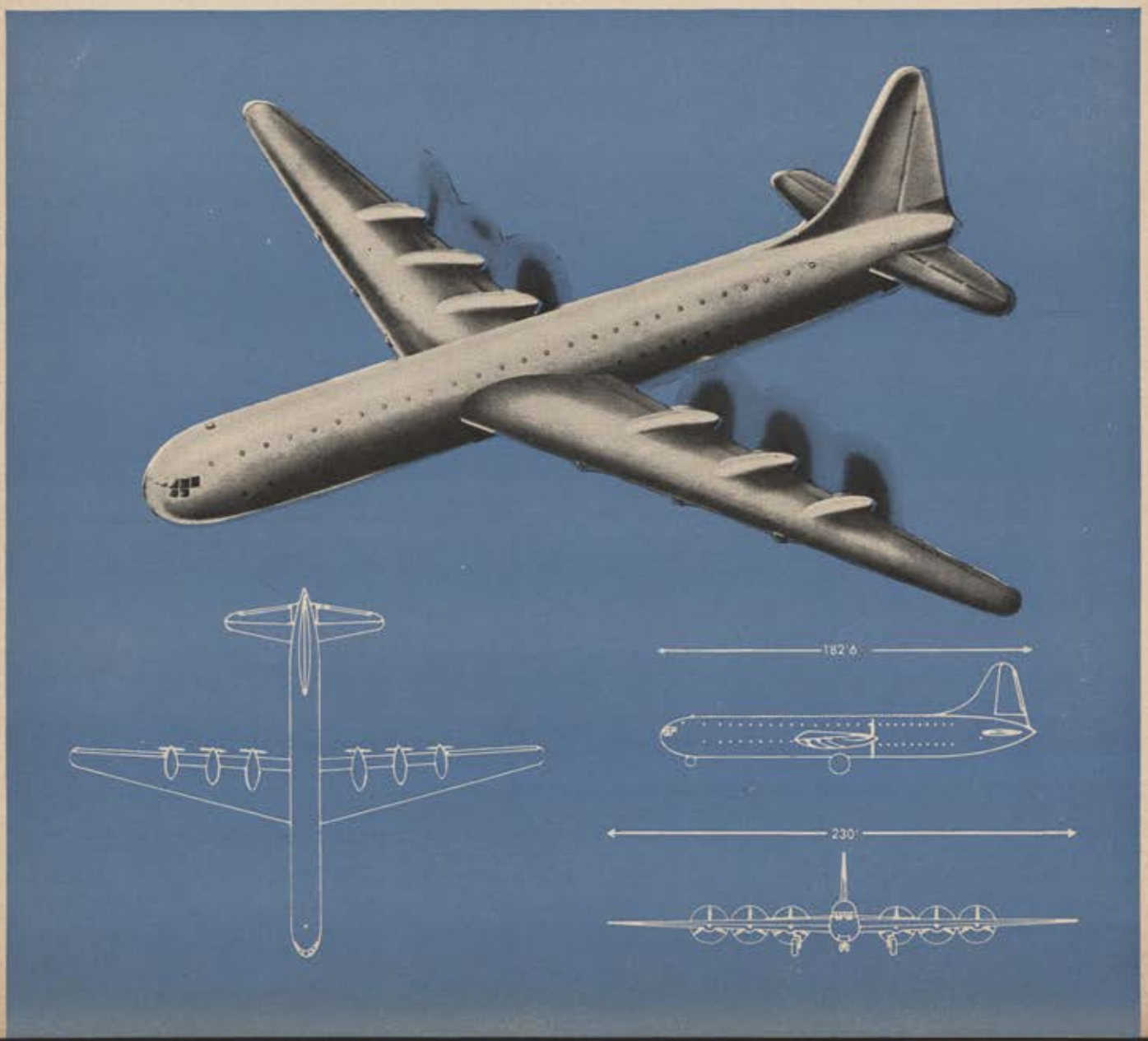
As the war ended, the AAF's C-99 was being rushed to completion to take its place as the largest of our cargo and troop air transports. This six-engine sky giant was designed to carry well over 200 fully equipped troops or more than 300 litter patients, or to stow such equipment as a 155-mm howitzer and carriage, a 5,000-pound six-wheel truck, even a complete P-47.

Now destined for a prominent role in postwar air commerce, the C-99 will have both "coach" and "Pullman" accommodations for 204 passengers. In addition to regular seating arrangements, the commercial design calls for 9 staterooms and 12 births, accommodating two passengers each, in one of the sections. Two lounges and a number of rest rooms also will be provided.

Built from plans originally drawn up for a mammoth bomber, the C-99 has an estimated range of 4,000 miles and a cruising speed of well over 300 miles per hour. The transport's wing span is 230 feet, more than twice the length of a B-24's wing. Its fuselage length is 182 feet and 6 inches from nose to tail, with a cubic capacity equal to that of about four boxcars. Weighing approximately 130 tons, the C-99 is about 12 times the size of present two-engine commercial air transports.

The plane's six huge Pratt & Whitney engines produce a combined power output equivalent to about 350 average automobiles or four passenger locomotives. The engines drive 19-foot, 4-bladed, pusher-type propellers, a feature which gives the C-99 a distinction of being the first pusher cargo aircraft ever built in this country. The highly swept-back wing, located in the center of the fuselage, supports the six engine nacelles on the trailing edge, permitting streamline effect into the laminar flow airfoil section thus gaining full advantage of the high lift-low characteristics. The C-99 has a tricycle landing gear, the main wheels of which weigh more than five tons. Inside, the C-99 has two decks with linking stairways. It is equipped to accommodate a crew of ten operating in two shifts. A number of telephones connect almost any part of the interior with the flight compartment. Constructed by Consolidated-Vultee, the C-99 incorporates many vital features gleaned from the lessons of war, including latest instrumentation, automatic flight gadgets, lighting devices and electrical systems. ☆

Some pertinent data on the C-99, largest of our cargo and troop carriers



FLYING FOR FUN

100-mission man or groundgripper, you'll need a license to breeze along the civil airways

BY HERBERT RINGOLD
AIR FORCE Staff

ILLUSTRATED BY S/SGT. TOM T. BEVANS

"There I was at 2,000 feet. There was no flak. No enemy fighters. There wasn't even a target. ETA? Never heard of it. I just loafed along, playing tag with the clouds. I didn't have a care in the world."

If you've always dreamed about filing a mission report such as this, you're a man who wants to fly a personal plane. You agree the automobile is a great invention, but as far as you're concerned a ride in the old bus can't match the thrill of hopping into a small plane and flying to the mountains for a fishing trip or taking the wife and kids on an outing in the family airplane.

Let's stop a moment. Just because you completed a combat tour that will make your grandchildren think you won the war all by yourself gives you no right to take off in a light plane and buzz around the country with reckless abandon. The long arm of Rules and Regulations still follows you; there are certain operational procedures which you must obey.

Before you can pilot a non-military aircraft, you must get a pilot certificate from the Civil Aeronautics Administration. You may have had thousands of hours in the hottest AAF plane; the Luftwaffe may have voted you The Man We Wouldn't Like to Fly Against Most; your chest may sag beneath the weight of your combat ribbons. That's all very fine but you still must have a certificate. Getting that certificate is easy, and it costs you nothing. This is what you do:

If you are currently on pilot status in the AAF, merely present a certificate of pilot status to any office of the CAA. Or bring along a Form Five—one copy. Imagine. You do not have to bring copies in triplicate, signed by everybody who can lift a fountain pen. You don't have to go through channels, coordinate with higher authority, or effect liaison with proper personnel. One copy will do.

There is only a single qualification you must meet—you must have 10 hours of first pilot time within the year preceding the date of application for a certificate. Only first pilot time counts. CAA won't accept time flown as copilot.

Next comes a short written examination. But don't visualize yourself sweating over a college exam of the type you used to get in Advanced Economics II. The CAA quiz consists of only 25 multiple-choice questions. It covers Sections 43 and 60 of the CAA regulations which deal with general operating procedures and air traffic rules. Officials of the CAA state that any AAF pilot who reviews the regulations should pass the exam without even sharpening a pencil. Copies of Sections 43 and 60 are available from the Superintendent of Documents, Washington, D. C., for five cents each.

That's all there is to it.

You have your choice between two licenses—private and commercial. The principal difference between the two is that a commercial pilot may fly for hire while a private pilot may not. A man holding a commercial certificate must get a physical examination every year; a private pilot takes a physical every two years. But you don't have to go through any further exams to receive a commercial certificate, so you might as well have it. Otherwise, you may have a very unfortunate experience, like that of the former P-47 pilot from the midwest. He figured he didn't need a commercial certificate because he was only going to do a little personal flying, but he made a costly miscalculation.

He was tinkering with his small plane at the local airport when a stranger approached him and said that he had been bumped off the airline. The stranger had to be in another

city late that afternoon and he offered $100 plus expenses for a flight of a few hours. The obliging P-47 pilot is now a groundgripper by decision of the CAA.

All the above information applies to men now on pilot status in the AAF. How about bombardiers, navigators, radio operators, gunners, members of ground crews and non-flying personnel? Also, how about men who were on pilot status but have been discharged from the service?

If you were on pilot status, but have been separated from the AAF, this is the procedure you must follow in order to get a certificate:

You must present a Form Five or a certificate indicating you were officially on pilot status in the AAF. And you must take a physical. If you want a commercial certificate, you will have to get your physical from registered CAA physicians who are available in almost every city in the United States. The cost is $6.00 and the exam is much less exacting than the Army 64. If you want only a private pilot certificate, however, you can take the physical from any doctor of your choice. Get Physical Examination Form ACA 1345 from the CAA and have your doctor sign it.

After you present the Form Five or the certificate of pilot status and pass the physical, you take the same written examination given to men on pilot status. Of course, you must show that you have had at least 10 hours of first pilot time within a year preceding the date of your application, and the required total experience.

If you were never on pilot status, this is what you do: To qualify for a private pilot certificate, you must take 10 hours of instruction from a rated CAA instructor and have 30 hours of solo time. Nothing in your past military record will get you out of filling any part of these requirements. To qualify for a commercial pilot certificate, you must take 10 hours of instruction and 200 hours of solo time. Then you take a stiff written exam, consisting of 250 questions on regulations, meteorology, operation of aircraft and the theory of flight and aircraft engines. It is necessary to pass 70 percent of the questions in each category.

Consider the sad plight of a B-24 navigator from one of the hottest groups in the ETO. He always wanted to be a pilot, and during the practice runs over England, he sat in the copilot's seat and took lessons on how to fly an airplane. Returning to the States, he received further instruction from a rated CAA instructor. By the time he finished, there was nothing he couldn't make an airplane do. But he made the grave error of figuring that his military experience would be sufficient to get him by the written examination. He was a hot rock on reading drift but he never heard of the CAA regulation governing the proper approach to an airfield. Result: He flunked the exam. Moral: Knowing how to fly is not enough. You must pass the quiz. Any office of the CAA will provide a booklet which outlines the material covered in the examination.

The following information applies to all men who make application for a pilot certificate: There are two additional steps you may take if you desire. *They are not required.* But if you expect to fly under instrument conditions you must have a CAA instrument rating. And if you expect to give flying lessons to students who want to receive CAA credit for that instruction, you must become a rated CAA instructor.

CAA instrument ratings are available in two ways. If you have a green card from the AAF, you will be given a CAA instrument rating without further examination. Without that green card, you must pass a written exam and a flight test.

The written exam for an instrument rating consists of 90 questions, divided into three parts of 30 questions each. The first section deals with CAA regulations regarding instrument flying; the second covers meteorology; the third consists of questions on orientation and operating procedure. Each section of 30 questions must be passed with a rating of at least 70 percent.

After you have finished the exam, you take a flight test on an airplane which you must provide. The plane must have dual controls, adequate instruments and a hood. It is important to note that this test is given on the primary instruments only. This means that if you are used to flying the full panel system, you'll have to review the technique of flying by needle, ball and airspeed.

If you want to be a rated instructor, the following rules apply:

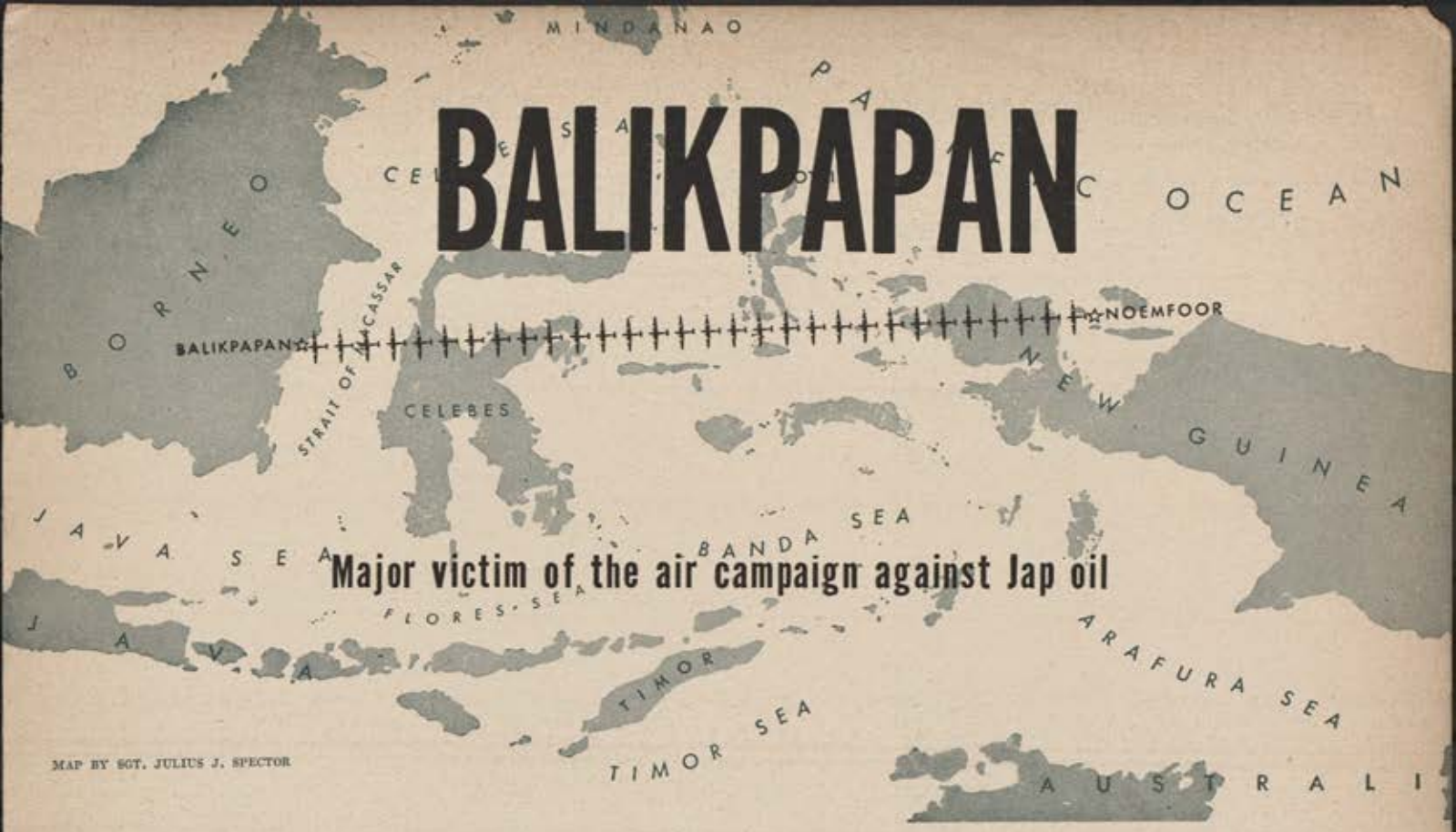
You must take a written examination of 200 questions. One hundred questions deal with the fundamentals of instructing, and the rest are on the analysis and performance of flight maneuvers. It is necessary to get 70 percent on each 100 questions in order to pass. Then a flight test is required. Again, you must provide an airplane which has dual controls, and you must perform ordinary maneuvers to the satisfaction of your examiner.

The CAA points out that while its examiners may be impressed with your ability to do an inside loop in a P-38, such acrobatics will do you no good as far as getting an instructor's rating is concerned. In light plane operations, you will have to be content with engines that develop considerably less horsepower than those in the military plane you've been accustomed to flying. The CAA is not only interested in your ability to fly; it is concerned with your ability to fly *safely*. Most CAA examiners are grey-haired veterans who trust you remember the old adage about old pilots and bold pilots.

The regulations mentioned cover all AAF personnel except liaison pilots and glider pilots. Liaison pilots may receive a private certificate by fulfilling the general regulations, but in order to get a commercial certificate, an "L" pilot must show he has 200 hours as a first pilot, accumulated after he received his rating as a liaison pilot. Glider pilots must show that they have 200 hours as first pilot on a

(Continued on Page 61)


火災時注水マデ



MAP BY SGT. JULIUS J. SPECTOR

BALIKPAPAN

Major victim of the air campaign against Jap oil

Germany lost oil and lost the war. Japan learned, too, that the sequence was inevitable. Weeks before final surrender, the Jap's once well-oiled war machine had almost run dry. The reason, as it was in Europe, was a strategically-calculated campaign against enemy oil centers. As in Europe, the campaign was waged almost entirely from the air.

Major oil center to be knocked out in the Pacific was Balikpapan. It had to be first. Other oil targets may have been important from a long range viewpoint, but Balikpapan was the principal, and often exclusive, source of petroleum for the enemy's daily operations in the Southwest Pacific. Balikpapan's annual output of 3,000,000 barrels went directly to the Jap's tactical bases, supplied his navy, merchant marine, aircraft and motorized equipment from the Carolines to Rabaul, and serviced points farther north, including the Philippines and the homeland, and the Netherlands East Indies to the south.

The storage and refining center of Balikpapan was built by the Dutch near the rich oil fields of Borneo. The Jap took Balikpapan early in the war and was certain he could hold it, felt secure in its location and in the strong defenses he placed there. But he underestimated, or couldn't comprehend our capabilities in the air. By the time he learned, he was powerless to do anything about it.

←Gaunt monument to airpower is wreckage of a Balikpapan paraffin plant smeared in strafing and skip bombing attacks by 13th.

This Jap sign stood outside a Balikpapan refinery, threatened severe punishment in three languages to anyone bringing fire near the plant. The 13th Air Force ignored warning.

The air campaign against Balikpapan began in August, 1943, when B-24s of the 380th Bomb Group, under direct operational control of the RAAF, struck from northern Australia in a series of three hazardous 2,700-mile missions, the longest attempted in the SWPA up to that time.

Later, the job was turned over to the 13th Air Force, which had moved up from the Solomons to Noemfoor. Elements of the 5th Air Force participated in initial attacks against Balikpapan from Noemfoor, and the RAAF attacked its shipping and later supplied close air support during its invasion. But the campaign against Balikpapan was essentially a 13th Air Force show.

Opening the campaign from Noemfoor on September 30, 1944, the 13th flew two 2,600-mile round trip missions without fighter cover, and paid a relatively high price. The third mission went out with fighter escort in a surprise attack. By the end of the sixth major blow, the 13th had knocked out two Balikpapan refineries. Then the Philippine campaign intervened, and Balikpapan had a long breather while the 13th helped support land action in Luzon, the Visayans and Mindanao. Early in 1945, Balikpapan again came up on the 13th's schedule — this time for keeps.

From the opening attack to the July 1 F-day attacks from bases closer to the targets, the 13th flew more than 2,300 sorties against Balikpapan, smacked the oil center with more than 3,400 tons of bombs. Photographs on the following pages tell of how the air campaign wiped Balikpapan off the target list and off the Japanese map.

BALIKPAPAN *Continued*

Evasive action did not save this Kongo-class battleship in 1943 from bombers which scattered convoy while attempting oil blockade in Borneo area.

Complete blockade was impossible. The search area was too great. Balikpapan had to be knocked out from air. At first it took long, unescorted missions; then came fighter cover, low-level attacks and, finally, air coordination with ground invasion forces.

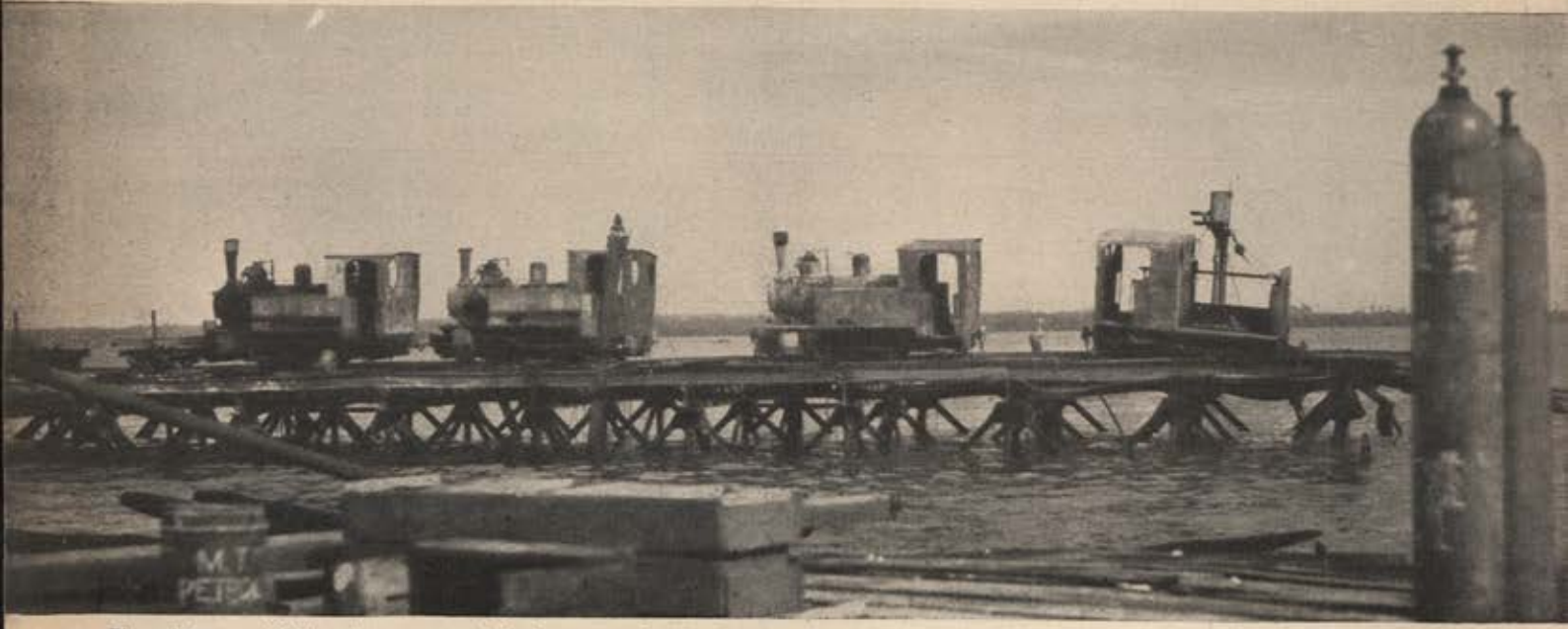
Balikpapan's objectives were attacked in their order of importance. First came refineries and cracking plants, then vital oil storage tanks.

Hottest target east of Singapore, Balikpapan was first defended in the air, but Jap fighters fell victims to attrition. Scores of guns like this 127-mm dual-purpose naval weapon also attempted to repel our air assaults in the months before Allied invasion.

Napalm bombs made of jellied gasoline composition were dropped on Balikpapan. Outlying rail junctions, jungle storage areas and Japanese troop outposts like this flaming garrison were given the heat treatment by low-flying planes during the closing stages of the air campaign.

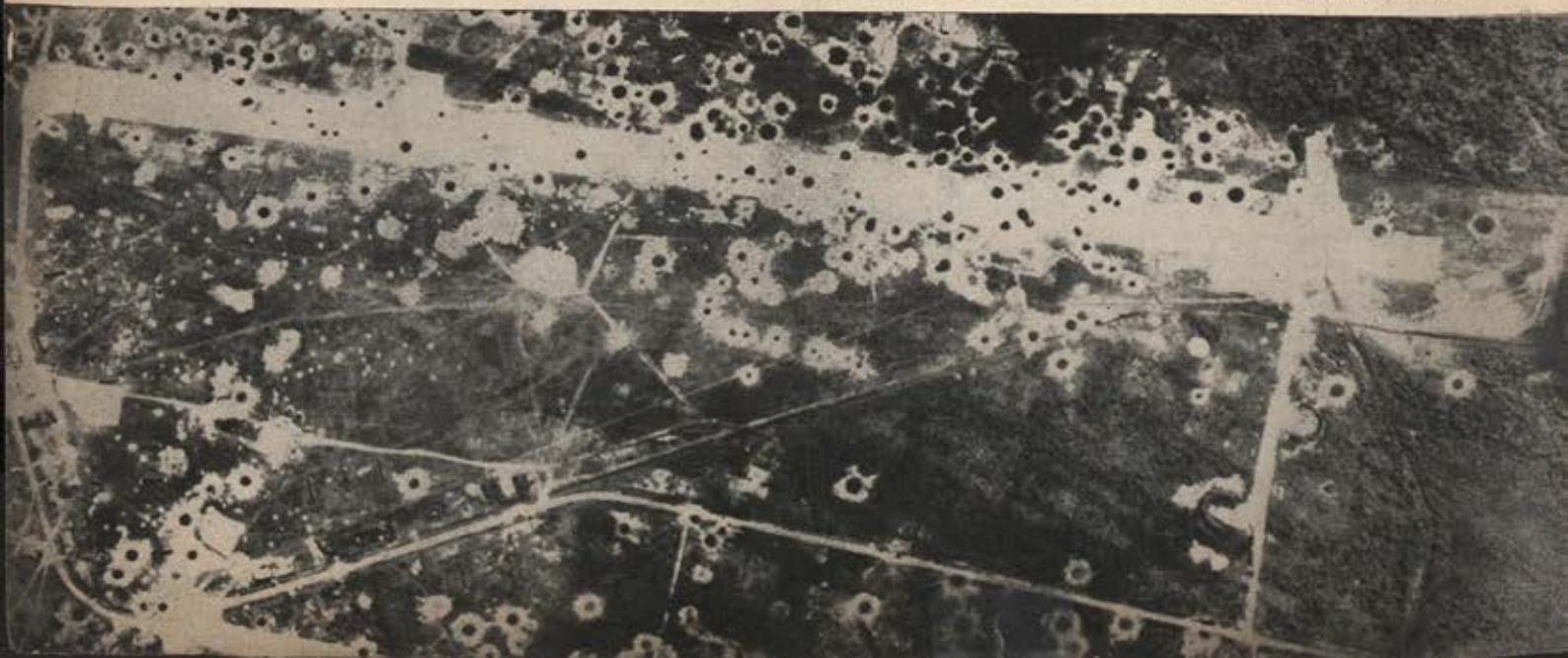
BALIKPAPAN *Continued*

Inland supply lines, vital to the enemy's oil reserve, received careful and continued attention from the B-24s. Bridges necessary to the Japanese transportation network were prime targets throughout the campaign and scenes like the above became common toward the end.



These "Toonerville" engines are part of the Japanese railroad rolling stock which was used to bring oil to the docks of Balikpapan, there to be delivered to tankers for transport to areas of Jap navy and air operations. Bomb hits on the trestle left these locomotives "at sea."

This cross-section of martial Swiss cheese is actually the airfield at Manggar, in the Balikpapan area. Allied planes reduced the enemy's ability to fight back by battering airdromes continuously. Enough explosives scored direct hits here to create a constellation of craters.



Invading troops of the Australian 7th Division landed near Balikpapan at 0855 hours, July 1. Impeded by static beach obstacles but facing no troop opposition due to pre-invasion bombing and strafing, the battle-seasoned forces quickly secured their vital beachhead.

Seppingang airstrip was captured after a prolonged struggle. Aussie engineers had it ready for use on F plus 14. The first plane to land was this 13th Air Force Catalina.

Aussie aircraft controller directed the air support and the 13th coordinated the action.

Refineries which had been converting the crude oil into fuel for the day to day Japanese operations were bombed to rubble by air attacks.

Bombed and burned oil tanks sprawled in hollow shapes throughout Balikpapan fields, breaking the link between wells and refineries.

These factories stand gutted by flames, and black clouds of smoke still rise a week after the bombers had completed their mission.

This scene of desolation, with its battered factories, twisted precision machinery, reveals part of the havoc wrought at Balikpapan.

OUR POWER TO DESTROY WAR

(Continued from Page 10)

What are we going to do?

At the moment, we are bending every effort and we have every hope that the United Nations can and will work out a system for maintaining the peace which will make it impossible for an aggressor to arise. It should be remembered that these present and probable technological developments which would be so deadly a peril to us if we let our present preeminence in the field go, and, neglecting our safety, remained indifferent while a potential aggressor outstripped us, are also the means by which the rise of any such aggressor could be made almost impossible.

If it is objected that we are not yet certain that the United Nations Charter or any other international instrument will really work, that is, of course, true. The point is that, basically, the means by which we hope to make the United Nations Charter work are also the means by which we will have to safeguard our country if the United Nations Charter does not work. We are now the most powerful nation in the world. Our possession of power, which, in a just proportion, we can make available to the United Nations in the maintenance of peace, is the best guarantee of maintaining this collective peace. If the nations of the world find that they cannot act in concert, our possession of power will be our only resource. Therefore, we must at all costs maintain it.

What do we need to maintain it?

I will start by emphasizing that I am not holding any brief for a permanent air force. Maybe we will find that we don't need any air force in terms of the mighty air forces we built up during the war. What we will need is an adequate, well-trained, fully-equipped force of whatever kind is necessary to use the new weapons and devices properly.

I believe that we will need a system of universal military training which can back up this force, whatever its name or nature, with a constantly renewed reserve available for rapid expansion in an emergency.

Most important of all, we will need an ably staffed, adequately financed and properly equipped research and development program. I say, *most important of all*, because if we fail to keep not merely abreast but ahead of technological development, we needn't bother to train any force and we needn't make plans for an emergency expansion; we will be totally defeated before any expansion could take place.

An effective research and development program involves an intricate and complicated organization. The accompanying chart shows the movement of research requirements through the Air Force organization and through the civilian agencies helping us with our developments. From it you may get some idea of the endless study and testing and checking, of the huge laboratories, the great testing grounds, the thousands of highly skilled personnel, which comprise our present program of research and development.

All this is expensive, of course, but I wish to assure you as earnestly and forcefully as I can that it is one expense that we must not now, or ever, skimp or stint. It is the price of security and the price of peace.

As I see it, this is the hope for the future. The new weapons, the atomic bomb and so on, are terrible and terrifying only if we assume that they must fall into the hands of men, like those leaders of Germany and Japan now defeated, who seek not peace, but plunder and world domination. I do not believe that they must fall into such hands.

I think we can, here and now, make those wise decisions which will keep these terrific forces as the bulwark of a just and equitable world system. The power which lies in them, great enough to destroy civilization is great enough, if we use it rightly, to destroy war. ☆

AIR FORCE MAGAZINE — CAPT. BILL LENT

RENDEZVOUS

(Continued from Page 3)

a bunch of random Troop Carrier planes and crews and an assortment of first lieutenants, PFCs and limited-service combat personnel. There were squadron leaders and flight lieutenants and South African captains there, too.

There are lots of interesting things about MATS. It was not a perfect Allied organization, but it was the only Allied group I know that functioned with maximum efficiency and minimum nationalism. I, as an American officer, was proud that MATS was allied and that American, British and South African crews flew our regular routes. I was proud that in my own (Constantine, Algeria) area, British and American transport officers worked in harmony to expedite passengers and cargo regardless of nationality.

I was proud of the officers and men I was associated with in MATS. They started air terminals at Oran, Algiers, Constantine, Bizerte, Tunis, Palermo, Catania, Naples, Foggia, Bari—and many other places—from scratch, without adequate supplies and with no authority other than their own American ingenuity and good will which secured cooperation from whomever they contacted. They talked the Service Command into supplying men, miscellaneous supply depots into giving them materials, British engineers into giving them labor. I was and still am proud of working with those men, even with the Italian POWS who were so proud to work for us. . . .

1st Lt. Paul C. Kell,
556th AAF Base Unit,
Long Beach, Calif.

The Real Father

Dear Editor:

Realizing that it was not with malice aforethought nor arbitrary omission on the part of AIR FORCE's editorial staff, we attribute your failure to mention the name of the real father of the frangible bullet in the April issue to a lack of information on the subject.

We in no way wish to discredit the work of AAFTC, NDRC and ATSC because without them the project would not have reached fruition, but on the other hand, had it not been for Maj. Cameron D. Fairchild, who conceived the idea at Laredo Army Air Field over two years ago, there would not have been any project.

1st Lt. J. Eugene Hoover,
Laredo (Texas) Army Air Field.

Long Reach

Dear Editor:

I beg to differ with a statement made in the article "Scandinavian Carpetbagger" published in the August issue of AIR FORCE. Statement in question: "The flight from Britain to the drop zone and return covered more than 2,600 miles and took 16½ hours. It was probably the longest combat mission ever flown in the ETO."

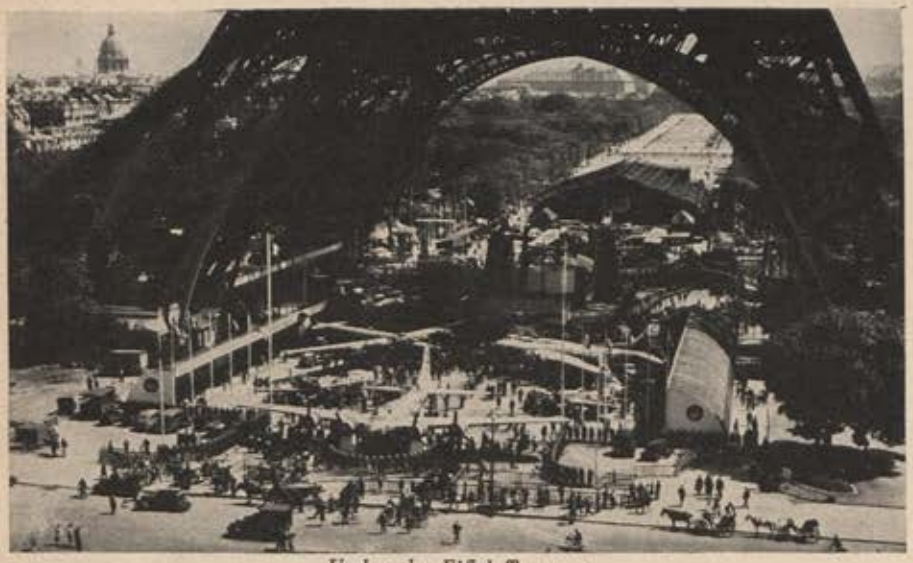
During the summer of 1943, while stationed at Port Lyautey, French Morocco, the 480th Antisubmarine Group carried out

(Continued on Page 61)

News and Views around the World

CROSS COUNTRY

Wings of Peace over Paris—Page 38



Under the Eiffel Tower—

a kid smiles up into a bomb bay—

and a veteran Fortress shows off.

AAF's Paris Exposition

Officials of the underground railway system telephoned on the second day of the U. S. Army Air Forces Exposition in Paris. They wanted to know how long the exposition was scheduled to run, explaining that they had already found it necessary to provide extra trains to handle the crowds.

Thus was the spontaneous reception accorded the exposition by Parisians, who welcomed a chance to see at close range the airplanes the Americans had used to throttle German industry, shatter communications, deplete oil production and furnish air cooperation for ground troops.

Never before has any foreign population been afforded an opportunity to see the components of American air might on such a grand scale. Under the famed Eiffel Tower Frenchmen, as well as thousands of ever-curious GIs, could see 18 types of aircraft—Flying Fortress, Liberator, Thunderbolt, Mustang, Lightning, Black Widow, Marauder, Havoc, C-47, C-46, gliders, Cub-scouts—virtually every type of operational plane used in our air war against Germany.

Wooden stairways were built to wind up and around most of the planes. Pictorial exhibits, consisting of huge blow-ups with French texts, told the story of strategic bombing, tactical operations, the troop carriers, the transport command airways communications, aviation engineers, air defense organizations.

Parisians loved it. They came by the thousands. On Sunday, August 5, an added thrill was advertised—an air show of Fortresses, Marauders, Mustangs and Thunderbolts. Thrill-seekers jammed the 300,000 square feet of the exposition grounds, a crowd estimated at 130,000 when the planes arrived overhead. The situation became so chaotic that the MPs had to close the gates until some of the spectators departed. At the end of the first week 450,000 had seen the show; this figure jumped to a million at the end of 18 days.

Lt. Gen. John K. Cannon, commanding U. S. Air Forces in Europe, opened the exposition at a special preview July 31 on the eve of Air Force Day, 38th anniversary of AAF. Dedicating the exposition to the French who saved thousands of American flyers, General Cannon said: "Nobody can place a value on the lives they saved. From a military standpoint alone, the rescues were of great importance to us. This work was so dangerous that the average span of life of the leader of one of these underground chains was eight months. These were French men and women fighting and dying for their country, and, in doing so, giving immeasurable aid to America and the cause of freedom. They were soldiers in the finest tradition. We shall never forget them." Other speakers included U. S. Ambassador Jefferson Caffery, Georges Bideault, French Foreign Minister, and General Gene Bouscat, French Air Forces commander.

The planes, most of them battle-weary, were of greatest interest. But not far behind were the free movies offered in the Butler portable hangar built by the Engi-

neers. There combat films furnished by the 8th and 9th Air Forces, and features such as "Memphis Belle," and "Fight for the Sky," were exhibited. Other displays of special interest included a buzz bomb model, massive searchlights, Norden bombsight, air-sea rescue equipment and gaudy parachutes which draped the Troop Carrier section.

Sixteen-page souvenir booklets with French and English texts were given away at the rate of 15,000 daily.

Newsreels, radio and press notices spread the fame of the exposition, and it became a "must" for most visitors to Paris during August and September. Army Air Forces officers from the MTO came to see it, and went away with plans to duplicate it in Rome. Plans also were underway to produce expositions in Copenhagen, Oslo, The Hague and possible other European capitals. The exposition was conceived by Office of War Information, which planned and produced it in close cooperation with all air components in the European Theater.

Low Roll

We could exercise a healthy doubt toward this following item, except that it comes to us from a source that has always been sober and reliable. It seems that a 5th Air Force B-25 weighing 28,000 pounds, loaded with four 250-pound bombs, flying at 150 feet at an indicated airspeed of 240 mph, completed a snap roll and its crew lived to tell it.

Piloted by 1st Lt. George Ellis, this plane was flying in No. 2 position in "A" flight of a six-plane squadron formation. The target was a railroad marshalling yard on Formosa. Nearing the target, the formation was descending to tree-top level for the bombing and strafing run. An object, unidentified but believed to have been anti-aircraft shell, hit the nose-wheel compartment of the B-25, causing the nose-wheel door to fly open. This sudden interference with the normal air flow threw the plane upside down. The nose-wheel door was blown off. Reacting properly, Ellis pulled the stick back and held the right rudder with the roll. The plane leveled off about 10 feet above the ground.

Ellis then took a position in another squadron of his group and completed the bombing and strafing run. The bombs fell on the target and the pilot took his damaged Mitchell back to base.

When they landed, Navigator Bruce C. Currie climbed out, and grinned at Ellis. "Do that often?" he asked.

High Scoring

Recent tabulations indicate that final accounts will list the 9th Air Force's 354th P-51 fighter group as the top scorer in aerial kills for the European Theater of Operations. When the "Pioneers" knocked down 157 German aircraft in aerial combat during the last 60 days of the war, they boosted their total to 701 planes, plus 256 on the ground.

The ratio of the 354th group's victories against their losses indicates a score of better than five to one over their German

PLANE BONERS

Analyzed by Veteran Pilots

MEDIA, PENN.—A flight officer bluffed an operations sergeant into giving him a local flight clearance for a BT-13 after he was told by the operations officer that the plane wasn't available. The pilot took off and violated regulations by going outside the local flying area to the vicinity of his home at West Chester, Penn. According to the pilot, the engine began running rough about this time and he landed successfully at a golf club, but the right wing struck a pole. Later a take-off was attempted but the engine quit and the trainer settled back to the ground, rolling until it hit uneven ground where the landing gear collapsed.

Comment: This fellow may be able to fly an airplane but he certainly isn't a qualified pilot. He asked for the book and almost got it. For his unauthorized flight and other breaches of rules, a general court-martial socked him with $75 a month pay forfeiture, three months restriction to post and suspension from promotion for one year.

FT. SUMNER, N. M.—P-47D was taxied into take-off positon, throttle opened and take-off run started. At 150 mph with the tail raised the pilot could not get the plane in the air. Full throttle and back pressure on the stick was tried without any change in results. Pilot cut switches as he was nearing end of runway and groundlooped.

Comment: Pilot did not have his trim tabs set correctly for take-off. Be careful in using trim tabs—they are extremely sensitive. It is difficult to overcome the tremendous pressures exerted by improperly set tabs.

FORT MYERS, FLA.—Flying at 5,000 feet in a B-24H, the pilot found the controls jammed, making it extremely difficult to move them backward and elevate the nose. The pilot returned to his field and, luckily, accomplished a landing without damage to the bomber. Check of control cables revealed that a strap on the engine covers stowed in the rear part of the fuselage had become lodged between the automatic pilot servo unit and the elevator control cable pulley.

Comment: Correct stowage of engine covers is on the upper deck of the rear bomb bays.

HIGGINSPORT, OHIO—After flying an A-20 on a ferry flight for 20 minutes, the pilot tried to orient himself by radio. The radio equipment was inoperative. Various headings were flown without success. Pilot claimed poor visibility prevented pin-pointing position through visual checks. After flying more than three hours, fuel became short and a forced landing was made on a highway. Check of the plane disclosed that the gyro compass precessed excessively. Records indicated it hadn't been swung for four months. The radio compass was inoperative and reception by the command radio was poor. The airplane had not been flown for almost two months and had not been checked by an engineering officer prior to flight. There was also a 100-hour inspection due. The pilot had not been instructed in the type of flying done in the United States by ATC and had not been instructed in the use of the A-20 radio.

Comment: Luck is a good thing to have, not to depend on. Don't fly flights you aren't qualified for in an airplane not in safe flying shape.

SAVANNAH, GA.—Turbo boost was lost on No. 1 engine on a B-29 while on cross country flight. Black streaks began coming from right accessory door, increasing in frequency until, while on downwind leg during landing, No. 1 engine burst into flames. CO_2 bottles were discharged, the prop feathered, and the fire was put out by field equipment after landing.

Comment: This fire was not fault of engine but of ground crew. It was caused by exhaust gas escaping from the second flexible joint ahead of the supercharger. Three bolts were missing from the chevron clamp that holds the flexible joint to the collector ring, and the fourth bolt was loose. Nuts were not safety wired.

FORESTVILLE, MICH.—P-47 student pilot made a few passes at the target while on a gunnery mission and then noticed that his rpm was fluctuating, first overspeeding and then dropping to 1,500. Pilot put prop in manual position and tried to advance his rpm but fluctuation continued. Pilot made a forced landing.

Comment: Check disclosed that the auxiliary tank, C and D chambers of the carburetor and the main fuel line from the fuel selector valve to the engine fuel pump were dry. No malfunction could be found. After exhausting fuel supply in auxiliary tank, the pilot believed he had a runaway prop and, concentrating on this alone, forgot to change to the main tank.

PREPARED BY THE OFFICE OF FLYING SAFETY

QUESTIONS

on Policy and Procedure

Q. Must National Service Life Insurance be converted to ordinary life, 20-payment or 30-payment life within five years?
A. *Under a new law recently signed by the President, reconversion is not necessary until eight years after the date the policy was issued.*

Q. Is it proper to make an entry in the forwarding indorsement in the Service Record of the fact that the soldier was favorably or unfavorably considered for the Good Conduct Medal or Clasp upon transfer?
A. *Upon transfer, a statement with date that the enlisted man was considered "favorably" or "unfavorably" for the Good Conduct Medal or Clasp will be made under "Remarks—Administrative." (Par 66v (7), TM 12-230, 18 October 1944.) There is no authority for making this entry in the forwarding indorsement.*

Q. May wives of officers overseas belong to officers' clubs at bases in the area where they reside?
A. *AAF Letter 35-103, 13 June 1944, states that it is desired that necessary steps be taken to provide that the wives of AAF officers, warrant officers, and flight officers, whose husbands are permanently assigned to overseas duty, be afforded the privileges of such officers' clubs (or officers' messes, in appropriate cases) within the vicinity in which they reside, upon their payment of dues at a rate determined by the club council, but not in excess of that which would normally be charged their husbands were they members of such clubs.*

Q. What disposition should be made of soldier's pay data cards (WD AGO Form 28) now in the possession of enlisted persons in the United States who are not alerted for oversea service?
A. *In the case of an enlisted person in the United States who is not alerted for oversea service, the pay data card if in his possession will be filed with the Service Record for reissuance if such person is later alerted for oversea service. This is not meant to imply that each enlisted person must have a pay data card, but provides for the disposition of the card when an enlisted person in the United States not alerted for oversea service has one in his possession which was prepared under previous instructions.* **(Par 13g (1), AR 345-155, C 1, 14 June 1945.)**

Q. If the wrong date of birth is entered in a Service Record, how may it be changed?
A. *Pursuant to AR 345-1, authority is delegated by AAF Ltr 35-2, 15 May 1945, to commanding officers of all AAF installations to change the record of the name, date of birth, or place of birth of an enlisted man or woman while in active service. After final action has been taken to change the records, all supporting evidence will be forwarded, as required by AR 345-1, direct from the commanding officer making the change in the record to The Adjutant General, without reference to Headquarters AAF.*

Q. Must every organization maintain a duty roster?
A. *AAF Ltr 35-37, 16 December 1943, delegates authority down to the station level to dispense with maintenance of the duty roster in those specific installations, organizations, and detachments where maintenance of the duty roster serves no useful purpose in effecting daily assignment of personnel to housekeeping details.*

Q. What is the time limit for submitting claims for reimbursement for travel performed by dependents of military personnel on permanent change of station?
A. *Claims for reimbursement for travel performed by dependents of military personnel shall be forever barred unless such claim, bearing the signature and address of the claimant or an authorized agent or attorney, shall be received in the General Accounting Office within 10 full years after date such claim first accrued: Provided, that when a claim of any person serving in the military or naval forces of the United States accrues in time of war, or when war intervenes within five years after its accrual, such claim may be presented within five years after peace is established. (Section 1, WD Bulletin No. 33, 9 November 1940.)*

Q. May a creditor file claim against National Service Life Insurance payments to the beneficiary of a soldier killed in action?
A. *No. NSLF policies cannot be attached for debts. (Note: This is also true of Soldiers' Deposits. Though deposits and interest are exempt from liability for debts they may be applied to the satisfaction of indebtedness to the Government, if authorized by the enlisted person.)*

PREPARED BY THE OFFICE OF THE AIR INSPECTOR

opponents, and most of the group's major air battles were fought against odds that great. The biggest day in the history of the unit was August 25, 1944, when its pilots accounted for 51 enemy aircraft and broke four fighter records. On that day the group became the first to pass the 500th mark in less than nine months of combat and to take such a toll of enemy aircraft. Thirty-eight of these were aerial kills and 26 were accomplished by one squadron.

Final group totals show that the 354th, now commanded by Lt. Col. Jack T. Bradley, destroyed or damaged 6,804 locomotives, 3,034 military trucks, 150 armored vehicles and tanks, 5,282 railroad cars, 834 buildings, 55 bridges, 112 gun emplacements, 15 gas or oil dumps, 37 hangars, made 245 railroad and 76 highway cuts, and killed 500 enemy soldiers while spearheading Third Army drives with attacks on German airfields, marshalling yards, towns, communications and supply lines.

Movement through Meeks

On a map of the North Atlantic, the little shape of Iceland hangs like a bat from the Arctic Circle. It is 1,500 miles from Labrador, 850 miles from Scotland. Since the establishment of the ATC's big Meeks Field, this strategic spot has been called the stepping-stone between hemispheres, an aerial cross-roads of the Great Circle route.

Men of the ATC permanent party call it "The Rock." They call themselves the Forgotten Bastards of Iceland and issue, with proper ceremony, certificates to all men who have endured the requisite period of 101 days in Iceland.

Iceland is roundly cursed by permanent party and transients alike on account of its weather. It was rough as a cog in the early days of Meeks and some of the personnel had to live in tents. At one time a gale reached 130 mph and five men were killed. On several occasions no one was able to go back and forth between the offices or reach the mess halls, and now it is a rule that during high winds men must never go outdoors singly.

Meeks' four 6,000-foot runways were hacked out of stubborn terrain, and perhaps only the coolie-built B-29 bases in China were a more difficult chore to construct. At the opening ceremony in March, 1943, the field was named in honor of the first American casualty in Iceland, Lt. George B. Meeks, P-40 pilot, who died on patrol April 19, 1941, when his plane crashed into Reykjavik Bay. The full name of Meeks Field, commanded today by Lt. Col. Ronald C. McLaughlin, is 1386th Army Air Forces Base Unit, North Atlantic Division, Air Transport Command.

Soldiers flying by way of Iceland in the mighty eastbound armadas, and more recently on the great westbound movement, have often been weathered in from two to ten days at Meeks Field which is located in southwestern Iceland, near the fishing village of Keflavik and 35 miles from the capitol city of Reykavik.

Due to the swiftness with which good flying weather sometimes follows bad at

Very honorable discharge.

Meeks, transients are not allowed to leave the field, with the result that thousands upon thousands of military birds of passage know nothing of the island beyond Meeks' runways, mess halls and billeting huts.

This has been a misfortune attributable to the exigencies of war. If it had been expedient to allow transients to leave Meeks for a good look around, they would have discovered that despite the gales, williwaws, fogs, drizzles and general cussedness of the weather, Iceland is an interesting and often pleasant place. It is not cold and snow, but rather gales, fog and humidity that make Iceland weather so villainous. Due to these conditions visibility can close down from adequate to zero while a bomber is making its final approach to the field. Yet, there are also days when the air in Iceland is perfectly clear. Such times are idyllic with yellow sunshine, green grass, blue water and magnificent cloudscapes.

The record of both Iceland and Meeks Field in World War II has been brilliant, especially in the establishment in England of the scores of AAF bombardment groups and, later, their redeployment. Here is an initial summary of Meeks Field's record as of early August:

Total aircraft handled—13,500 (eastbound 7,300, westbound 6,200).

Total personnel transported in these aircraft 174,000 (eastbound 55,000, westbound 119,000, including 20,050 wounded). Thousands of tons of cargo and mail also were aboard the planes. The Iceland route for four-engine planes called for stops at Presque Isle, Maine; Labrador or Newfoundland; Meeks; Valley Wales, or Prestwick, Scotland—and vice versa. Two-engine aircraft added Bluie West One, ATC's field in southern Greenland.

Breaking down the overall figures a bit:

Of the 7,300 eastbound aircraft that roosted at Meeks during the great flow to the ETO in 1943-44, 6,800 were tactical—B-24s, B-17s, B-26s, A-20s, and even a few P-47s with belly tanks. The other 500 were transports—C-54s and C-46s.

Transports (3,600) outnumber tactical aircraft (2,600) in the westbound total. This is due to the Green Project which calls for the movement of men from the ETO to America and separation. Early in August 54,000 Green Project men had passed through Meeks. In the White Project, which the redeployment of the 8th and 9th Air Forces was called, more than 2,000 four-engine bombers, loaded with 20 men each, and nearly 500 two-engine, with 13 men aboard, had moved through the field.

Then, there was the Eversharp Project, the movement in May and June of 62 generals with entourages totalling 400 persons from the ETO to Washington. This went off without a hitch, but Meeks personnel still get a nervous twitch when anyone says "Eversharp."

Farewell to 'Grandpappy'

"Grandpappy," sire of the Superfortress, is being dismantled at Albrook Field in Panama. The Big B-15, which had seven feet more wingspread than the B-29, never saw combat, but it did achieve an enviable transport record. Over an 18 months' period "Grandpappy" carried more than 100,000 pounds of freight and 5,350 passengers to various bases of the 6th Air Force in Panama and elsewhere. Perhaps the big plane's major contribution was academic, however. Its flight characteristics and records were closely studied by engineers who evolved the Superfortress.

Evacuation

The following account of one evacuation mission has been set down by an AAF evacuee, Lt. Michael Frome. This little sketch, multiplied by countless thousands, has been enacted in all the theaters of the war:

There are odors of war which etch the brain with their tragic presence, then return again in pleasanter places; sometimes they mingle with the fragrance of ham and eggs, a can of tobacco or a woman's perfume.

Okinawa was bloody in May. Mangled Jap bodies lay where they had fallen. American wounded were picked up, sulfa was sprinkled over their wounds, and they were evacuated by air. Thick plaster casts were moulded around broken bodies and they were moved thousands of miles to the east, to heal and forget rain-soaked Okinawa.

Late one night the evacuation plane dropped down on Kwajalein in the Marshalls to refuel and change crews—Kwajalein, once rich with palm trees, now flat as

In Iceland, cold living—

Warm swimming—

Fine skating!

NEW BOOKS

WAR

DOCTORS AT WAR. *Morris Fishbein.* Accomplishments of American doctors in World War II. DUTTON, N. Y., 1945.

MEN UNDER STRESS. *R. R. Grinker* and *J. P. Spiegel.* Case studies describing how the physical strain and emotional upheaval of battle have affected men. BLAKISTON, PHILADELPHIA, 1945.

HISTORICAL

RUNWAY TO THE SUN. *Robert L. Scott, Jr.* Boyhood and pre-war Army flying experiences of this fighter pilot. SCRIBNER'S, N. Y., 1945.

POSTWAR

YOUR PERSONAL PLANE. *J. P. Andrews.* Civil aviation prospects after the war. DUELL, SLOAN & PEARCE, N. Y., 1945.

TECHNICAL

DEMONSTRATIONS AND LABORATORY EXPERIENCES IN THE SCIENCE OF AERONAUTICS. *Aviation Education Research Committee.* Instructions for making simple apparatus to illustrate the principles of aeronautics. MC GRAW-HILL, N. Y., 1945.

THE LAW OF AVIATION. *R. W. Fixel.* A new edition of this treatise on aviation law. MICHIE COMPANY, CHARLOTTESVILLE, VA., 1945. 2d ed.

AIR TRAFFIC CONTROL. *G. A. Gilbert.* Present and future plans for greater safety in air traffic. ZIFF-DAVIS, CHICAGO, 1945.

CLOUDS, WEATHER AND FLIGHT. *Thomas C. Gillmer* and *H. Erich Nietsch.* Practical weather forecasting, primarily in its relationship to aviation. VAN NOSTRAND, N. Y., 1944.

DYNAMIC METEOROLOGY. *Jorgen, Holmboe,* and *others.* An introduction to the subject for those preparing for a career in meteorology. WILEY, N. Y., 1945.

U H F RADIO SIMPLIFIED. *M. S. Kiver.* U. H. F. radio presented as an outgrowth of the more familiar low-frequency equipment. VAN NOSTRAND, N. Y., 1945.

METEOROLOGY FOR PILOTS. *R. W. Mudge.* Interpretation and use of weather information for flight planning. MC GRAW-HILL, N. Y., 1945.

YEAR BOOKS AND HANDBOOKS

PLASTICS CATALOG, THE 1945 ENCYCLOPEDIA OF PLASTICS. Covers recent progress in all phases of plastic materials—fabrication and use. PLASTICS CATALOGUE CORPORATION, N. Y., 1945.

These books are available to AAF personnel through the AAF Field Technical Library Service, which provides for technical libraries at all major installations. For a complete list of books so available, see TECHNICAL PUBLICATIONS FOR ARMY AIR FORCES TECHNICAL LIBRARIES, Book List No. 2, March 1945 and supplements thereto. These lists are compiled by AAF Headquarters Library.
Personal copies of these books may be obtained from the publishers or retail bookstores.

the Pacific around it. Patients able to walk climbed down for dinner. For those in their litters, food was carried in. The Red Cross was there with books, magazines and smiles.

A fresh crew, flight nurse and medical technician boarded the plane. A walk through the cabin with its oppressive heat and stench to the flight deck almost overpowering. The crew closed the cabin door and looked out into the cool darkness, the clean night.

Then they flew again, the crew mindful of the pain and suffering behind. The technician walked among the 30 sick and wounded men. The nurse began to sort out her needles: morphine for agony, eight men to have penicillin every three hours.

Among the wounded was one boy, nearer to death than all the rest, a prisoner inside his cast which covered both limbs, much of his body and one arm. After a time the flight nurse went up forward for a cigaret. She had tried to make an intravenous but the boy's vein was so tight she could not force the needle in.

Venus rose and the sun not long after. The outline of tiny Johnston Island lay just ahead. The nurse asked the radio man to call for a medical officer to meet the plane. The plane settled easily and the patients heard the nurse and a Navy doctor.

"I don't think there's any need to take him off," the doctor said. "Hickam Field is but a few hours away. We'll refrigerate the leg. He'll have to lose it. They can give him proper attention up there."

Breakfast was like a strange ritual. The odor of the cabin permeated the coffee and scrambled eggs. Then the big plane took off for Hawaii where they have hot showers, and clean sheets.

Halfway out the nurse came forward. "My boy is better," she said to the crew. "His temperature is down."

It was noon when they landed, the finish of a journey through night, 4,000 miles from Okinawa. The crew stood by to see their charges loaded into ambulances. They watched the boy in the big cast carried off and the very odor came off the plane with him. The casts on his legs were mottled green. He was blond and his eyes were open in a blank stare. They hurried him away to save his life.

Hawaii's warmth is tempered by a lovely breeze. The smell of sea is an essence of everything clean. Yet, the odors of war are sometimes indelible upon the mind.

Norway's Airdromes

The Luftwaffe's finest airfields were in Norway and not in France or the homeland, a study of German airbases has revealed. The recent survey was led by Col. Karl B. Schilling, commander of the 9th Engineer Command, who has observed German aviation engineering technique on many captured bases on the Continent and in Scandinavian countries.

In Norway excellent facilities and dispersal areas were found, and long runways, built in 1940 and 1941, were constructed of heavy concrete. Col. C. M. Spainhour, deputy commander for operations, described them as the Nazis' "best airfields seen in Europe, far surpassing those built by the Germans in France and in their own country."

Features of some Scandinavian fields were runways made of wood, airfields with barracks and housing facilities electrically heated, and camouflage methods that made plane-crowded hardstands appear empty to aerial observers.

Wooden runways were found at an airdrome in a section of Norway where labor and timber were plentiful. Made of planking and fastened to stringers by wooden dowels, the runways were reported as extremely serviceable but inclined to be slippery in wet weather .The abundance of water power in Norway makes electricity plentiful and inexpensive, and consequently it was widely used for heating purposes in the otherwise fuel-scarce country.

Camouflage methods used by the Germans were so successful that many fields,

"I don't care if you are worth 36 points to me, you're still gonna' learn to fly!"

presumably used for operations against England and arctic supply routes to Russia, were virtually untouched.

Jack-of-All-Grades

The AAF Hospital Liaison Officer is a man of many parts. He is a pleasant combination of chaplain, commanding officer and first sergeant. He can be as gabby as a Hot Charlie, as self-confident as a guardhouse lawyer, and as shrewd as a squadron conniver. His is a new kind of job; he is on his own and he will get into trouble quicker for doing nothing, than for assuming authority.

The AAF has assigned hospital liaison officers to all general hospitals. About 250 officers and men are now in the HLO program and more are being assigned. It is a voluntary service and a man must like the job before he is finally assigned. At large general hospitals the AAF assigns one HLO, two enlisted men and a secretary. To small station hospitals an enlisted man is assigned to live within the hospital. The jobs they do are as varied as human nature.

The primary duty is to give individual attention to members of the AAF. The HLO officer or enlisted man does not go into medical matters, but after an air force man has received definitive treatment the HLO can designate which convalescent hospital the man should be sent to.

The HLO is the walking delegate for any AAF patient who needs help with his personal affairs. If a soldier thinks he is entitled to an additional battle star, it is the duty of the HLO to get it for him, or determine from proper authority that it is not due. The HLO is there to straighten out all matters of back pay. He arranges air transportation, leaves, furloughs, even dabbles in family troubles at times. Nothing daunts the HLO. Whatever his rank, a patient can take his problem to the HLO.

Consider the case of the master sergeant at Brooks General Hospital in Houston, Texas. The sergeant was being discharged on points, and his wife was having a baby. It looked like it was going to be a tie, or worse, the baby might come the day after the sergeant was released. In that case the medical care for the wife and child would have to be paid by the family. The AAF hospital liaison officer took up the case for the soldier. For a time it looked as if nothing could be done to hold up the man's release. The HLO took it to the commanding officer who kept the sergeant in the Army an extra day. The baby was born, and the father was discharged the following day.

At Bushnell General Hospital in Brigham City, Utah, the record of T/Sgt. Joseph Ford is an enviable one. Serving on the HLO staff of Capt. Robert E. Wallen, the sergeant revealed the joys of air travel to AAF men and other forces alike. In a six months' period Ford arranged free air transportation for 1,600 men through the ATC at Hill Field, Ogden, Utah. He obtained 1,300 sick leaves, 100 emergency furloughs and 25 trips to Hawaii.

"We arranged air travel for ground force men just the same as AAF men," Ford said. "It made a mighty fine impression on them, too. Most of them would say, 'Boy! That's the air force for you!' "

Postwar ATC

Lt. Gen. Harold L. George, commanding general of the Air Transport Command, has revealed that under present planning, a nucleus of the ATC is expected to remain as a permanent part of the Army Air Forces but that within a year the Command may be cut down to 500 planes or less, provided commercial airlines expand as rapidly as anticipated. The ATC's 3,400 planes now fly world-wide routes which total more than 166,000 miles.

General George predicts that in the future, commercial airlines will operate 4,500 planes in the United States alone, as compared with an estimated 600 aircraft now flown on domestic and foreign routes. The expansion may require four or five years, but if it is reasonably rapid the ATC may cut down eventually to 250 planes.

The general said he regarded commercial airlines as a permanent "backstop" for the military air transport organization and added that it is vital for the welfare of the country that strong commercial airline systems be established, both for domestic and foreign use. He considers the commercial companies as trail-blazers for the military organizations, both in the manufacture of new types of planes and in developing flying techniques.

The postwar Air Transport Command can be primarily useful in three ways, according to General George: (1) to advance special research which will be useful to military air transport; (2) to encourage the commercial companies to incorporate any features of potential military usefulness into the designs of their craft, where it can be done without hampering commercial operations; and (3) to provide special air service for the occupied countries and for out-of-the-way bases in instances where it would be uneconomical for the commercial lines to meet the needs.

General George pointed out in this connection that there are remote military bases in both the Atlantic and Pacific which probably will be maintained, and that it is not likely that there would be any demand for commercial planes to operate into these bases, thus leaving such transportation as a future job for military craft. All these future decisions, the general pointed out, were speculative and dependent upon action ordered by the War Department, with the approval of Congress.

TAD Decentralized

The Training Aids Division, of the Office of the Assistant Chief of Air Staff, Training, was decentralized on September 1, with its functions divided primarily between the Training Division of AC/AS, 3, and the Air Technical Service Command under supervision of AC/AS, 4.

An AAF letter and two AAF regulations signify the change and also clarify further responsibilities of AC/AS, 3 and 4 with regard to training aids and the supply and maintenance of training aids. These are AAF Letter 20-18, "Discontinuance of the 4th AAF Base Unit (Training Aids)," 18 August 1945; AAF Regulation No. 50-19 (Revised), "Training—Training Aids," 1 September 1945, and AAF Regulation No. 65-106, "Supply and Maintenance—Training Aids," 23 August 1945.

Because of the reorganization, correspondence on training aids should be forwarded in accordance with regulations as follows: on training films, in accordance with regulations; requisitions for film strips and target films to ATSC Training Film Unit, One Park Avenue, New York 16, New York; requisitions for supply of all other training aids (not on allowance tables) and requests for establishment of all training aids projects to Commanding General, Air Technical Service Command, Dayton, Ohio. ☆

40-206950B	42-167071I	42-412035F
41-11871G	42-187852G	42-420932F
41-13855F	42-191752F	42-443617B
41-28066B	42-291829A	42-464907G
42-4230H	42-293117F	42-779096G
42-1037178D	42-342286E	42-780065B
42-137584D	42-38754B	42-795823A

Return to field indicated by letter after number as keyed below

A—Ferrying Division—ATC, Fort Dix Army Air Base, N. J.
B—AAF Proving Ground Command, Eglin Field, Fla.
C—Lockbourne Army Air Base, Columbus 17, Ohio
D—Coffeyville Army Air Field, Coffeyville, Kansas
E—8th AAF Base Unit, Winston-Salem, N. C.
F—Ferrying Division—ATC, Rosecrans Field, St. Joseph, Mo.
G—Headquarters, Luke Field, Phoenix, Ariz.
H—Moody Field, Ga.
I—Big Spring Army Air Field, Big Spring, Texas

HOW SHARP ARE YOU?

QUESTIONS

1. Where is a ladder?
2. What number appears on the airplane?
3. There is a metal container on the crew chief's stand. True or false.
4. What airplane is shown?
5. Not counting the compressor, how many metal containers are in the picture?
6. One of the engines is minus a propellor. True or false.
7. How many men are standing on the crew chief's stand?
8. How many men in the picture?
9. One man is wearing a helmet. True or false.
10. The bomb bay doors are closed. True or false.

ANSWERS ON PAGE 57

Big moment at Ie Shima. Wheels down, the first of two Jap bombers carrying surrender delegation prepares for landing on island strip.

Hundreds of officers and GIs from the garrison at Ie Shima airstrip are on hand as the first white-painted Betty taxies to a stop.

Americans waste little time in transferring Japs to ATC airliner.

Unsmiling Japs, bedecked with samurai swords, carry own baggage.

Glum after the icy reception at Ie Shima, Japs make ready to board the

Japanese surrender delegation proposes to say it with flowers. Several crew members bring bouquets to Ie Shima as token of "peace and friendship." Americans curtly refused them.

American airplane that will fly them to Manila on final lap to surrender conference.

Ie Transfer

PHOTOS BY SGT. NORMAN L. PRATT, 4TH AIRCRAFT MAINTENANCE UNIT (F1)

The crowd around the airstrip at Ie Shima stood quietly in the noonday sun observing the unfolding of history with the impassive curiosity of village idlers watching the unloading of a circus at the railway depot. When the two white-painted Betty bombers with their green crosses rolled to a stop, officers and GIs sought to capture the moment with scores of cameras.

There were no smiles, salutes or handshakes. In the cold formality of the recepton bouquets of flowers carried by one of the surrender party became incongruous baggage.

Maj. Gen. Charles A. Willoughby and his aides lost little time in hustling the Japs aboard an ATC C-54 with plush seats in which they rode the final lap to Manila. At the Philippine capital, the Japanese representatives received curt instructions on how their beaten nation must carry out the unconditional surrender. In a matter of hours, they were back at Ie Shima and aboard their Bettys for the return to Tokyo. At Ie there was a final touch to their ignominious journey. One of the Jap bombers piled into a ditch on take-off. But no one was injured, and the orders they carried back with them were the basis of Japan's formal acknowledgment of defeat aboard the battleship Missouri on September 2. ☆

AAF QUIZ

Here is something new in AIR FORCE brain twisters. Beginning this month, every question in the AIR FORCE Quiz will be based on information contained in the preceding 12 issues. If you have been reading AIR FORCE carefully, this should be easy. See Page 61 for answers.

1. The XCG-10A and XCG-16 gliders are characterized by
   - A. *Built in radar equipment*
   - B. *Retractable landing gear*
   - C. *Boom tail design*
   - D. *Biplane construction of wings*
2. An anchored R-4 helicopter being used to study the effects of ice on rotor blades is located at
   - A. *Eglin Field, Fla.*
   - B. *Ladd Field, Alaska*
   - C. *Mt. Washington, N. H.*
   - D. *White Face Mountain, Vt.*
3. Sharp spikes inserted in the nose of demolition bombs were used to great advantage by the AAF in Burma to destroy
   - A. *Railway tracks* B. *Oil tanks*
   - C. *Wooden shipping*
   - D. *Targets located on steep hillsides*
4. The XR-8 helicopter features
   - A. *Three engines*
   - B. *Jet propulsion*
   - C. *Dual interneshing rotors*
   - D. *Pressurized cabin*
5. High speed, jet propelled aircraft necessitated a new rate-of-climb indicator with a dial range of
   - A. *0 to 15,000 feet per minute*
   - B. *0 to 20,000 feet*
   - C. *0 to 6,000 feet*
   - D. *0 to 10,000 feet*
6. Johnston Island, ATC stop between Hawaii and Kwajalein, is approximately
   - A. *10 miles long and 1 mile wide*
   - B. *1 mile long and ¼ mile wide*
   - C. *84 miles long and 22 miles wide*
   - D. *Crescent shaped; 3 miles long and a mile at the widest point*
7. AN/APS-13 indicates a
   - A. *Plane used by both Army and Navy*
   - B. *Rating of an air navigation specialist*
   - C. *Warning set*
   - D. *Section of Hq of an air force*
8. The Aeronautical Division of the Office of the Chief Signal Officer, forerunner of organizations that grew into the present AAF, was established in
   - A. *1901* B. *1907* C. *1914* D. *1916*
9. A dynamometer is a
   - A. *Power unit in a jet engine*
   - B. *Dial for measuring explosives*
   - C. *Instrument for measuring power*
   - D. *A portable dynamo*
10. In overseas movement of B-29s, Mather Field was most important as a
    - A. *Port of Aerial Embarkation*
    - B. *Engine repair depot*
    - C. *Practice bombing range*
    - D. *B-29 flight engineer school*
11. The AAF has used pentothal sodium as
    - A. *Cylinder cleaner*
    - B. *Binder for airstrip surface*
    - C. *Dope for life rafts*
    - D. *Sedative for personnel*
12. "Gasparcolor" is a new
    - A. *Color code for poison gas.*
    - B. *Process for color-printing photographs*
    - C. *Close coordination attack marker*
    - D. *Overtones on a radio intercom*
13. "Trimetrigon" is
    - A. *Three-winged aircraft*
    - B. *Term used in aerial photography*
    - C. *Land-sea-air attack*
    - D. *Trigonometry applied to measure gas consumption*
14. A man may wear a battle star for "Sicily" if he served in air operations in Sicily and adjacent waters in the period
    - A. *January 1—March 15, 1943*
    - B. *May 14—August 17, 1943*
    - C. *August 20—November 1, 1943*
    - D. *Anytime in 1943*
15. Service in the WAAC is counted for longevity pay of a Wac
    - A. *True* B. *False*
16. The "L" P-38 has a maximum ferrying range in miles of about
    - A. *3,000* B. *4,000*
    - C. *2,800* D. *1,900*
17. The P-61 can carry a bomb load equal to that of a B-25
    - A. *True* B. *False*
18. The aircraft repair "Floaters" in the Pacific were
    - A. *Helicopters*
    - B. *Maintenance submarines*
    - C. *Specially equipped barges*
    - D. *Converted Liberty ships*
19. PB-4Y2 is a Navy adaptation of
    - A. *B-24 with single rudder*
    - B. *B-24 with two engines*
    - C. *B-24 with a gull wing*
    - D. *B-24 for amphibious landing*
20. Identify this airplane.

THIS WAS IT

(Continued from Page 6)

men and girls were counted, kept shouting, "There's always room for one more!" And in the camps and hospitals of the AAF the world over, wounded men cheered, embraced their nurses and wept for joy.

But despite the hilarity, many a soldier paused in contemplation, sobered by the memory of the many thousands of Americans who fell along the long road to total victory.

"The first thing I thought of was my two brothers," said one member of a fighter group still in Europe. "One of them was wounded on Okinawa. The other is a Marine. Now both of them will be coming home—safe."

Chaplains led prayers of thanksgiving. In Chungking, Chaplain John S. Kelley prayed for the deceased members of the 14th Air Force, and expressed the hope "that they will not have died in vain." Maj. Gen. Charles B. Stone III, commanding general of the 14th Air Force, called the men to attention while an officer struggled with a wheezy old pump organ to render the "Star Spangled Banner."

Once the first blush of the great news had worn off, AAF men everywhere began to talk about point totals, going home and eventual discharge. "Sure, we're happy about this news from the Pacific," said a sergeant of the 9th Aviation Engineers, "but we're more interested now in finishing up this job so we can start packing for the last time. It ought to speed up our return to the States." His unit was still building airfields in France.

By a strange quirk, peace, when it finally arrived, came gently to the battle-scarred islands of the Pacific where the war had raged fiercest. On Guam, for example, August 15 brought no snowstorms of ticker-tape, no wild firing of ack-ack guns, no torchlight parades and drums. The whole island just seemed to breathe an audible sigh of relief at the long awaited news.

Most of the AAF men on Pacific islands had been out there since the beginning. Many wore the European Theater ribbon as well. All of them had been surrounded by war so long that the sudden ending left them a little dazed and uncomprehending as to what peace really meant.

"It will seem incredible to have the B-29s idle on the field," muttered a medic on Guam. "So many nights we have waited for their return, watching them drop flares for emergency landings, or to show that there were wounded aboard. There hasn't been much use in dreaming before now, but at last we can think of what the most beautiful girl in the world—American—looks like in a bathing suit."

It was apparent to all that for many the trip home would be made via Tokyo. Emotions on this subject were mixed; many men wanted to get a good look at the empire they had been working to destroy. But for the most part everyone wanted to get home, and fast.

Getting home really was the guts of the thing for the men of the AAF wherever they were. ☆

Pick-up by Helicopter—Page 51

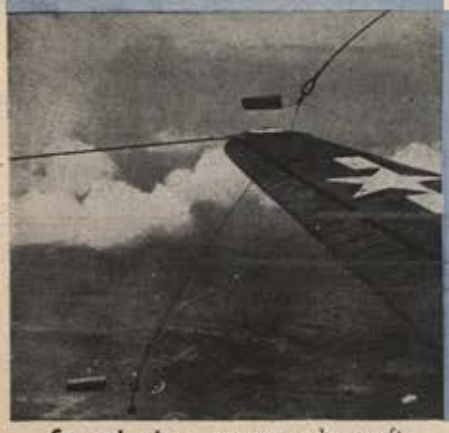
technique

Development, Maintenance and Supply
of Aircraft and Equipment

A glider tow mechanism and a line is fixed under plane to be towed.

On the other plane, a hook and line arrangement is pinned to wingtip.

As damaged plane loses altitude, the sleeve-stabilized towline is dropped.



Second plane passes under craft with wingtip hook catching line.

Hook disengages itself on contact and cables lock to complete towline.

Plane Pick-up in Mid-air

As a development of glider tow methds, an aerial pick-up system recently enabled a damaged plane to be saved from a crash landing and towed back to its base for repairs. A pick-up hook was mounted on the left wingtip of the towplane in full view of the pilot, and when he saw a member of his formation in trouble he maneuvered his plane so that the hook made contact with the 250-foot weighted nylon rope which the disabled plane's crewmen had tossed overboard. The wingtip hook was held in place by a soft alummum pin which broke off under the air load when contact was made and swung out behind a conventional glider tow release mechanism to which it was attached by a short length of nylon rope. The pilot of the towplane could release the injured craft at any time after the pick-up, just as he would cut loose a glider.

No radio communication between planes was needed, and all the pilot of the assisted plane was required to do to effect a successful pick-up was to maintain a straight and level course. If the speed of the planes was correct—no more than five mph difference between them—the elasticity of the nylon would absorb the shock and the entire operation would be almost unnoticeable. After contact, the towplane maintained a straightforward direction relative to the towed aircraft, and while there was a tendency for the tractor plane to become nose-heavy, trim could easily remedy this.

The system was first tried in April of this year at the Clinton County Army Airfield, Wilmington, Ohio, where the aerial pick-up was attempted with two C-47s, one of which played "wounded" by cutting out an engine. A standard glider tow release was located below the fuselage near the center of the wing, and the nylon rope was stowed inside a dural sleeve that acted as a stabilizer during trailing. The other C-47, which had the pick-up hook on its wingtip, maneuvered into position, made contact with the dangling rope and continued on its flight towing its sister ship behind it.

Since that initial try, many pick-ups have been successfully completed, including one in which a C-47 had both engines shut off and props feathered The originators of the method, engineers of the ATSC Aircraft Laboratory, Glider Branch, believed that the system is applicable to all bombardment aircraft, including B-29s

Glider Deceleration

In their study of various devices to bring gliders to a stop after landing, glider experts are conducting experiments with rockets and parachutes.

The most spectacular system is the rocket arrangement, in which two solid propellent rockets are slung on strut attachments under the wings, one on each side. Each rocket is capable of producing approximately 1,200 pounds of reverse thrust power and is fired by the pilot at the instant the glider touches the ground, bringing the craft to a stop in one-half the normal landing run The rockets employed are of the smokeless type and the whole installation weighs less than 100 pounds.

The use of a parachute as a brake is quite common, having been previously applied to power-driven planes. For gliders, however, a 24-foot or 28-foot chute is attached to the glider's empennage, and just before the ship lands it is opened to produce a powerful drag force. Perfect timing is necessary to get the best results.

Wright Field "Newsreel"

An important part of the work performed by the Motion Picture Branch of ATSC's Technical Data Laboratory at Wright Field is the production of a semi-monthly Engineering Staff Report —a "newsreel" of late engineering developments which furnishes the generals and the laboratory chiefs with visual demonstrations of experiments and tests conducted in the field's many installations. Behind the closed doors of laboratories or up in the sky, a special staff of cameramen under the supervision of Lt. Col. R. J. Cunningham train their lenses on top priority projects—and on the "secret" or "confidential" celluloid footage that rolls through their cameras is the irrefutable picture story of the AAF's progress toward the improvement, perfection and utilization of air power.

Using a 35-mm motion picture camera during a test flight at Wright Field, photographer makes a film record of technical data.

Making the films isn't easy, nor is it always safe. Ninety percent of the photography is done under field conditions, much of it in aircraft during flight. Cameramen ride in the nose of attack planes 20 feet off the ground at 300 mph, or in the freezing air of a bomber's belly seven miles above the earth. "You never know what's going to happen during a test," explains one of the specialists. "It's like trying to get a wild lion to pose for you."

When they were filming trial launchings of the JB-2 bombs, for example, one of the robombs caught fire and failed to leave the ramp. Cameramen ducked for cover behind a concrete embankment, leaving their equipment. One of them, however, had the presence of mind to leave his camera running, and when the bomb exploded, blowing the equipment off its tripod, 400 feet of precious film were salvaged from the magazine, revealing to engineers exactly what had occurred.

All types of motion picture cameras are used, ranging from studio-type 35-mm Mitchells to tiny 16-mm GSAPs that grind away at speeds up to thousands of frames per second. Pictures are made in full color or in black and white, and sound men follow the cameras to catch the facts for the ear as well as for the eye. Large developing tanks and related equipment process 12 miles of film every 24 hours.

Heavy Freight by Air

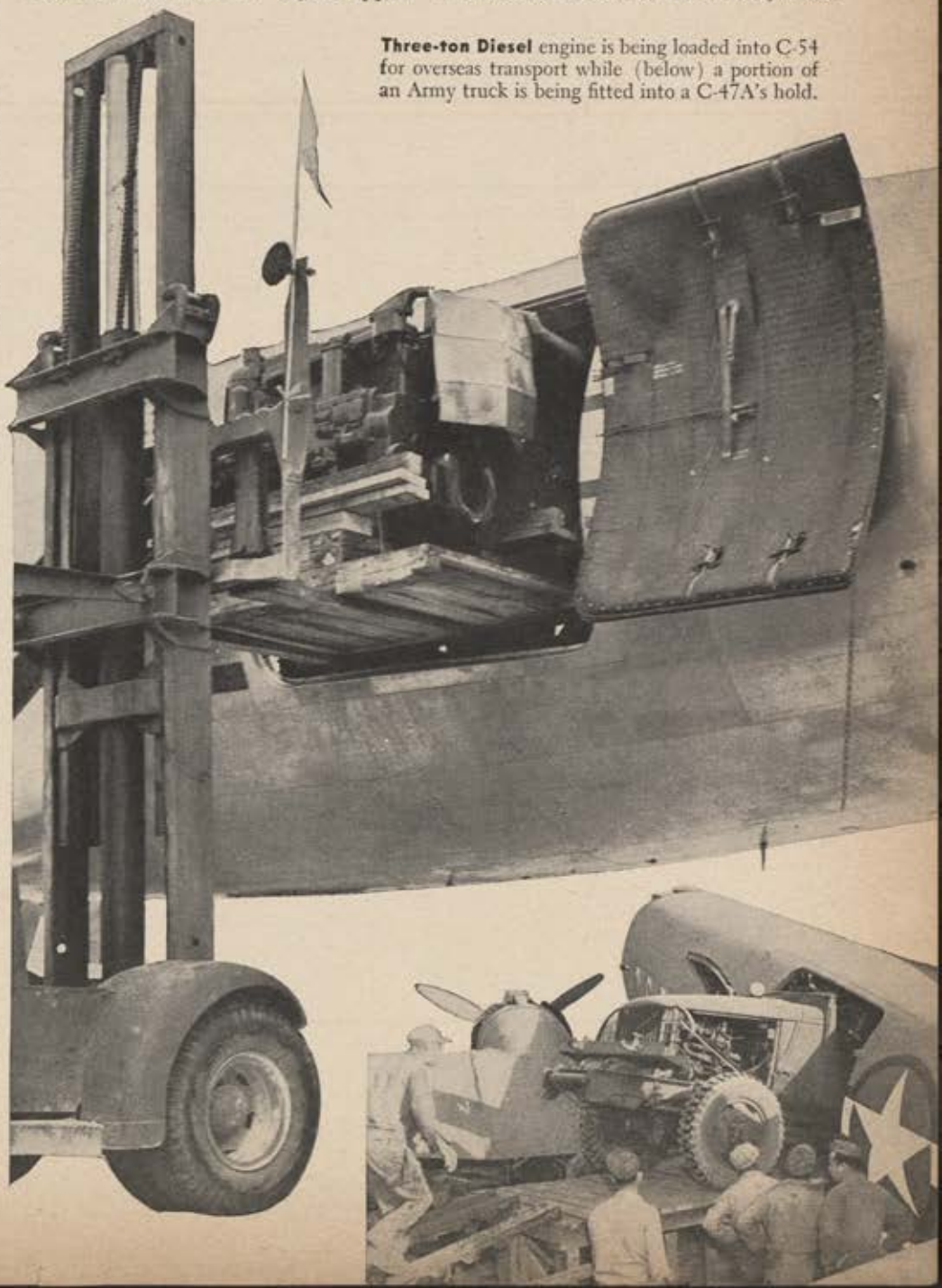
Two outstanding indications of the feasibility of transporting heavy machinery and equipment by air have recently been revealed at widely divergent parts of the globe. At Assam, Burma, a fleet of C-54s arrived with a cargo of 15 three-ton Diesel engines which had come by air from ATC's Miami, Fla., Air Field by way of Chabua, India, while at an Air Service Command base in Italy, vitally needed 2½ ton trucks were loaded into C-47As and flown across the Adriatic to Yugoslavia.

The Diesel engines were destined for Caterpillar tractors being used by Army Engineers in their construction of the Ledo Road, and by a special repacking process before air shipment, more than 1,000 pounds of weight in crating was eliminated from each individual engine. They were then built onto wooden skids to prevent slippage while in transit and loaded aboard the giant C-54s for their overseas journey.

In the Italian instance, the OSS in Yugoslavia had sent an urgent appeal stating a desperate need for heavy capacity transportation. After consultation with the Automotive Maintenance Section and the Ordnance Maintenance Company of the AAFSC/MTO, it was decided to cut each vehicle up into three or four major sections which could be loaded into a cargo type plane and which could be reassembled at the unloading point with a minimum of tools, material and time.

After securing the maximum information available concerning weights and cubage from the operations officer at a local airfield, the work of dismembering the first GMC vehicle began. All parts such as fenders, running boards, cargo bed, etc. were loaded on a truck and driven to the airfield, while

Three-ton Diesel engine is being loaded into C-54 for overseas transport while (below) a portion of an Army truck is being fitted into a C-47A's hold.



tech topics . . . about aircraft and equipment

One B-26 has been equipped with a new type of landing gear. It has two retractable main wheels mounted in tandem on the fuselage and two smaller wheels on free-swiveling mounts near the wing tips, like the floats on a flying boat, to keep balance. The gear is being tested for possible use on an unconventional aircraft design.

Something new in helicopters is the tiny G&A single-place XR-9, which the AAF now is testing for possible use as a liaison aircraft. Called the "rotorcycle," it weighs about 1,600 pounds, has a three-bladed main rotor and a small tail rotor.

Recent tests by the Aero-Medical Laboratory at Wright Field indicate that the "g" tolerance of man is not adversely affected by Benzedrine in reasonable dosage either during the time that the drug is actively producing its effect or in the period after the Benzedrine wears off. . . . A warning light, activated by gravity forces and to be located on the instrument panel, is being developed to afford the fighter pilot a positive and reliable warning when "g" forces approach the stress limits of his aircraft.

Piloting gliders behind tow-planes during blind-flying conditions is being made easier by the use of a simple position indicator on the intrument panel which tells a pilot his glider's position relative to the tow-plane at all times, even when the plane on the other end of the tow-line can't be seen. A sensitive arm-like device which lays across the tow line picks up every turn and twist of the rope and actuates the indicator in front of the pilot, recording all changes in position. . . . Use of a high-speed type flap actuating mechanism on the CG-10 glider permits raising and lowering the flaps in less time than ever before. Tests employing larger diameter tubing to carry a more powerful hydraulic charge run the flaps up or down in nine seconds whereas it used to take about 15. . . . Improved rubber shock mounts for the small engines on powered gliders have eliminated most of the excessive vibration previously experienced.

Numerous tests to determine parachute seat cushion comfort indicate that a simple, uncompartmented air-filled bladder is most efficient in preventing soreness for the buttocks. Under development is a bladder covered with a canvas duck material. A bulb-valve system permits regulating amount of air in the cushion, hence providing "personalized" comfort to the individual's liking.

Tests recently completed using a fluorescent sea-marker chemical as an anti-sunburn lotion indicated that protection

offered is negligible. Aero-Medical experts recommend that it not be used despite previous experience.

Under development is a light and compact pressure demand oxygen regulator for use with bailout oxygen equipment. Essentially it is a miniature demand oxygen system that automatically forces oxygen into a flyer's lungs during bailouts from high altitudes. . . . A coiled aluminum-tubing oxygen container also is being developed experimentally as part of the bailout oxygen assembly. The new container, made of one-half inch aluminum tubing coiled into an eight-inch diameter "pancake," can be located inside a conventional parachute pack, eliminating the need for special bailout bottle pockets in a flying suit. . . . A small Oxygen Servicing Trailer (Type E-2) has been standardized for use in the field to recharge oxygen systems of heavy and very heavy bombardment type aircraft. Constructed of tubular steel, the trailer can be towed by a jeep, tug or truck over all types of terrain. . . . Because leather and cloth in the H-1 goggle are subject to mildew and deterioration in the tropics, a carrying package made of vinyl chloride, evacuated of air and heat sealed, is being included in the B-4 emergency kit and the C-1 vest. This affords ample protection against mildewing and tolerates exposures to high altitude pressures without bursting.

A new cockpit panel lighting system has instruments mounted in tiers with each tier lighted by a small light extending the length of the panel. This affords illumination of the instruments without reflections on instrument dial faces and without causing stray light in the upper areas of the cockpit. . . . Cylindrical filters to provide fluorescent or colored light can be fitted over the light and rotated to control brightness.

the two chassis components were towed, with a supply of gasoline, oil and hand tools being included. On arrival at the field, a loading ramp and platform were set up alongside a C-47A. The forward component of the truck was driven into the plane under its own power, and the platform was then moved to another plane and the rear section was loaded, with loose parts being fitted into unoccupied space in the two cargo carriers. A third plane was used to transport loading platform and ramp, hand tools, fuel, oil and personnel.

Experimental Warplanes

With the war at an end, the same proverbial pat on the upper fuselage accorded to the combat planes of the AAF may well be given to those experimental models which served as prototypes or forerunners of operational aircraft. Three of these, the XA-38, the XP-47J and the XP-58, can resume their inactive status with pride in their accomplishments and the feeling of a job well done.

P-47J (top) was used to determine speed and flight characteristics of new Thunderbolts. XA-38, an experimental attack bomber (center) featured 75 mm cannon in nose, while larger Lightning (right) designated XP-58, offered data for heavier, two-man fighters.

The XA-38 was a new departure in attack planes, having been built around a 75 mm cannon. Designed by Beech, the craft carried a pilot and a gunner and mounted six .50 caliber machine guns in addition to the big gun. Power for the plane came from two radial, air-cooled R-3350 engines, each capable of producing more than 2,000 hp, and although the plane was never out of the laboratory stage, it proved extremely speedy for its 29,000 pounds. Having no bomb bay, all bombs were carried in externally-hung wing racks.

The XP-47J was the guinea pig plane that led to the production of the P-47M and the long-range P-47N—both of which distinguished themselves in Pacific combat—and has proved its value many times over in furnishing information on power plant, airframe and turbo-supercharger modifications. In outward appearance the plane looked little different from an ordinary P-47D. Internally, however, it incorporated many engineering innovations that were calculated to make it the fastest plane ever built in this country, except for the P-80. Weight was cut 1,000 pounds with the adoption of a new wing construction which eliminated some ribs and structural members, while still retaining strength and rigidity. The engine cowling diameter was reduced to cut down on drag, and a fan was installed in front of the 2,800 hp engine to suck air in over the cylinders and to cool the engine for maximum altitude and maximum climb performance.

The XP-58, conceived as the logical development of the Lightning and intended as the forerunner of faster, heavier, two-man fighter planes, was a twin-boom model half again as large as the P-38, which could throw its 34,000 pounds around the sky at better than 400 mph. A remote sighting arrangement operated the upper and lower turrets in the manner of the A-26, while a 75 mm cannon was originally planned for the nose.

Pick-up by Helicopter

Using a new personnel pick-up device, helicopters engaged in rescue work can now lower a boatswain's chair to a stranded airman and hoist him safely into the cabin. A small, hydraulically driven winch, a line boom with pulleys, 150 feet of steel cable, and the seat are all necessary extra equipment.

The pick-up mechanism, installed on a rigid boom, is assembled forward of the main rotor support arm and is operated by push-button controls on the stick. With the helicopter hovering at a convenient height, the pilot pushes the "Down" button and the winch lowers the boatswain's chair. The man on the ground then climbs in, fastens a belt and signals to be hauled aloft, whereupon the "Up" button is pressed and he is reeled in at the rate of 1½ to 2 feet per second until he is in a position to climb aboard. (See Technique cover.)

The rescue gear weighs about 75 pounds and can lift 500 pounds.

Trailerized Flight Line

A completely mobile, compact and efficient repair unit for the maintenance of heavy bombers was in operation at a 7th Air Force B-24 base in the western Pacific. Built by ground crewmen, the flight line on wheels was composed of at least 10 trailers, housing engineering, armament, ordnance, communications, sheet metal, instrument repair, propeller and electric shops. Tires and wheels of Japanese trucks left behind by the enemy comprised the chassis, while the bodies were made of plywood.

Each phase of maintenance is carried out by separate trailer in this mobile flight line. Above, 7th AF sheet metal men are at work.

Almost all technical equipment needed for the maintenance of Liberators, except engines and wheel assemblies, could be packed in the trailers and made ready to move within 24 hours after an alert. And when B-24s arrived at an advance base which was lacking in facilities for maintenance, the trailers could be pulled into a space near the planes and the wires connected to the portable generators.

B-29 Comfort and Safety

Superfortress modifications recommended by the ATSC Aero-Medical Laboratory to increase the comfort and safety of crewmen—including a means of minimizing decompression dangers, a more suitable seating arrangement for side gunners and revised construction of the tail gunner's compartment—have recently been incorporated in B-29 production programs.

Early models did not have doors in the communication tunnel above the bomb bay, and during unintentional decompression periods, air approaching the velocity of a 140-mph gale blew through the passageway, endangering personnel. To prevent crew members from being sucked against the tunnel wall, a door has been added at each end of the tunnel to seal it off under all conditions of decompression. Both doors are closed at all times during flight except when entrance into the tunnel is desired.

To make things easier for the blister gunner, his compartment has been widened about eight inches and an extra seat has been provided which swings out when he desires to use it. Although he still uses the upright chair-type seat during take-offs and landings, he can

maintenance tips . . .

from the crew chief's stand

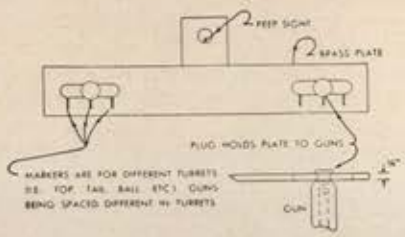
When an aircraft engine has to be shipped by air, a special mount may be made out of steel tubing which can be fitted to the floor of the cargo plane to retain the engine securely during transport. After bending the ring to shape, drill holes for the engine bolts and weld on legs and braces. Idea was submitted by men of 2nd Base Air Depot, Blackpool, England, who had mass-produced the mounts for redeployment.

Reports from the Philippines indicate that the two-position toggle switch for turning on starter motors in A-20H-10 and A-20H-15 planes were sticking in the "on" positions and were failing to return to the "neutral" position, thus resulting in the burning and loss of starter motors. Suggestion from Sgt. Clarence J. Wytas, electrical specialist with a bomb group of the 5th Air Force, would remedy malfunctioning by a simple modification to the switch. Fasten two small pieces of spring steel to the upper and lower portions of the switch face-plate so that the free ends rest against either side of the switch lever to exert equal spring tension. Any movement from "neutral," therefore, increases spring tension in that direction, and upon release, the lever is forced back to the "neutral" position. Photo shows toggle switch as modified.

The papier mache "bolero" tanks used in C-47 cabins for long overwater journeys may be replaced by the Skymaster's metal wing tanks which in turn are being abandoned in favor of self-sealing tanks. According to M/Sgt. Merrill A. Shaw, a squadron line chief in the 434th Troop Carrier Group, the metal wing tanks can be installed by using the same wooden cradle, valves and tubing employed in the bolero tank installation, and have many advantages over the latter. There is a saving of approximately 50 percent in cabin space, 200 additional gallons of gas can be carried in the three metal tanks, light baggage and equipment can be stored on top of them, and it is estimated that eight to ten passengers and their baggage can be carried on a 2,000 mile flight, as against the three passengers that could be accommodated under the former system.

"While serving with the 5th Air Force in the Southwest Pacific," reports S/Sgt. Dillard E. Payne, "I found that the A-2 and A-3 rubber life rafts are often damaged by insects. By spraying the rafts with DDT insect spray from the vapor bomb, I was able to insect-proof the rafts effectively. No damage resulted from such treatment, and a single spraying was effective for several weeks."

To boresight and harmonize turret guns on combat aircraft, make a template out of ¼" brass plate, slotted at each end with markings to indicate the spread required by each set of guns. At the center of the template, fasten an upright in which is drilled a hole large enough to permit unobstructed sighting. To use, place the template on the gun barrels so that its scaled surface faces the turret After the desired spread is obtained, sight



the guns by aligning a distant object with the turret sight through the opening in the center upright of the template. S/Sgt. Joseph Felzer, a 50-mission veteran of a B-24 crew in Italy, who originated the system, says that as long as you are certain that all guns are at a 90-degree angle, every Liberator turret except the ball turret can be harmonized in 45 minutes.

shift to the auxiliary seat or use a specially padded knee rest to continue his scanning of the skies during flight. A second safety belt permits him to change his position at will, affording comfort on long hops.

So that an injured tail gunner may be extricated from his compartment during flight, four wing-nuts make it possible to remove a U-shaped doorplate through which a man can crawl, while the removal of hinge pins will take the door off completely. A release handle lowers the seat so that the gunner falls backward and off the stool in a sitting position, after which the seat can be shoved out of the way and the man pulled from the cramped compartment.

Fire Fighting Aids

Several modifications to existing equipment have been developed at Eglin Field, Fla., and at Fort Worth Army Air Field, Texas, to prevent fire hazards and to serve as emergency fire fighting apparatus.

At Eglin Field, the danger of fire in

Jeep is equipped with radio, fire-fighting and fence-cutting apparatus, is directed to fire by plane, uses direct, overland route.

oil servicing trucks caused by dripping oil in the hose compartment has been effectively forestalled by a non-drip servicing nozzle, recently tested and approved. The heavy duty nozzle will deliver 10 gallons of oil or 30 gallons of gasoline at an average temperature of 70 degrees F. It is easily cleaned and has a removable spout which can be replaced in the event of damage. Also, the handle has been changed to a more desirable design.

At Fort Worth, the speedy, dependable jeep has been converted into a most useful piece of airplane crash fire fighting equipment. It carries a supply of fire extinguishers and forcible entry rescue tools to rescue flying personnel, while a two-way radio permits contact with the control tower and the search airplane, which directs the jeep to the scene of the crash by the most suitable route. On receipt of information over

the crash alarm circuit, the jeep proceeds directly overland to the crash-fire, disregarding terrain obstacles that would bar heavier trucks and passing through fences by means of a special type fence cutter mounted on the front. The vehicle is painted "fire department" red, permitting easy identification by the guiding plane.

B-29 Training in Liberators

When the Superfortress was still a "whisper ship," a program was started at Sheppard Field, Texas, to train B-29 flight engineers. Since one of the big planes itself was not available, due to the urgent need elsewhere, it was initially decided to modify a C-87 as a flying classroom in which six student engineers at one time could study four-engine manipulation and cruise control. With production begun, the entire project was moved to Smoky Hill AAB, Salina, Kans., and later to Lowry Field, Denver, Colo., where plans were made to build four more planes like the prototype model. In May of 1944, however, word was received that no more C-87s would be available for training purposes, and it was necessary to seek out a satisfactory substitute.

Accordingly, the B-24J was decided upon as the future trainer, and a prototype plane was designed and handmade in a period of six weeks. The new modification consisted of two instrument panels being placed in the aft compartment behind the bomb bay and another mounted behind the pilot. The

Interior view of B-24 after it was modified to accommodate nine students for training as aerial flight engineers in Superfort crews.

master control station in back of the pilot was placed in backward and throttles and mixture controls were connected directly to the master control station through a series of pulleys and cables. All turrets were removed and the bomb bay was closed, with all hatches and openings being covered over with ¾" plywood flooring. Eight seats and tables were then installed, giving the plane a capacity of nine students, one instructor, a crew chief, pilot and copilot and radio operator. For entrance and exit purposes, the forward right bomb bay door was left connected.

During the months of January and February, 1945, about one trainer per week was completed. Later, however, a production line was set up in which a TB-24 was turned out every three working shifts, or one every one and a half days. The entire project was completed in May, 1945, after two years of planning, procurement and production. Every flight engineer on a B-29 has been trained on one of these planes.

Instrumental in performing the modification were Maj. Joseph H. Frost, Maj. Robert W. Ray, 1st Lt. Georgell Hollingworth, S/Sgt. Jack A. Barnes, S/Sgt. Charles A. Saunders, Sgt. Harold E. Habicht, Pfc. Carrol G. Holzworth and Pvt. Roland P. Strasser.

Aerial Robomb Launcher

With a beefed-up wing and a special rack installation that permits two JB2 robombs to be slung under its wings, the B-17 has become an aerial launching platform for the AAF's buzz bombs. A remotely operated fuel valve regulates fuel feed to the projectile's engine, and a control panel, located in the bombardier's compartment, governs starting and launching. There is also an emergency release in the form of an explosive device which blasts loose the hold-on pin and allows the bomb to fall away.

With the robomb in place, the B-17 takes off in less than a mile of runway, with flight performance only slightly reduced and with little effect on maneuverability. During a launching, the bomber climbs to the proper altitude and the bombardier opens the air valve on the bomb, which pressurizes the fuel tank, runs the JB2 autopilot up

what's wrong with this picture?

Rubbing down a plane looks like a soft mission, but unless you brush up on TO 0-1-1, you're likely to make it a complete wash-out. The bucket brigade shown here is all-wet nine times over, but don't shoot off steam on page 55 before you spot another stain or two on their record. The scrub-team—who are posing in good, clean fun—are S/Sgt. Sidney S. Jacobs, S/Sgt. Harold Expensen, T/Sgt. Murt Bedgood and M/Sgt. D. J. Riser, all of 4000th BU, Wright Field.

With a robomb slung under each wing, Flying Fortress becomes aerial launcher. Flight performance is only slightly reduced.

to speed and delivers air to the pneumatic servos. When the plane reaches a speed of 200 mph or more, the jet engine of the robot device is started and allowed to run for about 50 seconds. Then the bombardier trips a simple release mechanism, the bomb drops approximately 500 feet and levels off on its pre-set course.

All materials necessary for modifying the B-17 for this purpose have been included in a special modification kit which was sent to overseas units.

Glide Path Tester

The versatile helicopter now is being used at Wright Field as a test apparatus for calibrating the radio signals of the Instrument Approach and Glide Path Landing systems that bring planes in 'on the beam' for safe touchdown in zero-zero weather. In its new role, the "eggbeater" serves as a flying elevator that enables engineers to find out how far above or below the glide path signals could vary before indicating deflection. By hovering at various levels with a test observer aboard it is possible to study frequencies received during foot-by-foot descent, thus gaining valuable data on descent angles of the beam and the most effective antenna mast setting for more efficient instrument landings.

As explained in the October, 1944, issue of AIR FORCE, the glide path intersects a radio signal that has been sent out to home the plane from a point 15 miles from the runway, and provides a beam on which the pilot can descend through overcast for a blind landing.

XL-13—All-Metal Grasshopper

First of the AAF's light planes to be made entirely of metal, the Stinson XL-13 is a bigger, more powerful liaison aircraft. It has provision for two litters and can carry an overload up to six passengers in a special seating arrangement, while complete radio equipment permits flying in almost any kind of weather, and a small camera hatch facilitates photographic work. In addition, removable panels in the fuselage enable cargo to be dropped through the door of the cabin, and an opening in the floor permits pick-up cargo to be hauled aboard with greater ease than has hitherto been possible. Litters go one above the other along the right side of the plane and are braced by small swinging doors forward and rear.

The XL-13 has a wingspan six feet greater than that of the L-5, and its wing profile differs from that of the other liaison type by having leading and trailing edges parallel at the base and a sharp taper at the trailing edge along the wing tips. The wing has a large flap area on its inner panels, while slots along the leading edge outer section help to make short take-offs possible and slow up landing speed. To make ground handling easier, wings can be folded back and the craft loaded onto a 2½-ton truck for transportation where needed.

A 245-hp Franklin engine drives a small wooden propeller which has controllable pitch blades. The cockpit has dual controls, with wheel-type control columns being used instead of the familiar joystick arrangement. The throttle is a small knob in the center of the instrument board, and the panel is equipped for all the standard flight instruments for blind flying, including a radio compass.

The fuselage of the XL-13 is that of a conventional light plane, except that a tail cone, similar to that on the XR-6 helicopter, supports the empennage. Landing wheels have a spindle arrangement on the vertical strut which makes it possible for the plane to be hauled, trailer-fashion, by a jeep.

Bombing Mission Recorder

So that a permanent record might be maintained of bomber missions a 32-pound wire-recorder was strapped into the plane to preserve the actual sound and description of a bombing run or aerial attack just as it happened. The instrument is able to "play back" immediately after a recording is made.

Recorder plays back sound and description of bombing mission or enemy air attack as it happened. Cpl. Jean Denter holds mike.

Modifications to Navigation Aids

Three devices have recently been developed as improvements to navigation equipment, which were designed for use in all theaters of operation.

Capt. Quentin R. Edwards, who was General Chennault's personal navigator in China, has devised a simple plexiglas navigation instrument which he calls the Time Mileage Plotter. Consisting of a combination Weems plotter and a time, rate and distance computer, the instrument is constructed on a scale of 1/1,000,000 and is based on a ground speed range of 105 to 225 mph. The

New XL-13 Grasshopper plane is the biggest of liaison types. All-metal craft carries overload of six.

plotter measures courses, determines distances and computes time-rate-distance problems.

At the 2nd Ferrying Group, ATC, Wilmington, Del., 1st Lt. Paul O. Dannenbaum has instituted a modification to the E-6B computer for use in determining drift by the radio pressure altimeter method. The improvement consists of a latitude scale which will enable the navigator to measure the cross wind component to the heading of his aircraft through an overcast, without the use of tables.

From the AAF Board at Orlando, Fla., comes news of a revision to log form 21A which incorporates the best features of suggestions emanating from the field. The "Observation" columns of the flight record have been moved to a central position close to the "Time" column, while other columns have been arranged to provide a logical sequence both in navigation procedure and use of the E-6B computer. A complete "Flight Plan" has been included, and one of the revised forms is normally sufficient for an 11-hour flight computed on the basis of observations recorded at 10-minute intervals. It is of a size suitable for use on all existing navigation tables and is further adaptable to any rigid backing that may be devised by the individual navigator.

WHAT'S WRONG with the picture on Page 53

1. The mech with the steam must be in a dream, or he wouldn't be clogging up the carburetor by directing the pressure hose at the exhaust stacks and air scoop.

2. With water and steam flowing freely around the plane, it's strictly taboo to leave doors and inspection plates open, as these men have done.

3. The man at the right is doing a good scrubbing job, but he's strictly out of bounds atop that wing.

4. The gun under the wing and the pitot tube should have their covers on to keep out dirt.

5. Never drape a hose over a movable control surface, as the man with the steam hose is doing.

6. Don't wash airplanes within less than fifty feet of the hangar. This Kingcobra is much too close.

7. Betcha didn't see the rag stuck in the oleo joint on the nose wheel! The man rubbing the plane's nose will undoubtedly forget to remove it.

8. The wing is off limits for that piece of cowling. Then too, the gas caps are open, and our wingman can easily spill water into the gasoline.

9. The small pressure boiler in the foreground uses an open-flame heater, and should not be so close to the airplane.

on the line

with mechs around the world

Up to V-J day two-hundred and fifty-thousand pounds of airplane parts were speeded to the Pacific daily from the 2nd Base Air Depot in England with the help of an electrically operated hoist constructed by T/Sgt. Emmett Pfluger of Eden, Texas. When the flow of shipping crates piled up faster than the loading crews could get them onto trucks, Sgt. Pfluger salvaged a B-17 landing gear retraction motor and attached it to a stationary overhead chain hoist by welding a sleeve over its axle and worm gear. An eletrical wiring cord from an inverter relay switch box to the motor transmits power to the hoist. Sgt. Pfluger is shown assembling another such hoist, which enables two men to load twice as much as was formerly possible with twice the number of men.

Pvt. William B. Dickerson, Indianapolis, Ind., operates the controls of a home-made sawmill in Burma which he and Cpl. William Brider, Eufaula, Okla., and Pfc. James B. Walton, Townley, Ala., constructed to ease the cut-lumber shortage at their 10th Air Force base. The radiator of the motor is a discarded airplane oil filter, while a jeep motor furnished the power.

During the critical Philippine Liberation campaign, 1st Lt. Maurice Kaufman, Malden, Mass., S/Sgt. Charles Chilvers, Chickasaw, Calif., and S/Sgt. Ernest Walters, Fort Worth, Texas, were confronted with the problem of devising some means for rapidly loading and unloading C-46 aircraft which were arriving at their 4th ASAC depot with inadequate machinery for this purpose. Successfully filling the bill, the men produced a 460-pound ramp consisting of two separate eight foot tracks to accommodate jeeps or light trucks on one side and bulk cargo on the other. For vehicle tracks, perforated landing strip was used, and for crates and boxes, rollers were improvised from water pipe. Ramp can be set up in 3 mins.

Taking a tip from "On the Line," men of the 'Flying Comanche' fighter group in China mounted a K-24 camera on the bomb shackles of a fighter plane, giving the job a streamlined effect by sawing off the stubs of a 75-gallon wing tank and affixing them to the ends of the camera. Lt. Jack M. Fulkerson, Sherman, Texas, and Cpl. Jerry L. Driggers, Sarasota, Fla., performed the installation. "It works perfectly," they say, displaying clear-cut prints of recent bombing and strafing attacks of their Mustang.

At a reclamation and repair squadron in southern Germany, Pfc. Yale E. Goodman, left, and S/Sgt. Guy K. Kline, install a supercharger with the aid of a special lift which the former constructed out of salvaged P-47 armor plate and miscellaneous parts. Firmly secured to the frame of the lift, the 200-pound supercharger is raised and lowered by means of a dual-cabled sling which straddles the fuselage and is suspended from the boom of a shop truck. Time and manpower is saved through the use of this apparatus.

RADAR BOMBING

(Continued from Page 13)

"area" bombing, and since so much of the bombing had to be done by radar, it became necessary for the AAF to revise its program of daylight precision bombing. The great incendiary raids, perfect for radar, began in March and continued unabated right through the rainy season. Pin-point missions were kept for times when it was fairly certain that bombing could be visual; for the rest, the 20th said it with radar.

Radar raids enabled us to do two things: first, to hit urban areas with sufficient accuracy to cause considerable damage, and, secondly, by sheer volume of effort (about 25 times that needed for visual bombing) to accomplish our bombing purpose where, without it, our planes would have been at the mercy of the weather. When the final score was tallied after V-J, blind bombing could certainly take a major share of the credit for the 581 industrial plants wiped out and the 44 cities almost completely razed.

Although even the most devoted radar enthusiast probably will not claim that radar bombing ever was as good as visual sighting, still toward the very end of the war it was undeniably getting plenty good—and there were pictures to prove it.

Ever since blind bombing first began, radar specialists, both civilian and military, have been hard at work in laboratories, at bases, and in combat itself trying to improve the equipment. By the time one set was built, they had at least two dozen ideas for something better. The "something better" was chiefly aimed at getting considerably higher resolution in the scope picture. One such type of new equipment was planned for the ETO, and crews were flying training missions preparatory to using it in combat when the European battle came to a close.

Simultaneously in the Pacific, B-29 crews of the 315th Bomb Group were trying the new equipment on for size. Its formal debut came in July when it was used on four raids against the Utsube River Oil Refinery, the Kudamatzo plant of the Nippon company and the Maruzen Oil Refinery in Shomotsu. Two radar bombing runs from 16,000 feet were officially credited with 95 percent destruction of the latter plant in what Maj. Gen. Curtis LeMay called the best radar bombing of his air units to date.

"Shows what radar can do when it's properly employed," said Col. Stuart P. Wright, former group commander and communications officer of the 20th Air Force, who has helped to pioneer practically every new radar bombing development since the early days of radar vs. the submarines.

In some quarters other veteran radar officers wondered if the new sets were really that good, or if Maruzen was partly luck. In any event, they were inclined to speak of it with a certain reserve lest air force commanders should demand that kind of show every time. Or perhaps they remembered what happened after the 8th Air Force raid on Wilhemshaven in November 1943.

BTO radar was still new in the ETO when that mission came up, so new in fact that the 8th had run but three previous blind missions—two over Emden on September 27 and October 2, using AAF "Pathfinder" planes with British BTO equipment, and a third on Duren on October 20 using British "Oboe" beacon-bombing. None of the three missions did much to strengthen air commanders' faith in radar, but they were still willing to be sold. Wilhemshaven sold—or oversold—them.

Using the first American "Mickey" sets entrusted to on-the-scene-trained radar operators of the 482nd (Pathfinder) Bomb Group at Alconbury, nine B-17 Pathfinders each leading 60 bombers set out for the important North Sea port. Eight visual missions had previously missed the target. The Pathfinders found it by radar, the formation bombed it through the overcast—and demolished it. It was a great day for the radar people and probably did more than any one thing to keep blind bombing on the winter's slate. But subsequent raids never quite matched it and before long skeptics were again mumbling, "Beginner's luck, that's all. Stuff's no good."

Nevertheless the raids, although leaving something to be desired, continued without let-up through the foulest European weather and gave Germany no bombing respite in which to repair her crippled factories. Toward the last, radar bombing was accounting for as many as four out of five bombs dropped.

The MAAF, meanwhile, was giving its own Mickey sets plenty of action. Using coordinated radar and visual bombing, and often assisted by P-38 weather scouts, its bombers levelled many of the Ploesti refineries as well as scores of industrial and military targets in the Balkans, along the Reich's southern front, and as far north as Schweinfurt.

If it made no other contribution in the Battle of Europe, BTO radar paid for itself many times over on D-day when, entirely by radar and through weather that would otherwise have made it impossible, more than a thousand AAF heavies knocked out with pin-point accuracy gun emplacements along the Normandy coast exactly 10 minutes before Allied troops, waiting in landing craft less than 1,000 yards away, stormed ashore.

Assessing radar's role in the AAF and emphasizing its military future, General Carl A. Spaatz has this to say: "So far as the work of the air forces was concerned, the job could hardly have been done without the various radar devices with which we were provided.

"Even so, it was sometimes necessary to classify our employment of radar with the talking dog, which commanded respect not because it talked so well but because it talked at all. Our radar bombing wasn't at all first rate. But radar bombing techniques are still new techniques, undergoing changes and refinements almost daily. . . .

"More and more of radar's tremendous potentialities are coming up for realization as new equipment and new procedures come forth to solve old problems. But all of them put new and continuing demands on operational know-how—and the imagination which gets the most out of that know-how." ☆

THIS IS YOUR ENEMY

(Continued from Page 15)

described abject defeat) announced that "psychologically speaking, the Japanese are still the leaders of Greater East Asia." *Asahi* was more definite, declaring that the ideal of racial emancipation still gripped the minds of all those Asiatics who had cooperated in the war against the Allies. Years, perhaps decades, dividing the present from this ultimate racial goal might be put to good use. "A worthy race, capable of survival, makes any trial the occasion to set out for new destiny."

Yoshi Muto of the Japanese Broadcasting Corp. addressed the Japanese abroad in the same terms: "We have worried His Majesty to no small extent. But we are now given the chance to test the true power of our race."

Japanese airmen got two final handouts on that historic weekend when the Emperor's representatives transferred from the white planes to the Air Transport Command's C-54 on Ie Shima.

The first, hard-hitting and forthright, was Kusuo Oya's summary of the war. "We did not lose because we were wrong or our thoughts erroneous," he reminded them. "We lost because we lacked material strength. I believe we have not lost to the enemy. . . . We have lost in the battle of the strength of material weapons and in economic power, and we have submitted to so-called unconditional surrender. If we had lost in the spiritual and ideological way also, then there would be no future for the Japanese race. The life of our race is eternal, and I should like to believe that the life of our national policy is eternal also."

The second handout was the valedictory of the founder of the Kamikaze program. Before taking his own life, Vice Admiral Takijiro Onishi addressed himself to the future.

He hoped that young men everywhere would be convinced that "ill-advised conduct invites disastrous consequences." Furthermore, he admonished, such youths as the Japanese airmen should now "attend to peacetime circumstances, maintaining steadfastly the spirit of the Special Attack Corps, doing your utmost to revive Japanese race and world peace."

"Nuts!" the Japanese GI might have said. What two Japanese prisoners of war actually did say somehow makes more sense than Radio Tokyo's blather, the curving syllables of Domei and the interminable word-strings of the orators.

One tired Japanese soldier wrote the war off, "I have surrendered to the joy of just being alive. I hear about men who say they do not wish to return to Japan because they have been captured. Unnecessary obstinacy, I think. Of course, there'll be no flourish about my going back. I'll get home quietly, without any show."

To which a POW companion added, "Home is the place of happiness. You might say that as long as a man is able to go home in safety, he will never know sorrow." ☆

BELOW THE MAST

(Continued from Page 21)

of the vessel at a vulnerable spot. Escape from target was aided by top speed, the low level of attack and evasive action. Low-level flying also proved to be a protection against enemy fighters and a great aid to target identification, especially in avoiding dummy targets.

The strikes out of Okinawa against shipping in Tsushima Strait were attack bombing in its most refined form. The designated groups were alerted, normally four squadrons of six aircraft each. The planes were armed with four 500-pound bombs. Missions were made in two waves of 12 planes each, the first wave taking off 15 to 20 minutes in advance to locate the convoy, providing the second group a saving in gas consumption and a potential increase in time over the target.

The pattern of actual attack runs somewhat as follows: the first wave's initial attack is designed primarily to stop the convoy and neutralize ack-ack. The second wave, guided to target by radio from the first wave, plans its arrival over target just as the first group has completed its attack.

In the attack itself the leader takes stock of the convoy and commits his formation to immediate attack to achieve maximum surprise. He tries to place as many planes as possible over target to the width of the convoy, usually makes the first pass —stern to bow against warships, broadside against merchantmen. The sweep is made at great airspeed, mast high, guns raking the deck. Two bombs usually are released on the first pass. Now the vessels are dispersed and damaged, easier prey to a methodical follow-up attack on single ships.

For the follow-up, the formation normally is split into flights of two aircraft, sometimes single planes.

Attack aviation in the Pacific, a breeder of leadership and discipline, has given rise to a number of outstanding commanders, among them such men as Majors Ralph Cheli and Raymond Wilkins—both Medal of Honor winners—Colonels Jock Hennerbrey, Dick Ellis, Donald Hall, Clint True and Shanty O'Neil.

The attack units are specialists, just as a surgeon is a specialist. Their department happens to be on-the-deck surgery. Unlike a good doctor, they try their best to lose every patient. ☆

Answers to "How Sharp Are You"

Photo on Page 2

Questions on Page 43

1. Propped against landing wheel
2. 18
3. True
4. B-24
5. Three
6. True
7. One
8. Four
9. False
10. False

Roving Paymaster

Pacific atoll pay-off is their main job, doing odd chores back in civilization for island-isolated individuals a sideline

BY S/SGT. JAMES WINCHESTER
Hq, Air Transport Command

Carrying a cool hundred grand in cash, a pair of ATC finance men pack off from Hickam Field once a month to meet the payroll on tiny Canton, Christmas and Johnston Islands in the Pacific.

One month it will be Capt. Alfred Viescas and S/Sgt. Lelon R. Eager, Jr., the next month Capt. James E. Thomas and S/Sgt. James R. Angio. It is a junket of 17 to 20 days, 7,500 miles of riding bucket seats, sleeping on the floors of C-47s, eating at odd hours or not at all.

There isn't much to use money for at a barren spot like Canton or Christmas or Johnston. But Army regulations say soldiers must be paid and, where possible, on time. Since the Army stations on these outposts are too small to have finance offices of their own, a traveling finance officer from ATC's Pacific Division must drop in once a month to walk the ghost around.

There is something like magic in the way the word spreads when the pay plane arrives. The line forms before the finance men can get set. Getting set consists of spreading an Army blanket over a table or box and getting out the money and records. Then the boys file past, drawing the stuff as eagerly as if there were places to spend it.

And there are. Within 10 minutes after the payline forms, a poker game—or two or several — is in progress around the island.

"By the time we get ready to leave the island two or three days later there is often one big winner coming around to us with his winnings for us to put into war bonds or savings for him," says Sergeant Angio. "Hardly ever is it the same guy twice in a row."

As the only regular link between the men on these islands and the civilization of Honolulu, the finance men return from each trip with lists of things to do for guys on the islands—messages to deliver, errands to run, calls to make. Sergeant Eager says it always takes him three days to a week to get his personal favor list cleaned up after one of these trips, and Captain Viescas, by way of saying amen, produced his list from the preceding trip. The items included picking up a set of dog tags for a soldier on Christmas Island, delivering personal messages to 11 people in Honolulu, picking up a camera for a corporal on Canton, getting the laundry of a Canton lieutenant who had shipped out unexpectedly, paying off a note at a Honolulu bank for a sergeant on Johnston, wiring flowers to several girl friends and wives in the States, having five pairs of glasses and three fountain pens repaired.

Nor are all the extra-curricular duties unofficial. The finance officers serve as postal inspectors, checking up on the postal facilities at each of the islands they visit. And not quite so officially, they are, in the words of Viescas, "couriers, chaplains' assistants and sewer inspectors."

As its operations have spread around the world, the ATC has had to face money problems of many kinds. It is ATC policy to pay troops and native labor in the currency of the country in which they are stationed, and there are nearly 100 ATC bases scattered over the world's crossroads. This has necessitated setting up a worldwide banking and foreign exchange system dealing in the currencies of 36 countries. Finance officers have been recruited from foreign exchange departments of the largest U. S. banks.

A travel-weary pilot who is rather a whiz at gin rummy recently presented himself to his finance officer with a collection including Canadian dollars, British pounds, Portuguese escudos, two kinds of French francs, Egyptian piastres, Iranian rials, Indian rupees and Chinese dollars. He exchanged the assortment for a wad of American greenbacks. ☆

Berlin Post Mortem

Carrying wood home in a go-cart, these Berliners pass what remains of building which housed Goebbels' Propaganda Ministry.

BY CAPT. TOM SILER

AIR FORCE *Overseas Staff*

Berlin is the most bombed city of the European war by an overwhelming margin. On a percentage basis, the city is not as beaten up as Hamburg, Cologne or Frankfurt simply because of its immense area. Many factories were untouched by bombs, thousands of dwellings are intact, but the factories producing priority materials—aero engines, guns and bullets, locomotives, electrical supplies, oil refinery equipment, tanks and shells—were plastered repeatedly.

The strategic air war on Berlin was a model of cooperation and coordination between the RAF and USSTAF. Add to this a few air attacks by the Russians and one spectacular bombing by the Italy-based 15th Air Force. These combined forces rained well over 75,000 tons on Berlin, finally breaking the morale of a people thoroughly regimented and helpless in the iron grip of the Nazi war machine.

By late 1943, the RAF was sending over great fleets. On March 4, 1944, the 8th Air Force jumped into the battle, gradually growing stronger until as many as 1,300 Forts and Liberators bombed Berlin in a single daylight attack. Three months later, RAF Mosquitoes began their relentless surprise raids, at one time visiting the city 36 nights in succession. Once into the Berlin air battle, the 8th used 8,718 bombers to drop 21,788 tons of bombs, sending along 11,563 fighters as escort in the 19 missions to the city. Over Berlin alone the 8th destroyed 855 Nazi planes, with a loss of 282 bombers and 180 fighters.

This massive effort against Berlin was not the work of vengeance. Air attacks were not retaliation for the bombing of London. There was only one major factor involved: Berlin was the greatest single target of strategic importance in the Reich. It was the capital of Germany, headquarters of the government and the party, but far more important, its industrial output was much larger than that of any other city. It contained one-tenth of all the high priority factories. Its population was 4,400,000. Two-thirds of its working population was engaged in war production. Factories destroyed or severely damaged run into the thousands. Add to this the piles of dust and rubbish that once were the striking cluster of buildings which housed the Chancellery, Air Ministry, Propaganda Ministry, Gestapo Headquarters and others and you have irrefutable evidence of how strategic bombing of Berlin shortened the war.

The Berliner Zeitung recently estimated that Berlin would have to cart away more than 50,000,000 cubic meters of trash and rubble before it could even start to rebuild. The news account said that in the city proper 800,000 buildings were either destroyed or badly damaged and that 10,000,000 trucks or 3,000,000 railway cars would be needed to carry off the crushed pillars, shattered houses and buildings, twisted girders and burned out buildings. ☆

800,000 buildings destroyed or badly damaged—that is the picture today in the most heavily bombed city in the European theater

The Reich's transport and railroad stations were wrecked by the continuous raids of the AAF and RAF. At one time 448 trains left Berlin daily; by the end of March the number was 39. Over 50,000 workers were busy constantly restoring even partial service.

Germany's highly centralized government was a target as well as the industries concentrated in the city. Above are ruins of Hitler's chancellery with its famous balcony barricaded. Other buildings of the Nazi administration got even worse treatment from our bombers.

The Intercom

As a medium for the exchange of ideas, AIR FORCE presents these answers to its Question of the Month. Replies are those of personnel recently returned from combat duty in the areas indicated.

QUESTION: What type of personal plane would you like to own after the war?

Capt. John Godfrey, pilot, 8th Air Force: "I want a small single-seater plane that would be easy for acrobatics. I don't get any fun out of flying straight and level—anybody can do that. I want a plane I can really push around. A 400-mile range is enough because there will be plenty of airfields and you won't have any trouble finding a place to refuel. Between 175 and 185 mph would be enough speed and $3,000 ought to pay for it. I'll never get tired of flying and if I had the money that is the kind of an airplane I would buy. Just keep it without any doodads."

Cpl. Milton J. Wynne, special service, 15th Air Force: "I'm an artist, and I want a personal plane to take me to places where I can find good subject material for my drawings. It should be small and speedy, and a kind of a plane that will take off and land on postage stamp fields. I want to draw Americana, and my plane will have to move in and out of the back country and out of the way places. And I want an automatic pilot arrangement so that I can sit back and draw even while I am flying. I've heard of flying doctors and flying salesmen and I want to be a flying artist."

1st Lt. Donald Smith, pilot, 13th Air Force: "I want a single-engine job. I have flown twin-engine planes for so long now that I'm tired of them. And the plane would have to be capable of high speeds—I'd consider about 200 mph a fair speed for my purposes. There should be room for three passengers but only one set of controls—I don't want any back seat driving. And it should have at least a 1,000-mile range so I could make long non-stop flights. I don't want to be going up and coming down all the time. I would use it for both business and fun, like an automobile."

1st Lt. Joseph Becker, antiaircraft, 10th Air Force: "Give me a five-passenger plane. If your plane is too small, you can't carry anyone and if it's too big, the gasoline and upkeep charges will be too expensive. A five-passenger plane is a happy medium. I want only one engine. It certainly is just as safe and the repair costs would be much less. I think there should be some oxygen sets in the plane so I could get pretty high. I really want to do some flying. My guess right now is that about $8,000 should cover the cost once the aircraft plants start producing them on a production line."

Sgt. Eugene Pitts, ground crew, 15th Air Force: "I would like a two-passenger plane for economy and ease of operations. Eighty-miles-an-hour cruising speed is fast enough for me. There is no need to go any faster in a private plane. The whole idea is to take it easy and see the country. I like the security of a twin-engine job; if anything goes wrong with one engine, you still have a chance. I think that $1,000 would be a fair price for such a plane, and maybe a little cheaper. The small plane is going to replace the automobile and there won't be any stop lights."

1st Lt. Joseph Briccola, pilot, 13th Air Force: "I want two personal planes. One for speed, to see the country, and one for pleasure. For a fast plane, I think I'd like a jet job if they are on the market. And for just flying around, I would buy an AT-6 from the government. Then I would hire a ground crewman from the AAF to soup up the engine so that I could cruise at about 225 mph. With a powerful engine, the AT-6 will be plenty of airplane for me. I learned to fly with that plane and I'd like to use it after the war. And I'll bet I could get one without paying too much for it."

LONG LEGS

(Continued from Page 18)

at the very end of the strip, Young took the signal, gunned his engines and started down the runway. He was airborne at the very end of the strip. The other 39 got off safely.

It was a long ride. Several planes experienced engine trouble, some turned back because the pilots knew they wouldn't have enough gas; other pilots bailed out and were picked up by Navy rescue Cats.

But 24 reached the target, one formation in three hours and 30 minutes, another in three hours and 55 minutes, the third in four hours and 20 minutes. Jap fighters, expecting unescorted bombers, evidently were thrown into confusion by the presence of the fighters. Seemingly without a defensive plan, the enemy attacked singly and without coordination. Eighteen Jap fighters were shot down, with the loss of one of our own, and the B-24s were able to carry out their mission with a minimum of interference. From takeoff to landing back at Morotai, some of the planes were in the air eight and a half hours.

Four days later the fighters went back, this time about twice as many. Some of the pilots who had flown the first mission flew again. This time they bagged 35 enemy planes, with five probables. We lost five fighters, only one by enemy action. The others came down in the water and the pilots were rescued.

After that the Japs relied on antiaircraft guns to defend Balikpapan, seldom sending up any interceptors. The bombers were no longer troubled by Jap fighters.

On October 14, six 13th Air Force P-38s, led by Lt. Col. Leonard Shapiro, reached out even farther. The target was still Balikpapan but this time the fighters were flying from the Middleburg base. Using 165-gallon belly tanks, they flew a round trip of 1,900 miles, and broke up a Jap formation, shooting down two and damaging two others.

Fighter missions of seven, eight, even nine hours were becoming SOP. They ranged in all directions, striking from the southern Celebes to the central Philippines. Support was given various Philippine landings. Thousands of tons of shipping were sunk by the long range fighters. In February, 1945, they struck at the coast of China, spreading destruction from Hongkong to Amoy.

In June, 1945, on a search mission out of Morotai, 15 P-38s were in the air up to 11½ hours. And by July Lightnings of the 13th's Sunbusters Group flew nearly 2,100 miles on a mission over Singapore.

It was a long trail from Moresby to Okinawa, and the fighters helped blaze every foot of the way. Europe had its fighter problems, and they were solved. The vast overwater distances of the Pacific presented peculiar problems, and they too were solved.

After his capture, in Europe, Goering exclaimed that American long range fighters were the biggest surprise of the war.

On the other side of the world, Jap warlords could sigh and say, "Ain't it the honorable truth?" ☆

RENDEZVOUS

(Continued from Page 36)

two combat missions of 18 hours, 10 minutes, and 17 hours, 40 minutes respectively. B-24s, equipped for long range antisubmarine operations, were utilized. Purpose was to give all-night coverage to the "Empress of Scotland," which traveled without surface escort. . . .

It might be of interest to note that the airborne radar equipment on the two aircraft functioned successfully and continuously for 15 and 14 hours on these missions.

W/O E. G. Keener,
Langley Field, Va.

Dear Editor:

In reading your ever popular AIR FORCE, we came across a particularly interesting article in the February issue, entitled "Fighting 13th." Among the many targets bombed by the 13th, Balikpapan seemed to be stressed. We know the 13th is doing grand work and deserve great credit, but we believe something is being left out.

According to a 5th Air Force bulletin, the 380th Bomb Group, better known as the "Flying Circus," was credited with not only the longest mission until the coming of the B-29 to this theater, but the first over Balikpapan.

An August 14, 1943, the 380th pulled a surprise raid over this target, bagging approximately 40,000 tons of shipping without the loss of an aircraft. The journey covered 2,620 miles round trip and our planes were in the air from 1645 to 1715 hours. The same conditions were experienced as were with the 13th, but with much less preparations.

How about giving the Flying Circus its due?

Four Originals of the Flying Circus,
APO 321.

Refund

Dear Editor:

As a faithful follower of AIR FORCE and a firm believer in the thought that it takes skill to create and lack of understanding to find error, I have been somewhat hesitant about writing this note. However, as an attorney and legal officer, I know that you would want me to call this one item to your attention.

In the August 1945 issue, the feature, "Questions on Policy and Procedure," contained a query regarding the assessment of money penalties for minor derelictions without action by court-martial or under Article of War 104. Although the answer correctly stated that a court-martial or action under Article of War 104 is necessary, the Article of War 104 aspect was not fully explained, resulting in an erroneous sketch showing a brigadier general taking half the pay of a private first class. The fines under Article of War 104 may only be imposed upon company grade officers and not upon enlisted personnel. Therefore, your Art Department will have to arrange for the general to give back to the private first class his pay forfeiture.

In closing, I would like to add that I have found the AIR FORCE to be a great aid in its publicizing of various matters that have arisen regarding policy and procedure.

Capt. Herbert Bialosky,
Pyote, (Texas) Army Air Field.

The PFC is herewith reimbursed.—Ed.

Sound Practice

Dear Editor:

One of our major problems while operating from recently bombed and recaptured airdromes during the late fall and early winter was mud and refilled holes.

Taxiing over this kind of terrain not only caused us severe tire, brake, and excessive engine run-up maintenance but cost the life of one pilot and caused a serious handicap to the copilot.

The pilot of the C-47 was taxiing normally, when the left wheel of his plane became stuck. Attempting to dislodge it, he applied full left throttle. This succeeded in pulling the plane over its first obstacle but . . . instead of rolling, the wheel buried itself in another hole which was recently refilled and still soft. This caused the prop to strike the ground (at approximately 2,500 rpm) breaking the prop hub and throwing one of the blades through the cockpit, killing the pilot, maiming the copilot and destroying the cockpit beyond repair.

We have found that a policy of cutting the throttles *immediately* upon being stuck and awaiting the "cleat track" is a very profitable one, even though it might seem inconvenient at the moment.

1st Lt. Arthur C. Kane,
APO 744, N. Y.

The office of Flying Safety says Lt. Kane's idea is sound and should be practiced by all pilots. A few minutes' delay is sounder behavior than attempting risky action to get out of a potentially dangerous situation. By all means, wait for the "cleat track."—Ed.

Wrongside Up

Dear Editor:

On Page 16, June issue of AIR FORCE, there is a sketch illustrating proper bail out procedure from a German fighter. The written instructions below the sketch say to push the control column forward to make the plane nose down. Shouldn't your sketch be flying right side up to do this?

Pvt. Rollin Sturgeon,
Squadron H, Lincoln AAF, Neb.

Right. Our artist was in a tailspin.—Ed.

PICTURE CREDITS

FRONT COVER: T/Sgt. Roger Coster, AIR FORCE staff photographer. 25: Consolidated-Vultee Aircraft. 44-45: Sgt. Norman L. Pratt. 58-59: S/Sgt. Ben Rosenblatt. All other illustrations secured through official Army Air Forces and Signal Corps sources.

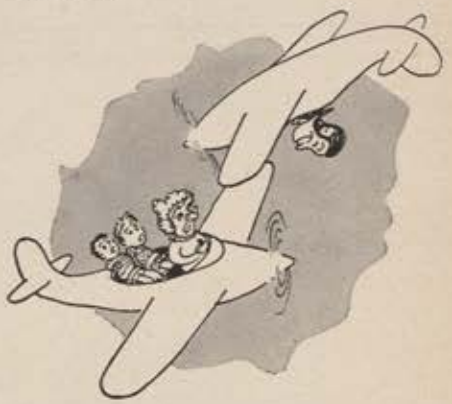
FLYING FOR FUN

(Continued from Page 27)

powered aircraft, accumulated after receiving the rating as a glider pilot

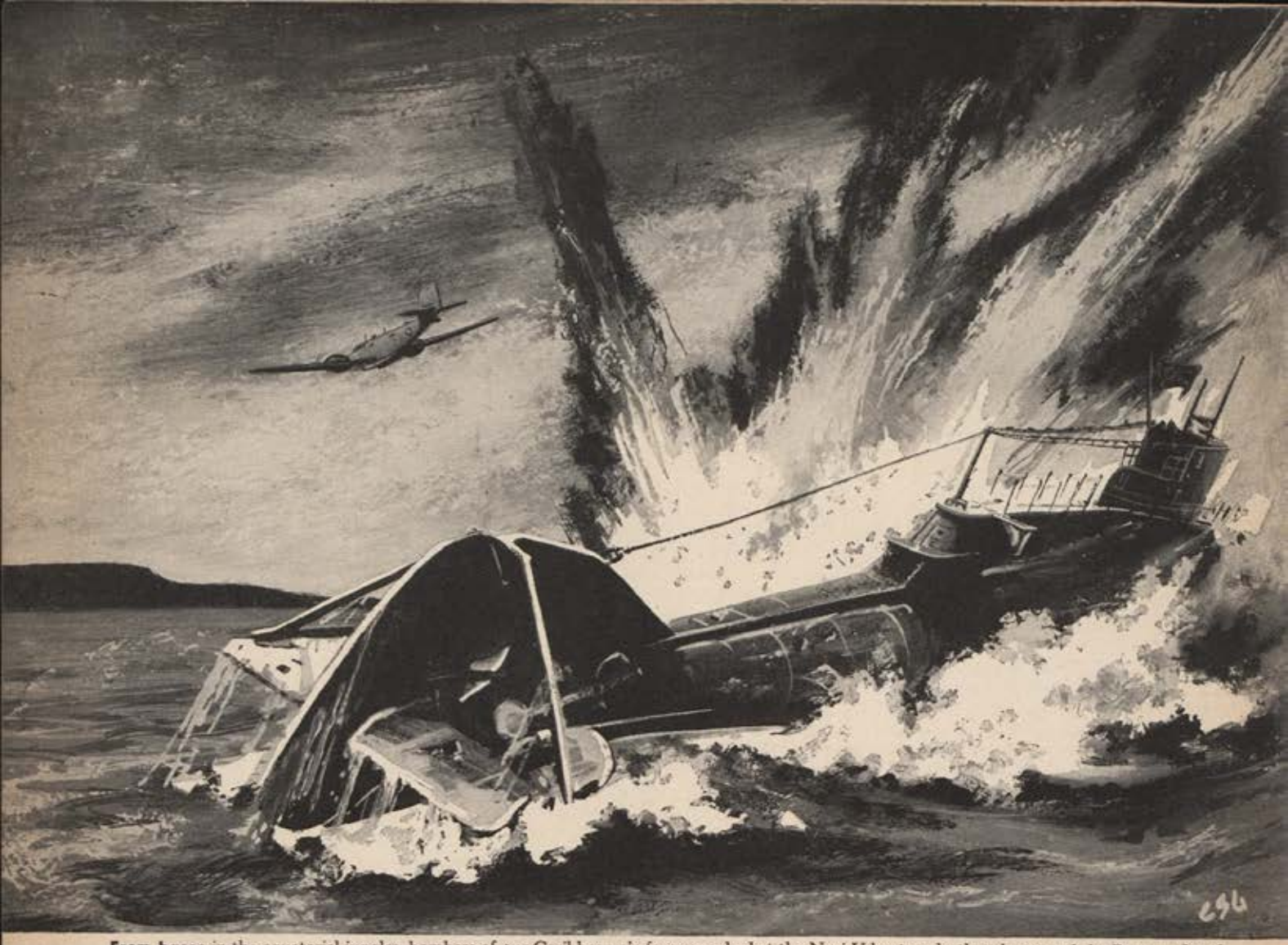
Otherwise, it is necessary for liaison and glider pilots to obtain additional time until 200 hours are accumulated. Then a written examination and a flight test are required.

A word of caution. Before most CAA officials go to bed at night they earnestly pray that no hot-shot pilots will apply for a license. If you have an insatiable desire to fly under a bridge, it is hoped that you will go build a bridge on a desert and fly under it to your heart's content. But don't pick on any bridge that has been erected in the past 10,000 years. And if you don't like the mayor of your town and want to buzz the City Hall, you'd better make up your mind it may be your last flight. If it is proved that you have endangered life or property, your certificate will be suspended. There will be considerable air traffic in the postwar world and when Grandma is flying the kids down to the ice cream emporium, she may not be able to get out of the way of a cantankerous cowboy in an airplane. And there is no reason why she should have to. ☆



Answers to Quiz on Page 46

1. (C) Boom tail design
2. (D) White Face Mountain, Vt.
3. (A) Railway tracks
4. (C) Dual intermeshing rotors
5. (D) 0 to 10,000 feet
6. (B) One mile long and ¼ mile wide
7. (C) Warning set
8. (B) 1907
9. (C) Instrument for measuring power
10. (A) Port of Aerial Embarkation
11. (D) Sedative for personnel
12. (B) Process for color-printing photographs
13. (B) Term used in aerial photography
14. (B) May 14—August 17, 1943
15. (B) False
16. (A) 3,000 miles
17. (A) True
18. (D) Converted Liberty ships
19. (A) B-24 with a single rudder
20. P-80



From bases in the equatorial jungles, bombers of our Caribbean air force smashed at the Nazi U-boat packs that threatened the Panama Canal.

6th AIR FORCE

BY CAPT. JOSEPH D. GUESS

AIR FORCE *Overseas Staff*

Many of the men who wear a galleon above the wings on their shoulder patches to represent the 6th Air Force may sometimes feel that they have fought a forgotten war. Yet they belong to the oldest of all our overseas air forces and, since more than a year before Pearl Harbor, their air force has been on 24-hour alert in some of the hottest, most rugged terrain in the world.

While no enemy fighter plane has ever appeared in their sights, flyers of the 6th have seen their guns grow warm. The subs got so bold back in 1942 and 1943 that they stopped submerging when flushed and began fighting it out with the water-skimming patrol bombers. The subs had what it takes to fight with—plenty of heavy caliber machine guns and 20-mm and larger cannon. The 6th has a sobering record of missing aircraft.

You can glance at operational reports and see such entries as these: "B-18C sights surfaced sub which fires AA and MG. Plane drops five depth charges, sub submerges," or, "Eleven aircraft fired on by subs . . . ," or "Enemy sub fires on aircraft circling to bomb; aircraft damaged, forced to retire." The report could go on. But enough subs, in turn, were sunk or damaged to get rid of them long ago.

The 6th, however, continued on guard with utmost vigilance. Everyone realized that the Panama Canal—protection of which was the primary job—had been one of the Western Hemisphere's most strategic assets. And when the entire combat job had shifted to the Pacific, it became more vital than ever. The enemy realized what he could accomplish by sneaking a few planes into the canal area. So the 6th, under the command of Maj. Gen. William O. Butler, settled down to the monotonous job of securing the skies over the water and jungles.

The 6th also undertook additional tasks which were important in the prosecution of the war in other theaters.

In July of last year, when the sub danger was well in hand, Brig. Gen. Edgar P. Sorenson, then the Commanding General of the 6th, suggested to Headquarters, AAF, that the Canal Zone would be ideal for absorbing combat training crews into existing tactical units for on-the-job training —especially if the crews were destined for theaters which had extremely unpredictable weather and jungle hazards.

Some of the B-24 and P-38 bases were literally hacked

Snakes and submarines have been the chief foes of this little-known Air Force to the south

A man could die in sight of his base.

out of the jungle. Surrounding on every side are mangroves and other vegetation so thick a person can't budge his way through. There have been cases when flyers have had engine failure or other trouble, parachuted (forced landings are usually out of the question) in sight of a base, and yet died before rescue parties could hack through.

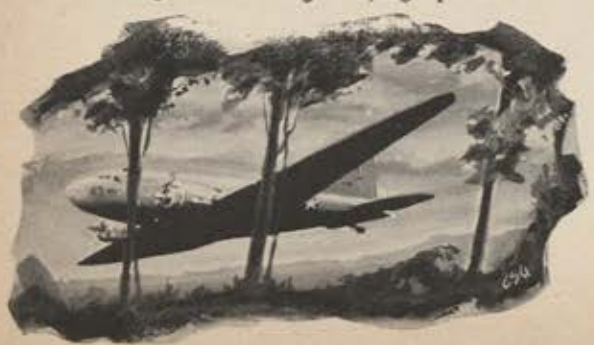
The jungles in Panama and some other Central and South American countries within the 6th's current zone of operations, are not very pretty places. True, you might see some of the world's rarest birds, many-hued and brilliant in color, and interesting types of not too vicious monkeys. But a man stranded here would be more concerned with the over-abundant supply of poisonous snakes, such as the bushmaster, from four to eleven feet long, aggressive, deadly poisonous; or the fer-de-lance, from three to eight feet, highly poisonous; or the boa constrictor, perhaps fifteen feet long, which isn't poisonous but is capable of squeezing a man to death. There are scores of snake types, all more or less aggressive and poisonous, and extra large alligators.

Needless to say, a man has to be pretty well equipped and trained to have a chance in such a country. Not that the 6th Air Force men are forced to take daily strolls through such places. But they do fly above these jungles and encounter sudden rain-squalls, thunderheads and fronts which invalidate all forms of navigation and may cause most anything to happen. So upon arriving in a jungle squadron, a new man, whether a trainee or a new member of the permanent party, gets some specialized instruction. He puts on chemically treated clothing, high boots, gloves and headnets, swabs his face and hands with ointments, is shown how to wield a machete or jungle knife against animal or snake, and is conducted on overnight jungle hikes. Ground personnel also get some of this training.

Before the war with Japan ended, about one-fourth of each fighter and bomber squadron were trainees, who would fly on to combat areas after getting the equivalent of the three-month, three-phase training schedule of commands in the States.

In the matter of training, the 6th is greatly responsible for sponsoring air-mindedness in Central and South American countries. From the Air Force School of the Military Training Center of the Panama Canal Department there have been graduated men for the air forces of Peru, Colombia, Venezuela, Ecuador, Chile, Brazil, Nicaragua, El Salvador, Costa Rica and Guatemala. Nearly every month sees at least a small group of flyers and ground men from our neighbor countries get their wings or certificates. Officers and enlisted men are trained in armament, communications, navigation, gunnery and combat flying. The First Brazilian Fighter Squadron, which made a fine record in Italy, was trained here.

Navigation was tough on jungle patrols.



Particularly an agency of good will in this air force is the 20th Troop Carrier Squadron, which, besides having a hand in teaching flyers of neighbor countries, has a dozen other jobs. Rather than transporting troops, it is primarily a freight-carrying and mercy mission outfit. Hardly a week goes by without a civilian from one of the nearby countries or an air force or other Army man depending on the 20th to save his life. If someone at an isolated village or airbase has acute appendicitis or gets bitten by a coral snake or mauled by a jaguar, a pilot of the 20th likely has to climb out of bed in the middle of night to do an emergency evacuation—and he might have to land his plane on anything from a strip of beach to a wide space in the jungles.

This one workhorse squadron also figures big in the 6th Air Force because it flies mail and supplies and shuttles personnel back and forth between more than a score of jungle bases. It makes travel easy and quick where there are no highways or railroads. It also has set up an international airlines to supply and provide transportation for U. S. Army air missions in nearly every South American country. To do this, it is now flying regularly, with sadly inaccurate maps and only a few radio aids, over many thousands of miles to some of the world's most treacherous areas—the Andes Mountains and the Amazon Valley. Some of the 20th's veteran pilots have each completed more than 2,500 hours' flying time during their tours. And the squadron has had its own submarine troubles. The Germans used to surface, ride the same radio beams the squadron used, and fire on any low-flying transports.

One advantage enjoyed by flying personnel of the 6th is the occasional chance to land in Costa Rica, Guatemala, Peru or some area with a pleasant climate. But there are ground personnel—cooks, mechanics, clerks and others—in the isolated little bases who have been jungle-bound for two or three years. Men often remark, "Until you have been here two years, you are a new man."

But not long ago a new policy called for rotation of combat training crews to the United States after 12 months and permanent party personnel after 24 months, and Japan's surrender was expected to cause further changes.

Compared to what they were at the beginning, the 6th's jungle bases are now nicely livable, if you think in terms only of eating and sleeping and working. Food is good; there always seems to be cattle country close enough to supply plenty of choice steaks. Beer, liquor and rum are generally adequate. During the dry seasons, the screened and windowless barracks catch plenty of breeze at nights. There is likely a beer garden and an officer's club and a movie on the base. And, probably, a few miles down a scraggly little road, a tiny village and one fly-filled bar.

These bases are small. But taken all together they form a powerful fighter and bomber defense of the canal. They fit into a highly co-ordinated and maneuver-tested plan of dispersal and air control. The Panama Canal, from the standpoint of both air and ground weapons, is one of the world's most strongly defended areas, and you have only to fly over the area with its airbases to realize what reliance is placed upon airpower in guarding this military prize. ☆

SHOOTING THE BREEZE

Got any good stories? Send 'em in!

China. Most Chinese pilots are much smaller than the average American airman, and this difference in physical stature gave rise to a unique assignment of "ratings" among these pilots in the Chinese-American Composite Wing. The Chinese flyers used cushions to assist them in reaching the rudder pedals of their aircraft, with a natural result that some billiard fan soon began gauging them as one-, two- or three-cushion pilots. In combat, however, size proved unimportant when a three-cushion man was credited with three and a half Jap planes in a single air engagement.

USA. An obviously disturbed old lady rustled into military police headquarters in a western city recently to complain about what she described as "the disgraceful conduct" on the part of a group of Army chaplains she had observed going into a house near the downtown district on successive Saturday nights.

"I could see dancing and drinking going on inside," she exclaimed, "and I don't believe that's any way for chaplains to act. I think you ought to do something about it."

The MPs promised the visitor they would look into the matter, and on the following Monday the old lady was back again to learn of the results.

"I'm sorry, lady," the desk sergeant said. "We went around to the address Saturday night and we couldn't find a chaplain anywhere in the neighborhood."

"Why you must be mistaken," she exclaimed. "I went back there myself and I saw dozens of them going in that house. I know because they all had those little churches on their collars."

"That house" had been the Engineers Club.

Pentagon. It was one of those high-level, policy-making "long-hair" offices. During the war three of the officers in it had to get the prescriptions for their glasses changed, and others occasionally went TDing overseas with brief cases strapped to their wrists. Came V-J and, although their point scores were low, most of the officers were of sufficiently mellow years to be granted relief from active duty.

One day their commanding officer called them in for one of those Pentagon conferences. The CO was very pleasant; he knew exactly how the men felt now that the war was over. And despite the fact that there was still a lot of advising and planning to be done, he would not stand in the way of an eligible officer's relief from duty—provided each man on leaving would have found a replacement of "suitable qualifications and of equal talent and ability."

Apparently their last assignment had been their only impossible one in the Army. Weeks later, all the officers were still in uniform.

Kyushu. Taking time out from their job of helping reinforce fortifications along a spot of sacred coastline which Jap intelligence figured was a likely landing spot for American invasion forces, two Nip soldiers hunched over their rations of rice and fish heads.

Between crunches, one soldier turned to the other and inquired cautiously, "Have you heard about the atomic bomb?"

"Yes," his companion whispered. "When are we going to use it?"

Burma. Some time before the liberation of Allied prisoners of war in a lockup near Rangoon, a B-29 tail gunner captured after a bailout was being grilled rather harshly by a Jap interrogation officer. The questioner stalked the floor in front of his bound prisoner, obviously attempting to think of a query that would open the mouth of his stubborn victim. Suddenly he wheeled and inquired, "What do you think of the B-29?"

After a moment's hesitation, the sergeant replied cockily, "I think it's a damned fine airplane."

The Jap officer looked furtively behind him, leaned across the table and whispered: "So do I."

ETO. It's not often that we become concerned with the activities of civilians, but war correspondent photographers—well, you just can't help paying some attention to them.

Shortly before the end of the war in Europe, a news photographer, with a solid reputation around the world, was having his difficulties out on the line with a public relations captain lately from headquarters and quite nervous. Every time the photographer wanted a picture, or a jeep, or a case of 10-in-1 rations, the captain would refuse the request.

Finally, the photographer, a big-bearded fellow and very impressive, started poking a finger in the captain's chest. "I want you to know something," the cameraman said. "Some people have allowed that maybe I'm the best combat photographer in the world. I might be and I might not be, but I've never heard anyone say that you're the best captain in the world."

Manila. One of the Jap emissaries in town for the initial surrender negotiations stopped by a PX to buy some American cigarettes. The GI back of the counter was surprised when the Jap handed him a 10-dollar U. S. bill—but not nearly so much as the Jap when the clerk returned the change in Jap yen. ☆

The Album DISTANCE FLIGHTS

Orville Wright flew this from Ft. Myer to Alexandria, Va., a good five miles, in 1909. Time beat two horses, one Reo.

These pioneers, Lts. J. A. Macready and Oakley G. Kelly, made the first non-stop, California-New York flight in 1922.

Round the world in 176 days in 1924 got these men Collier Trophy, DSMs, claustrophobia. Left to right, Sgts. Turner, Ogden; Lts. Arnold, Wade, Smith; Maj. Martin, Sgt. Harvey.

Lt. R. L. Maughan flew this Curtiss PW8-D12 Curtiss 450 from New York to San Francisco in 1924. Elapsed time was 21:48:30; the flight was enthusiastically called "daylight."

A lot of present-day rank was in this flight from Bolling Field to Fairbanks, Alaska, in 1934. Kneeling: Capts. John D. Corkille, Harold M. McClelland, Ray A. Dunn, Westside T. Larson; Lts. Ralph A. Snavely, Nathan S. Twining, John S. Mills, Hez McClellan. Standing: Lts. Lawrence J. Carr, Charles B. Howard; Majs. Malcolm C. Grow, Hugh J. Knerr; Lt. Col. H. H. Arnold; Maj. Ralph Royce; Lts. John S. Griffith, Leonard F. Harman. Colonel Arnold was awarded the Mackay Trophy for commanding flight.

the BATTLE against ANOXIA isn't over!

Anoxia is an ever-present danger in flight. Combat this enemy by being alert, by using your oxygen

- at 10,000 feet and above on all flights
- from the ground up on all tactical flights at night
- and between 8,000 and 10,000 feet on all flights of four hours or greater duration.

Study T.O. 03-50-1