

AIR FORCE

OFFICIAL SERVICE JOURNAL

OF THE U. S. ARMY AIR FORCES



JUNE 1943

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AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Opinions expressed by individual contributors do not necessarily express the official attitude of the Army Air Forces or the War Department.

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June Brief

IF FLEDGLING fighter pilots heed the advice of one of the best in the business, they'll "get a chip on their shoulder" and keep it there. This comes from Colonel Robert L. Scott, Jr., former commander of U. S. fighter groups in China. Colonel Scott, whose combat record against the Japs includes at least thirteen enemy planes shot down, was asked to write an article for AIR FORCE based on his experiences in the India-Burma-China theatre. The article appears on Page 6. Colonel Scott is now on duty at the AAF School of Applied Tactics, Orlando, Florida.

YEARS AGO, students at the old Air Corps Tactical School at Maxwell Field, Alabama, foresaw the need for a school in aerial combat tactics and technique which would go beyond mere theory and concentrate on training under simulated combat conditions. Many of these old-timers, now Generals and Colonels for the most part, have seen their dreams come true with the establishment of the AAF School of Applied Tactics at Orlando, Florida. AAFSAT has as its first commandant Brigadier General Hume Peabody, who at one time served as Assistant Commandant of the tactical school at Maxwell. On Page 8 in this issue, General Peabody introduces the new school to personnel of the Army Air Forces.

FAST-MOVING, dramatic stories of combat have sprung by the hundreds, but for our money the story of Shorty Gordon, belly turret gunner on a B-17 operating out of England, ranks with the best of them. Shorty's exploits are set forth by Captain Bernard W. Crandell, former United Press writer now on duty with the Eighth Air Force. His article, "Angels Don't Shoot Guns," appears on Page 10.

"PREPARE FOR TROUBLE," in the finer sense of the phrase, should bring to the mind of every airman the importance of emergency kits. A full discussion of the contents and proper selection of emergency kits and equipment currently in use by the AAF has been prepared for AIR FORCE by the Arctic, Desert and Tropic Information Center. It appears on Page 34.

THE LITTLE GUY you see on the opposite page wandered into the AIR FORCE Editorial Office a few weeks ago under the sponsorship of Stan Eckman, well known cartoonist who at present is working with the Western Procurement District of the Materiel Command. Mr. Eckman's "pro-

tege" made such a hit that we introduce him to all our readers. What he needs most of all right now is an appropriate, "air-forcey" name plus a few suggestions on duties he might perform. We'll be glad to receive your choice of a name for the little man and have you issue a few orders for his benefit. Mr. Eckman will do the rest.

MAJOR STEPHEN L. GUMPORT, first flight surgeon on duty along the central African air route, relates his experiences in an article on Page 18. Since his return in February after more than a year in Africa, Major Gumport has been assigned to the Medical Division of the Air Transport Command Headquarters.

THE PERSONNEL classification problem is as old as the Army—any army. An interesting study of the manner in which the problem is being solved on the squadron level by the Army Air Forces may be found on Page 39. The author of the article is Lieutenant Matthew Huttner, statistical officer for a fighter group being readied for overseas action. Formerly engaged in radio and public relations work, Lieutenant Huttner assumed his present duties after attending OCS, Miami, and the AAF Statistical School at Harvard University. Lieutenant Huttner was graduated from the University of Pittsburgh (M. A. in social science) and in 1937 received the John J. Pershing Medal for military citizenship as a result of his fine record at Citizens' Military Training Camp.

TAD has become AFTAD. So what? Simply this: the Training Aids Directorate, which was a part of the AAF School of Applied Tactics in Orlando, now has become the AAF Training Aids Division, an exempted activity under the supervision of the Commanding General, with headquarters at One Park Avenue, New York City. The Assistant Chief of the Air Staff, Training, exercises supervision for the Commanding General. The training aids section in AIR FORCE this month is devoted to an explanation of AFTAD's field liaison organization, a round-up on available synthetic training devices and a background study on training literature. It begins on Page 26.

THE FRONT COVER photograph, with its unusual portrayal in shadows, shows a flight of B-25s winging over a desert stretch in North Africa on one of the hundreds of aerial missions which contributed so vitally to the rout of Axis forces in that theatre.

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CROSS COUNTRY

The new air-sea rescue program, and other developments of the month within the Army Air Forces

A COORDINATED program to handle the rescue of air crews forced down on land and sea has been newly established by the Army Air Forces.

More and more attention has been given air-sea rescue work, but it has continued to be handled largely as a local problem. Now the responsibility for developing and supervising the operation of a working system rests with a single agency—the Air-Sea Rescue Wing of the Flight Control Command.

We can't give you all the details of the program, for much of it is still in the making, but plans call for air-sea rescue squadrons to be stationed throughout the world. These squadrons, some of which are now being activated, will be made up of specially trained personnel; many of the men in command will be those who learned forced landing procedure the hard way—from experience. The squadrons will operate in combat theatres and on the fringe of such theatres, as well as along our own shores and along air transport routes wherever such services might be required.

Special equipment will be brought into play. Plans call for utilizing helicopters, PT boats, dog sleds, snow plows and liaison planes, as well as conventional aircraft, to give all possible aid to air crews who have been forced down.

The first big job will be the standardization of procedures regarding the ditching of multi-engined aircraft at sea, and for bailing out, parachuting, and the like. Right now, the Command needs all the information and suggestions it can get, especially on the subject of ditching at sea. The experiences of crews who have been forced down will be most valuable. The Commanding Officer of the Command asks officers designated to question crews after ditchings to send in complete reports, which should include the pilot's own story and answers to such questions as: Was the pilot satisfied

with the ditching procedure followed? If not, what does he specifically recommend? If the emergency equipment wasn't satisfactory, what was most in demand? The reports should include the type and model of aircraft and emergency equipment used. Such information should be sent to Headquarters, Flight Control Command, Winston-Salem, North Carolina.

The educational side of the program will be handled by the Air-Sea Rescue Section of the Command's Safety Education Division. Movies, booklets, posters and manuals will be used to tell you what to do in emergencies.

A manual now being produced in cooperation with the Bombardment Department of the Army Air Forces School of Applied Tactics will outline approved procedures for ditching medium and heavy bombers, and for individual bail-outs. A booklet, "Swimming Through Fire," soon to be available, will show you how to swim through fire in the event the water is covered with burning oil and gasoline. An air-sea rescue movie to be known as "Ditching" will outline the approved methods of ditching multi-engined aircraft.

Two manuals—"Jungle and Desert Emergencies" and "Arctic Emergencies"—are off the press and are being included in the jungle and Alaskan parachute emergency kits (Types B-2 and B-1). In addition, a limited number of the manuals will be available for use in schools and training areas.

A movie titled "On Your Own in the

Arctic" will put the information contained in the Arctic manual in graphic form. Other movies now in the planning stage include "How to Live in the Tropics" and "How to Live in the Desert."

Supplementing these mediums will be two series of posters showing in step-by-step form the bail-out and ditching procedures for the B-17, B-24, B-25, B-26 and A-20. These posters will go to schools, operations offices and operational bases.

As the air-sea rescue program develops, its many phases will be covered in future issues of AIR FORCE.

MORE ABOUT HELICOPTERS

All official world records, including the altitude mark, have been broken during routine testing of the Army helicopter, and under stimulus of the successful tests, larger



Make your reservations early.

helicopters are under development by the AAF Materiel Command. In fact, it is reasonable to assume that ten to twenty place helicopters can be built; top-flight speed would be in the neighborhood of 150 miles an hour, utilizing the present principle of power.

We've mentioned that helicopters are planned for use in air-sea rescue operations. Also, tests now underway will determine to what extent this type of aircraft will be used in our anti-submarine work.

For the last seven years all military development work on rotary wing aircraft has been conducted by, or under the supervision of, the Army Air Forces. In the March issue of *AIR FORCE* we covered the Army's first experimental helicopter, which was officially accepted in May, 1942. The craft was a success but its performance, capacity and speed were limited. Much progress has since been made.

Upon completion of testing at Wright Field, production orders for the helicopter were given by the Army. From this production order the Navy is to get three experimental models and one service test model.

SUBJECT: COMPRESSIBILITY

Not long after we had completed work on the May issue and sent it off to press, a letter arrived from Colonel Ben S. Kelsey, author of the series of articles on compressibility which was concluded with that issue of the service journal.

The opening paragraph told us that Colonel Kelsey had dictated the letter in a West Coast hospital while nursing an ankle injury sustained in a bail-out from a P-38 during the course of a dive investigation. (He is now engaged in fighter aircraft research work for the Materiel Command.) It was too late to fill the Colonel's request and print his message along with the concluding article on compressibility, so we are doing it now. This is what Colonel Kelsey had to say:

"1. Having just had an airplane disintegrate with me in a compressibility dive during the course of flight research in this field, it seems as though some of the items covered in the compressibility discussion need more emphasis.

"2. At best, compressibility is an unpleasant and dangerous region closely associated with trouble. The principle of learning how to 'stay out' rather than how to 'get out' is of primary importance.

"3. The lift and balance, or trim, of the airplane depend on an entirely different type of airflow than that with which we are normally familiar, so that the usual change in attitude, change in flight path, or accelerations which we use normally to indicate what is going on, may no longer apply. A straight-down dive, for instance, may be trimmed with zero stick force, then with application of full tab, or destructive elevator displacements may produce no change in attitude or flight path. The maximum lift is limited, just as it is in the regions beyond the normal stall, so that changes in attitude, if attained, may produce nothing except destructive distribution of load on the wings or tail.

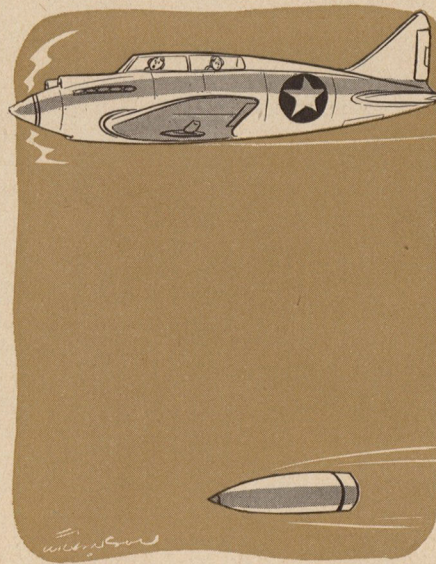
"4. Due to the speed, the aerodynamic forces are capable of shucking tabs, elevator, tails, and wings off a plane as easily as you would flick cards off the top of a deck.

"5. Recoveries must be limited to a slow and easy pattern, using moderate tab displacements and moderate stick force applications. It's a long way out and easy does it. Care must be exercised to ease off on recovery application as progress is obtained to avoid equally disastrous reaction as compressibility lets go its hold.

"6. The controls can be rigid, heavy, or sloppy, depending on the airplane and the flight condition.

"7. Avoid using ailerons or any control you don't need to avoid starting an over-balanced or flutter condition.

"8. Buffeting will usually be present and probably increases with recovery efforts. This



"Fast? Look what we're passing!"

— FRED WILKINSON

has to be endured and mild or moderate recovery procedure must be constantly maintained. However, the controls should be restrained from motion insofar as possible to avoid destructive oscillation. This applies particularly to ailerons.

"9. Don't let familiarity with the edges of the phenomena breed contempt. It only takes a little slip to have Old Man Compressibility grab you with one hand while he takes you apart with the other. The result can be more than a little alarming and confusing.

"10. Incidentally, parachute jumping at high speeds involves its own hazards. The harness must be particularly snug fitting if it is to stay on."

"11. We are on the track of solution, but the region of high speed, particularly above 20,000 feet, demands plenty of respect, and I am talking from the jail."

We don't wish for more bail-outs under such conditions, for Colonel Kelsey or anyone else, but we do hope to get more letters "from the jail," if such has to be. We can't think of a better start toward solving many of the problems confronting us—no matter what the field of work—than an exchange of ideas for the benefit of all personnel.

THOSE GROUND OBSERVERS

Stories of persistence, ingenuity and unflinching devotion to duty on the part of volunteer ground observers in the Aircraft Warning Service are legion. We mention here only a few of the instances which have come to our attention:

Sixty-four-year-old Charles Holmes and his dog Trixie spent 4,000 hours on duty during the first year of war at an observation post far up on the rocky, barren foothills of the western slopes of the Sierras behind Bakersfield, California. Trixie was taught to bark when he saw or heard a plane.

Two of the five members of the crew of an Army bomber which crashed about half a mile off the coast of Oregon were rescued thanks to the fast work of Observer Charles Voorhees, who saw the plane go down from his post near Seaside, Oregon, and flashed a quick message to the Portland Filter Center.

Mr. and Mrs. John Jeans saw a fighter plane fall into Fern Ridge Dam Lake near their home just outside Eugene, Oregon. Mr. Jeans went to the rescue in his outboard motorboat while Mrs. Jeans called a nearby observation post. Within eight minutes after the crash, the pilot, suffering from shock, was in the Jeans home and fifteen minutes later an ambulance, summoned by the ground observer, arrived to take him to a hospital.

Two observers near Sheridan, California, saw a truck and trailer skid off the highway on to the tracks of the Southern Pacific Railroad. One of the observers drove to another town up the line and an oncoming train was flagged to avert a wreck.

MORE LOST CHUTES

Captain Raymond A. Fitjar, commanding the 491st Bombardier Training Squadron, AAF Bombardier School, Midland, Texas, reports three chutes are missing. Their serial numbers are 41-1928, 42-53174 and 42-57119. Inventory your chutes and if you spot one of these numbers, notify Captain Fitjar.

VICTORY GARDENS

The War Department encourages the planting of victory gardens as a voluntary off-time activity at posts, camps and stations, providing (1) approval is granted by the CO so as not to interfere with the primary mission of training, (2) planting is done where the equipment and tools are on hand or readily available and no additional farm implements are necessary, and where soil is suitable and plots are reasonably available to quarters, (3) gardens are of such size and are planted with "such vegetables" that military personnel in the time available can care properly for the gardens, and (4) that food so produced will be for the consumption of military personnel only and not for sale to civilians.

First word of an Air Force victory garden in actual operation comes from Bolling Field where farm-minded personnel looks to a cultivated 38-acre tract for some

10,000 cabbages, 20,000 tomatoes, 5,000 eggplants, 5,000 pepper plants and eight acres of corn. First Lieutenant Frank R. McFarland, Jr., former farm manager and graduate of the University of Maryland Agricultural College, is in charge of the project as Post Farm Officer.

BISMARCK SIDELIGHTS

In answer to a cabled request, these sidelights on the Battle of the Bismarck Sea, which we discussed last month, were dispatched to AIR FORCE by Headquarters of the Fifth Air Force in the Southwest Pacific:

Lighting a Fuse

One incident that occurred early in the three-day engagement last March had much to do with the ultimate outcome. It involved the lone B-17 lost in the battle. The crew of this bomber was forced to hit the silk after the ship had been set ablaze by enemy fire. The men would have had only the barest chance of survival once they touched the surface of the water as the sea was filled with sharks. But these crewmen didn't even get that chance. As they floated slowly downward about a dozen Jap Zeros broke off their combat with P-38s and made pass after pass at the airmen dangling defenselessly in their chute shrouds. The scene was witnessed by all our flyers engaged in the fight, and others were given a complete fill-in on details later. From that moment on, American airmen gave no quarter. Even the heavy B-17s began diving on ships and barges, their concentrated fire sending smoke, flame and debris high into the air and littering the sea with struggling Japs. The sharks formed a mop-up crew and had a field day. Sharks came from miles around to account for a large share of the estimated 15,000 Japs who lost their lives in the engagement.

Graveyard

Before the B-17s, the B-25s and the A-20s, the P-38s, the P-40s and P-39s of the Army Air Forces, plus the RAAF Beaufighters and Catalinas, called it a day in the Bismarck Sea encounter, all that remained of a 22-ship Jap convoy with its tons of equipment and thousands of troops were oil slick splotches, debris of shattered cargo and escort vessels, smashed hulks of lifeboats and barges, and the tattered bodies of Jap soldiers and sailors. This was why the Bismarck Sea became known to the officers and men of the AAF who took part in the engagement as the "Bismarck Graveyard."

Weather Break

When the battle opened up,—in fact when the lone B-24 on reconnaissance first spotted the Jap convoy, the elements favored the enemy surface craft. Our attacking planes could only strike and hope for results; they couldn't see. But at 1000 o'clock on March 3 the cloud curtain rolled back. There in plain view and under almost cloudless skies bobbed the bulk of the enemy ship concentration. On that day every available plane was thrown into the task of demolishing the Jap convoy. (Continued)

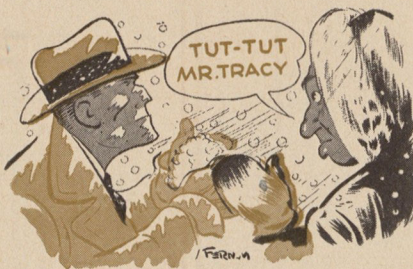
AIR FORCE, June, 1943



TIPS FROM THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER

AIRMEN on combat missions in the Southwest Pacific have taken to wearing G. I. shoes, paratroop or marine-type boots instead of the flying boot. Reason: Bail-out experiences reveal that flying boots frequently snap off in descent, resulting in serious discomfort and injury when ground travel on bare feet is attempted over coral-strewn areas, hot stony terrain, or in jungle bush.

IT'S A GOOD IDEA for crew members on flight missions in any theatre to provide themselves with a good shoulder-type holster for small arms. Web-type or leather pistol belts around the waist are frequently broken in parachute descent; often the weapon falls out of the conventional holster. Loss of the weapon may mean the difference between life and death. A good shoulder holster is the best insurance against such loss.



A RECENT Dick Tracy adventure depicts that stalwart hero rubbing frostbitten skin with snow. The great Tracy ought to know better. NEVER RUB SNOW ON FROST-BITE! It's a dangerous thing to do because (1) it increases the freezing; (2) the rubbing tends to break the frozen tissues and will cause open wounds and possible infection. Slow thawing is the answer, Dick. For example, the right way to thaw a frozen hand is to warm it against the skin under your armpit, against your chest or between your legs; a frozen foot can be thawed between a companion's thighs or against his abdomen. And Dick, don't ever use hot water to thaw frostbite. Cool or lukewarm water is all right.

AN OPERATIONAL hazard in desert flying, especially at takeoff and landing, is encountered in the sand-swirls and minor whirlwinds generally found close to the ground. These occur only during the day and are easily seen. They should be watched for and avoided.

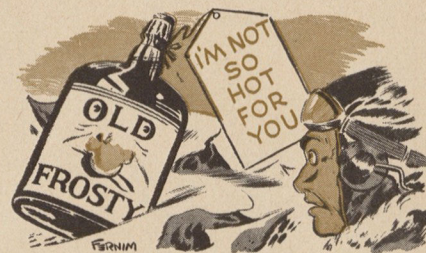
The Arctic, Desert and Tropical Information Center welcomes contributions from all Army personnel with knowledge of the non-temperate theatres of operation. Submit to: Arctic, Desert and Tropic Information Center, Eglin Field, Fla.

ARCTIC TIP: A hot thermos bottle may be kept hot much longer by wrapping it in a sleeping bag, heavy sweater or other insulating material. At extremely low temperatures there is danger that the cork may freeze in; to prevent such freezing fill the thermos to overflowing so that the hot liquid remains in contact with the cork at all times.

THE SECRET of driving motor vehicles in desert sand is to keep rolling with as little wheel slippage as possible. Don't use excess power and spin your wheels. Nothing will get you stuck quicker or more thoroughly. If you come to a standstill, don't try to get out by spinning the wheels. You'll only go in deeper. Shovel the sand away from in front of both rear and front wheels or decrease your tire pressure. If you must stop in sand, stop on top of a hill or a mound so that you can start downhill.

SOME IDEA of the character of the global war we're fighting is reflected in these facts: The hottest spot on earth is Azizia, Tripoli (in the African theatre) where a shade temperature of 136° F. has been recorded; the coldest place is at Yakutsk, in Siberian Russia, where 90° below Zero has been reached.

CONTRARY to popular belief, liquor is no asset in Arctic regions. Physiologists tell us that alcohol causes the blood vessels to dilate, which in turn results in accelerated heat loss and more-rapid-than-normal cooling. Don't be deceived by that rosy glow or warm feeling you get after a shot of the stuff. You'll just be inviting quicker freezing. Liquor in the North Country has its customary social advantages but it is not a fortifier against freezing cold.



INSECTICIDES for jungle fighters are now packed under pressure in tomato-can-size metal containers. Pressing a valve releases a bug-blasting mist that fumigates a regulation pup-tent in a few seconds.

Slap-happy Jap

The intensity of the March 3 raids, the accuracy of AAF bombs and the general fury of American airmen threw enemy defenders into confusion. One Jap cargo ship inadvertently rammed another, but no one will ever know whether the collision was of sufficient force to sink either ship because within a few moments both were destroyed by American bombs. Our planes attacked from all directions. Anti-aircraft guns on the ships were waving madly about, trying to fire everywhere at once. Several times our medium and light bombers roared in mast high and encountered no flak opposition at all.

Pop Gun

B-17 Waist Gunner Sergeant Henry Garcia of Los Angeles had the last laugh on the boys who kidded him for taking his rifle along on a mission. The sergeant was working his machine gun overtime holding off Jap Zeros when suddenly his ammunition gave out. Jap pilots, seeing Sgt. Garcia's fire cease, moved in for one more pass on his side of the B-17. The sergeant jammed his rifle full of tracers and let go at the oncoming Zeros. The ruse was successful; the Japs mistook the rifle fire for machine gun tracers and veered off without causing any trouble.

JUST A REMINDER

Take stock of these tips published for your benefit at the suggestion of the Flight Control Command:

Harness

Why don't more pursuit pilots use the shoulder harness? With a crash coming up, all the pilot has to do is pull the locking lever and the harness will give him complete protection from head and face injuries resulting from impact with the dashboard or gunsight. When he wants to get out it's no trick to release the lever or simply slip out of the harness. Remember that the harness is there for your protection and the protection is adequate—but only if you're wearing the harness.

Night Adapter Goggles

Apparently not all night-flying pilots of the AAF are provided with dark-adaptor goggles, or know how to get them. The goggles in question are officially known as "Goggles, Assembly, Polaroid type D. A., Class 13, Stock No. 8300-343575" and can be obtained through the regular supply channels of any organization by applying to the Air Service Command.

The goggles which have red lenses, are to be worn by pilots for at least thirty minutes before taking off after dark. They do not interfere with the normal use of the eyes such as reading and playing cards, but they greatly increase the probability that such enjoyment can be carried on indefinitely.

Cap Spike

You probably never considered your cap a dangerous article but it can be.

Reports have been received of flying per-

sonnel suffering some nasty gashes from the end of the screw post on the service cap insignia when the cap gets jammed down during rough weather.

Take a look inside your cap, and if you have a half- or three-quarter-inch spike pointing at your forehead you'd better have it cut or filed off.

A CLARIFICATION

The need for clarification of two statements appearing in the Cross Country sec-



"Most conscientious bombardier I've ever seen."

—CPL. PAUL J. KAATZ

tion of the April issue of AIR FORCE has been called to our attention.

In explaining the procedure to be followed by enlisted men in applying for aviation cadet training, it was reported that the company commander had the authority to indorse or reject the enlisted man's application. Actually, the company commander cannot reject the application, but has authority only to forward the application and other necessary papers, with his recommendation and appropriate remarks, to the Commanding General of the proper service command. It is also called to our attention that a recent directive from Headquarters to the Commanding Generals of the Air Forces and the Air Forces Commands states:

"Because of the urgent need for greater numbers of aviation cadets, it is desired that you bring this opportunity to the attention of every potential candidate and see that his immediate superior officer does not disapprove the application or subsequent transfer."

The second statement in question has to do with the new bombardier-navigator training program. We reported that those bombardier-navigator trainees who are appointed flight officers upon completion of the first phase of their training will be commissioned Second Lieutenants on completion of the second phase. Actually, such flight officers will be commissioned Second Lieutenants provided such a commission is recommended

by a board of officers. Otherwise, they remain flight officers.

AIR FORCE is indebted to the Office of the Assistant Chief of Air Staff, Training (Military Personnel Division), for making these clarifications.

SCRAP

From San Angelo (Texas) Army Air Base comes the observation that the bombardier cadet of the AAF Flying Training Command is among the top contributors in the Nation's scrap drive.

"Every time a cadet at San Angelo drops a 100-pound practice bomb," this statistically-minded correspondent reports, "he adds 15 pounds of metal to the scrap pile. At the present rate that adds up to something considerably over 7,000,000 pounds a year."

VOLLEY BALL

It has been reported that a "bay chief" of a training squadron at the Advanced Flying School, Altus, Oklahoma, placed a notice on his bulletin board that all men must get up at 5:30 a.m. to clean the barracks. He added a penciled postscript: "If you play ball with me, I will play ball with you."

A khaki-clad wag pinned a note beneath the notice:

"Dear Sergeant," it read, "Sorry, 5:30 a.m. is too early to play ball. We will be glad to play ball with you at eight. Sincerely, The Opposition." (P.S.—The game started as originally scheduled.)

From the Commanding General,
Army Air Forces, dated April 22, 1943:

To all personnel of the Army
Air Forces:

In violation of every rule of military procedure and every concept of human decency, the Japanese have executed several of your brave comrades who took part in the first Tokyo raid. These men died as heroes. We must not rest—we must redouble our efforts—until the inhuman warlords who committed this crime have been utterly destroyed.

Remember those comrades when you get a Zero in your sights—have their sacrifice before you when you line up your bombsights on a Japanese base.

You have demonstrated that the Japanese cannot match you in aerial combat or in bombardment. Let your answer to their treatment of your comrades be the destruction of the Japanese Air Force, their lines of communication, and the production centers which offer them opportunity to continue such atrocities.

BATH

At one stage in the rout of Axis forces in North Africa, American troops captured among other booty a real, honest-to-goodness porcelain bathtub which probably adorned the quarters of some ranking enemy field officer. Between stabs at the retreating Axis troops, enlisted men took turns sitting serenely in this prize of war, dreaming of those little tiled rooms at home, while their pals poured in North African water from buckets.

ON LAND IN A LIFE RAFT

Rubber life rafts can come in handy even on dry land, take it from First Lieutenant Sam Constantino, Air Transport Command pilot, who recently brought his ship down for a crash-landing among the African sand dunes. Lieutenant Constantino and his crew inflated the life raft and used it to good advantage as protection against the cold wind at night. Incidentally, Lieutenant Constantino and his crew made it to safety by hitching a ride with an Arab camel caravan after seven days of fruitless wandering.

PAGE ST. PATRICK

When the 1,200-acre tract was cleared near Orlando, Florida, as the site for Headquarters of the AAF School of Applied Tactics, engineers found the terrain a favorite playground for hundreds of snakes. Even after AAFSAT officers began to move in and set up training classrooms and staff offices, the reptiles continued to put in an occasional appearance to protest this intrusion. Most of the nuisance-makers were put to death and promptly forgotten—physically speaking. But not so with a big, fat cottonmouth moccasin and a coral snake which happened to meet their timely end near the medical buildings of the Air Service Department. True to his medical background, Major G. W. Holt, flight surgeon, pickled the specimens in alcohol. They now repose harmlessly, though prominently, in glass jugs on the Major's desk. This is the same Major Holt, incidentally, who wrote "Why Black Out?" appearing in the May issue of AIR FORCE.

PLAGUE

A corporal now stationed at an Alabama airfield attributes his recent divorce to mother-in-law trouble. Comes now word that his ex-wife's mother has been made a third officer in the WAACs, and is headed—yes, to that same Alabama field. Naturally, by reason of rank, she will be one of the corporal's superiors. Anybody know of a nice soft berth for this guy in New Guinea?

HANDY GADGETS

In the soon-to-be-ready hopper at Wright Field are these items which are destined to make life more pleasant for airmen who are forced to exchange their planes for rubber life rafts:

A salt water still, which handily converts ocean brine to pure drinking water; a sling-

shot device for better seagull-shooting; a special mirror capable of reflecting the sun's rays to attract the attention of planes flying as high as 5,000 feet, and a vest-pocket container which, with a minimum of adjusting, can be used to catch and store rain-water.

WRONG ROOM

Sergeant Alvin O. Crabbe of the finance staff has inadvertently become the champion test-taker at the Newport (Arkansas) Army Air Field. Called to appear before the O. C. S. Board several weeks ago, Sergeant Crabbe was directed to the ground school building for the necessary examination. He was ushered into a classroom, handed a sheath of papers and told to get to work.

For three hours Sergeant Crabbe sweated out the test and, turning in his papers, he inquired of the attending officer if this exam represented a departure from the usual O. C. S. test. Whereupon the astonished officer informed Sergeant Crabbe he had just completed a difficult examination for Army Specialized Training Program. The O. C. S. Board had been in session next door. The sergeant's appearance before that body was promptly re-scheduled for the next meeting.

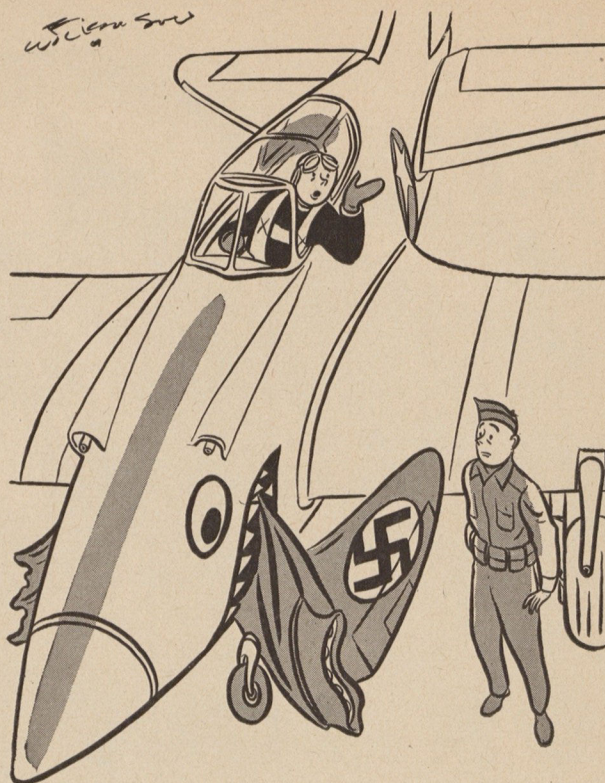
P. S.—He scored exceptionally high on the A. S. T. P. test.

BRANCH BANK

Our attention has been called to a banking service scheduled to begin at Sheppard Field, Texas, about June 1. The First National Bank of Wichita Falls, Texas, is opening a branch at the post, offering the usual banking privileges to military and civilian personnel with the exception of making loans. Similar enterprises have been established at several other Air Forces installations.

SUPPLY LINES

Some interesting figures on the movement of cargo and troops in this war as compared to World War I have recently been divulged by the War Department. Troops transported overseas during the first year of war totaled 891,827; the figure for the same period during the last war was 366,603. Cargo shipped to overseas troops, not counting that consigned to our allies, averaged 82 pounds per man per day, as compared with 43 pounds per man per day in 1918-19. During the first year of our



"I ran out of ammunition!"

—FRED WILKINSON


participation in the last war, approximately 1,725,000 measurement tons of Army freight were shipped overseas, as compared with 10,474,923 measurement tons in the comparable period of the present war. In one month last year the tonnage figure reached 1,554,127.

These figures do not include freight now moved by air transport, which is made up of articles of greatest strategic importance. As the projected program for the construction of transport planes is realized, more and more troops and larger and larger tonnages of cargo will be handled by air.

ALLIED INSIGNIA RECOGNITION

An instruction program has been inaugurated to enable U. S. Army troops to recognize more readily the insignia of rank in the combat forces of other United Nations. All training Air Forces and independent AAF Commands in the continental United States have been ordered by General Arnold to give instruction in recognition of United Nations insignia to personnel destined for overseas duty as "an essential part of military training."

Commanders are warned not to give instruction which obviously pertains to a particular theatre prior to movement of any unit to a staging area but rather instruction which pertains to all theatres in order to avoid revealing the unit's ultimate destination. Insignia identification posters designed to aid in the educational program may be obtained through the Special Service Section, Army Service Forces. —THE EDITOR.



GET A **CHIP** ON YOUR SHOULDER!

By **COLONEL ROBERT L. SCOTT, Jr.**
FORMER COMMANDER OF U. S. FIGHTER GROUPS IN CHINA

SOME fifteen hundred feet below the blue waters of Victoria Harbor were rippling in the light of the setting sun. Some of those waves were caused by the wind but a few of them started with the splash of nineteen Japanese Zeros which seven of us had shot down in the last three minutes.

Just then I crossed the southeastern tip of Hong Kong Island and saw one more silhouette of an airplane. My gun switches were already on, my gunsight was reflected brightly in the armor glass of my windshield. I moved to attack the other ship.

There was not an instant of debate whether it was a friendly plane, a shadow, or a bird. With everything forward—prop control and throttle—I took military power from the throbbing engine and attacked.

A split second before my tracers would have rattled from the six fifties of the P-40, I saw the other ship wig-wag its wings. Then I heard a Texas drawl, "If that's a P-40 in front of me, wiggle *your* wings."

I mean I "wiggled" them, too, for the guns of the other P-40 were pointing right at me and you don't argue or hesitate with a P-40's guns. Ask the Japs in China.

The simple fact that these two American fighters were the last ships in the air over

Victoria Harbor on that afternoon of October 25 meant the twentieth plane would not ripple the water that day. We were both *attacking*. There was not a single thought of defense or deliberation about whether the other plane was a friendly one. There can't ever be—or you will become the twentieth ship some day.

As for the two of us that afternoon, we were so glad to meet each other that we went into formation and arrogantly engaged in acrobatics as we passed over Kowloon and Canton en route back to our base in Free China.

THIS arrogance we call the "chip on the shoulder" that is just as necessary to fighter flying as formation or gunnery. It's the quality that gave western gunmen itchy trigger fingers. It's the heads-up way you have to play in this fast moving game in the skies.

To adopt it you must have developed a neck like an owl that lets you look around constantly while you're flying. You must have developed it while you were learning to fly and it must have grown with you until it becomes a movement that is as natural as blinking the eyes.

You've got to know that the little piece of

dynamite you call your home in the air is a flying engine with guns tied on and with you as its brain. You live or die together as that brain decides.

Your mind is at ease once you are on a mission for there can be no doubt but that you are flying the best equipment in the world, that you have received the best training anywhere, that you have everything to fight for. You can laugh and know that any enemy pilot who faces you in combat is a fool and will die. Oh, some lucky bullet from the ground may get you, perhaps some ricocheting burst from an enemy plane. But this man in front of you shoot you down? Never in all the world. For you've learned that you are better than he; you are what you have wanted to be all your life, the actuating brains of one of the greatest weapons in the world. You have six to eight .50 caliber guns in your wings or synchronized in your ship's nose and perhaps you are flying one with cannon.

Stop and think for a moment of what you have read of machine gun and rifle companies and battalions in other wars and then realize that you have at your very finger tips the trips to more shots per minute than the infantry battalion.

"Let your every thought be an offensive one and be mad as hell when you can't find an enemy to battle."

Your first mission is to escort bombers and get the offensive arm of our Air Forces to its objective and away. But you can also carry bombs and learn to lay them in the groove. Did you know that those six fifties on a P-40 can sink a Japanese destroyer alone? They can, but for effective action you, first of all, must know your ship.

FLYING must be second nature to you. You must be so good in formation flying that it has long since become a pleasure for you to sit there on your leader's wing or to assume the responsibility of leading other men. Your gunnery must be at least that of a sharpshooter, preferably that of an expert.

You don't have to be tall or short, young or old, rich or poor, fat or slim. There is no pattern for a fighter pilot. His physique waxes and wanes as the moon. But the quality that must be there is a spirit of adventure. It's the certain something that makes you want to fly the little ships alone with no copilot to talk to, no navigator to turn to for directions, no bombardier to aim your load, and no gunners to keep the enemy off your tail. This is no reflection on the pilots who want to fly the twin engine bombers or the heavy four-engine ones, or those who look to a life in the transports. They are all just as necessary as you. Let them fall down on their job and the battle is lost.

But you are where you are because you want your job more than anything in the world. You carry that chip of superiority along with you all the time because your character in the air must be that way. When the chips are down, you know you stepped into the mess all by yourself and it's up to you to get out—by your own ability and the knowledge of what your ship will do. But by your own proper planning beforehand you can enhance your chances of escaping tight squeezes.

The one thing that you must never do is wonder: Can I do this? Should I be here? Should I wait and see if that is one of our ships? Am I meeting a better pilot?

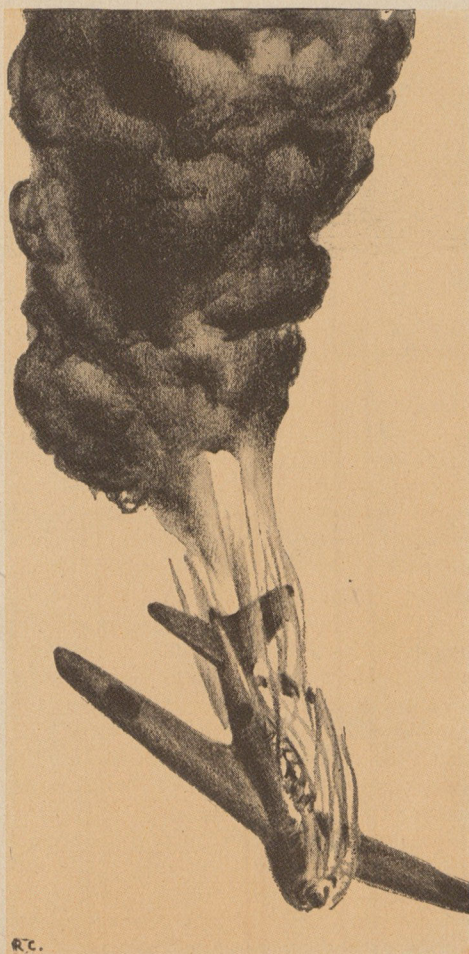
You must forget everything but that you are the best in the world. You must have long ago learned to shoot so that as each Jap makes a head-on run against you, you will be glad that he helped aim the guns for you. You must be saying, "You poor sucker, I'll kill you long before you come within range with your poor little guns."

Yours is the job where arrogance in the air is a necessity—you are looking for a fight. You are mad if you escort bombers and the enemy does not intercept. How are you going to destroy his air force if he doesn't come up to fight?

Afraid in combat? It will never enter your mind. There won't be time for prayer

or for fear. Sometimes when it's over you'll know that someone at home must have prayed for you. And you may experience fear later but not in the fight.

There was always a fear gnawing at my heart before the take-off for action. The night before I could never sleep. I could shut my eyes and see Zeros climbing into the bomber formation with cannon going, making their little smoke rings that floated out in front of the Japanese fighters. I would almost fall asleep with these images before me but then as I tugged desperately to get my fighter to them I would lose the race and see my own bomber go down in flames. Then I would jump wide awake for the hundredth time that night. Sleep would never come. Not from personal fear, but from fear that I would fail in my mission. Fear at first that combat would be unnatural for me, but never fear that some little bullet would hit me. I was too arrogant for that and you will be. You'll worry just like all of us do as you try to sleep the night before. Then as you stand around and wait the interminable seconds for the operations officer to brief your mission, you will be sharp



and cross with the crewmen. You may even gripe at the Chinese boy who serviced your ship for stepping on your chute, but it will be from the tension of the moment. When you take off you'll be the happiest man in the world. Soon you'll say to yourself, why don't the devils come up? Why?

And there they are. At the first instant, the steepness of their climb chills you, then their numbers, but now you remember there aren't seven of you this time. There's a whole group, and another is sitting up there in the sun as support, and the reserve is higher still, and this is where the Jap dies and you're attacking without realizing your move.

In seconds, it seems, it's all over and you're looking around in a sky that's filled only with American ships. And the white stars on the wings and fuselage look to you like a part of the United States—Main Street or the State Capitol or the Mississippi River. And maybe a cheer will rise to your lips and the world will blur from a tear that comes hot in your eye. You'll think it's a privilege to be here and do this job for the greatest country on earth, and you will realize that this is the way to keep the country you love just the way you want it. You'll insure by hundreds of such raids that your wife will live the way she was living when you first knew you loved her, your little boy will have the same future that you've always planned for him, your Main Street—your American Way of Life—will go on.

In a second that emotion passes and you're on the way home to base, sweating out your navigation and your gasoline. Then you're telling the boys who haven't been out yet that it's a cinch. "They blow right up when you get a good burst of fifties in on them. But, boy, they can climb!"

Then the routine begins all over—the impatient waiting and the griping for action.

It's going to do you and America a lot of good to see these hellholes we fight in, for when the war is over we will then understand the sacred thing that we have.

But as you ride out over the many fronts of this war, ride in confidence that you are better trained, you are in superior equipment, and you can outgun and outshoot any ship in the skies.

Let your every thought be an offensive one and be mad as hell when you can't find an enemy to battle.

Above all, never wait to be attacked. Get your gun switches on, get your gun sight on, get your controls on the throttle quadrant forward "to the firewall" for military power—and *attack, attack, attack!* Every fly speck, every vulture, everything that may be a plane is your target. Attack before he attacks you. Never have a defensive thought. ☆

FLORIDA'S *COMBAT* THEATRE

By Brigadier General Hume Peabody

COMMANDANT, ARMY AIR FORCES SCHOOL OF APPLIED TACTICS, ORLANDO, FLORIDA

A FLIGHT of B-17s roars out over the Gulf from Florida's west coast on a late afternoon bombing mission.

The distance between its base on the mainland and the target—marked by an aluminum slick on the surface of the water—represents the exact distance between an Allied bomber base in North Africa and an enemy airdrome on Sicily.

The B-17s reach their objective and drop their bombs. The mission progresses under conditions copied from a raid which actually had taken place several weeks before in the North African theatre.

Back on the mainland a night fighter squadron is alerted to intercept a flight of "enemy" bombers approaching the Florida coast. A completely equipped and staffed Aircraft Warning Service has picked up these "raiders"—represented by our returning B-17s—and is plotting their course as they move in from the Gulf.

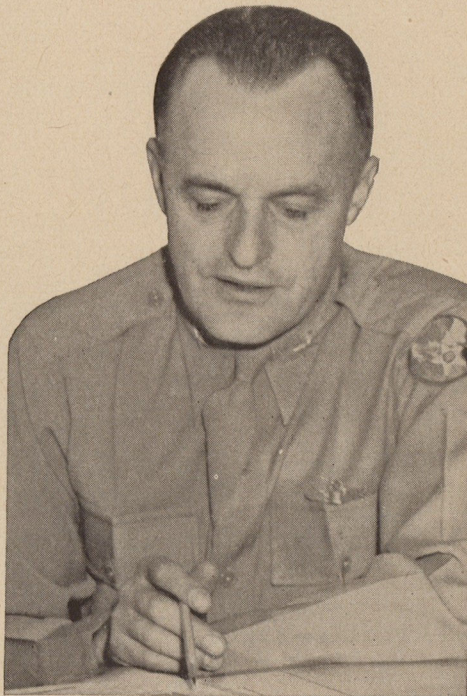
Searchlight batteries and anti-aircraft units, kept advised of the exact location of the bombers, are ready to spring into action.

The night fighters take off and, under the guidance of a central Controller, move out to intercept the raiders. Coastal searchlights suddenly come to life, catching the bombers in their powerful beams and carrying them along despite violent evasive efforts by the raiders to escape the shafts of light. With their targets standing out clearly, the night fighters then move in swiftly for the "kill." Here, too, actual combat conditions have been simulated in detail.

THESE demonstration missions are typical of those flown daily as an integral part of the training program at the Army Air Forces School of Applied Tactics.

Back of such missions are days of academic training at AAFSAT in up-to-the-minute tactics and technique, lecture course in maintenance and supply, in aviation medicine and combat communications, instruction in air crew briefing and intelligence interview, and the countless other details that go to make a typical air force.

For all practical purposes AAFSAT is an air force—an air force operating in a "war theatre" which embraces some 8,000 square



The Author

miles of territory in west central Florida. The AAFSAT air force has a Bomber Command, a Fighter Command, an Air Support Command and an Air Service Command.

From three of the twelve airdromes in this theatre heavy and medium bombers fly countless missions copied in detail from missions flown in combat theatres over the world. Fighters operate from five other bases, one of them a combat school for night fighters, the first in the United States.

Air support units, including light and dive bombers, troop carrier planes and gliders, and observation aircraft, are based on three separate airdromes. The other base is a "forward area" airdrome hacked out of the Florida brush by aviation engineers and used to simulate rough conditions to be encountered in many of the war theatres.

In addition, a complete air service organization from a general depot—the only one of its kind in the country—to the lowest field echelon operates full time to keep both planes and personnel in A1 fighting shape.

At AAFSAT headquarters in Orlando, where all academic work is accomplished, the high command sets up demonstration missions, keeps careful tab on their progress through complete operations center facilities, and makes detailed studies of the results.

OUR primary purpose at AAFSAT is to train air force cadres—key personnel framework for all new combat groups—in the latest combat tactics and under operating conditions approximating as closely as possible those with which these officers and men will be confronted in the various war theatres.

To accomplish this mission we are not operating on theory, nor on the mere basis of intelligence reports alone. We have as instructors and advisors outstanding combat-experienced officers, many of whom have spent more than a year in war theatres around the world and participated in one important aerial mission after another. In addition to these seasoned AAF instructors, AAFSAT enjoys the valuable assistance of Royal Air Force veterans in setting up training courses and field problems.

In the Air Defense Department of AAFSAT alone, more than sixty instructors have had overseas experience. Among them are Colonel Robert L. Scott, Jr., whose military career in the Far East has been one of the most brilliant of the entire war; Colonel Orrin L. Grover, who served through the Bataan defensive in the Philippine campaign and later in Australia; Lieutenant Colonel Oswald Lunde, whose combat service has taken him to the Philippines, Australia and North Africa; Lieutenant Colonel Walter B. Putnam, a veteran of the Southwest Pacific theatre; Lieutenant Colonel Winston W. Kratz, who was assistant A-3 of the Eighth Air Force for more than nine months; Colonels Arthur B. Nicholson and Thomas J. Cody, both veterans of the North African campaign; Major Charlie R. Bond, a member of the American Volunteer Group in China for more than a year and a half, and Captain Reade F. Tilley, who served with the RAF in England and Malta before transferring to the Army Air Forces.

Several former officers of the 19th Bombardment Group are on the staff of Bom-

AIR FORCE, June, 1943

Introducing the Army Air Forces School of Applied Tactics where key personnel of new Air Force Groups get a taste of modern air warfare before going overseas.

bardment Department at AAFSAT, including Lieutenant Colonel James T. Connally, Group C.O. for several months in Australia. Majors S. R. Patterson and Max Fennell, who served with the Ninth Air Force in Cairo, also are training bomber personnel. Lieutenant Colonel C. B. Whitehead, with the RAF Bomber Command during the early days of the war, is chief of academic instruction for the Department.

In air support, Lieutenant Colonel Ronald D. Hubbard and Major James B. McAfee are passing on techniques in light and dive bombing they used successfully as members of the 3rd Bombardment Group in the Southwest Pacific. Their former C.O., Colonel John H. Davies, took a leading part in setting up AAFSAT's air support program. Lieutenant Colonel C. E. Hudgens, who participated in the troop carrier mission from the British Isles to North Africa at the outset of the campaign in that theatre, offered valuable aid in the troop carrier training program while at AAFSAT with his own cadre.

These are but a few of the combat veterans lending a touch of war realism to the training courses. It is under the guidance of these officers that another purpose of the school is carried out—the continued development of tactics learned in combat theatres.

Afforded the use of the latest types of equipment, AAFSAT instructors and students are able to explore new techniques, put them to rigid tests and, if they prove successful, pass them on to war theatres by the time the new equipment gets there. Thus AAFSAT becomes a tactical laboratory as well as a school of instruction in tactics.

By the same token, new tactics developed in combat theatres from time to time are made a part of the training program at AAFSAT. This is one of two principal methods employed to keep AAFSAT instruction from becoming static. The other is represented by a regular turnover (about five percent) of instructors. Now and then instructors leave AAFSAT to head up their own groups and squadrons bound for war theatres, and fresh instructors arrive from combat zones to replace them.

THOSE of you who come to AAFSAT will find at Orlando the school headquarters and some 1,200 acres of classrooms, buildings housing synthetic training devices, A.W.S. filter and control centers, barracks and mess halls. Here is where you will receive your academic training.

Chances are you will come as a specially selected member of a cadre—for the pur-

pose of illustration, say a bombardment cadre. In your unit, picked from one of the training Air Forces in the United States to form the nucleus of a new Bombardment Group, will be about 150 officers and men ranging from the Group C.O. to supply sergeants and gunners.

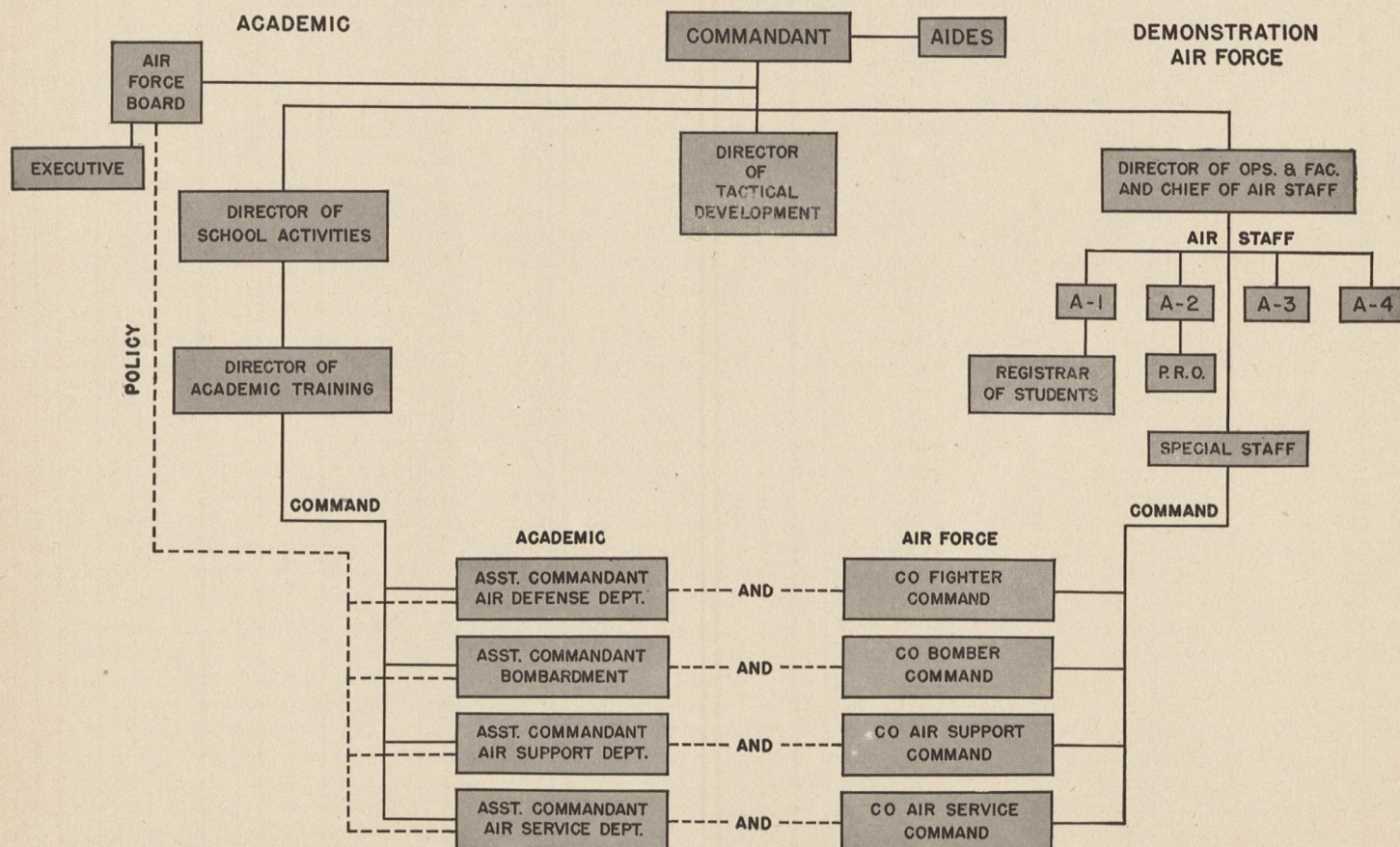
At the outset you will receive a four-day orientation course. This goes for everyone coming to AAFSAT, from corporals to generals. The course brings students up to date on broad developments within the Army Air Forces and refreshes their minds on military topics which were supposed to have been absorbed in earlier training.

Operational personnel—pilots, bombardiers, navigators, radio operators and gunners—then will hear lectures on tactics employed in the various combat theatres and operate the latest synthetic trainers in practical illustration of the lectures. Meanwhile, the administrative and service personnel of the cadre—adjutants, intelligence officers, medical officers, maintenance men, supply sergeants and the like—will take classroom courses in the Air Service Department.

Your cadre will re-form for the final phase of the training at one of the AAFSAT bomber airdromes. There you will eat, sleep and operate under simulated combat conditions for about two weeks. You who are air crew students will fly missions with officers who know first hand what it means to push through damaging flak and fight off enemy interceptors to reach a target in the Mediterranean, or in Western France, or in the Solomons.

(Continued on Page 29)

ARMY AIR FORCES SCHOOL OF APPLIED TACTICS





Shorty Gordon

Angels

DON'T SHOOT GUNS

By Captain Bernard W. Crandell

HQ. EIGHTH BOMBER COMMAND

THIS is meant to be a story on the toughest gun position in a Flying Fortress but if it incidentally deals with the toughest little gunner ever to lay into a pair of cold blue fifties you may conclude that it takes a lot of both—metal and man—to do the right kind of a job on enemy fighters.

The Fortress can be most any one, just so long as it's heading out over the English coast toward the war mills of Europe with a bay full of bombs and belts choked with bullets.

The gunner, however, will be Shorty Gordon, who operates from a ball turret as round as the oranges that grow back home on his mother's San Fernando ranch.

At the pay table the signature behind the \$172.80 is Staff Sergeant Lee C. Gordon, but when he's hanging up there under the belly of a Fort 20,000 feet above Germany, switching his long-barreled fifties at the buzzing Focke-Wulfs and Messerschmitts like a cow bothered by flies, he's plain Shorty Gordon, a hell of a good gunner.

When he's not flying he's talking about it so, figuratively at least, Shorty Gordon lives in that ball turret.

Two-thirds of his turret projects from the bottom of the B-17 to meet attacks from below. In it are two .50 caliber machine guns, several hundred rounds of ammunition, a range mechanism, gun sight, switches, buttons, pedals and petcocks. The gunner gets what room there is left, squeezing in between the guns, legs thrown forward, left foot on the range pedal and right foot on the interphone switch. His knees rest so close to the bolt mechanisms their action

during combat often tears his clothes. Remarkable as this strictly G. I. invention may be, it is not nearly so popular in a particular Fortress squadron in England as the 20-year-old kid who operates it.

For Shorty hasn't missed a mission yet.

His feet have been frozen and his electrically-heated baby blue jumper has failed him at 45 degrees below zero.

He has had to work all night inside the wing of a Fortress and go up to fight the Luftwaffe the following day.

He has had to beg, wheedle or steal his way to a gun position in another ship when his own was out of commission.

He has worked on frozen guns at 24,000 feet while fighters were boring in and flesh was tearing off his fingers each time he touched his guns to coax them back into action.

But he hasn't missed a mission yet.

Before Shorty's virtues get out of proportion, let it be said that Shorty is no angel. Because angels don't get drunk and angels don't say "I'm the best damn gunner in this group" and angels don't land in the guardhouse and angels don't gamble or bootleg. And angels, as we all know, don't shoot guns.

Shorty, you see, may be short but he ain't sweet. To be exact, he is 5 feet 2 inches short which—believe it or not, you Air Force experts—might be a bit too small. Most gunners find a ball turret like a straightjacket, but Shorty slips in easily. In fact, he claims he's the only gunner this side of the Atlantic who can wear a parachute inside the turret. He needs a chute to fill up space. When he doesn't wear one he uses a pillow to prop himself up to the sights.

Shorty's pals get a laugh over those pillows. He's always had to use them for one thing or another. Back in the United States, at their base in the desert, a 1931 Chevvy

came tooting home to them every night. On the rear seat rested the inevitable case of beer, and on the front would be Shorty, a ridiculous figure propped high on pillows peering over the edge of the windshield.

Shorty still prefers his pillows to a parachute—if the mission looks easy.

PREPARING properly for a five-hour ride in an unheated ball turret, exposed to the full blast of the slipstream, is as important as having clean guns. For if the gunner can't take the cold, the Fortress might as well have stayed home.

What does Shorty Gordon wear on a mission? We'll start him right from scratch, from a warm G. I. cot at 0430 o'clock on a cold winter morning.

First, Shorty, you'll get dressed. Step into that clean woolen underwear and clean woolen socks and be sure they're clean because if they're not moisture will collect and freeze. Now pull on your electric suit, that one you call your "zupe suit" just because it has zippers. And the electric shoes and gloves. Next is your cotton gabardine summer flying suit, and a thin leather jacket over that. You wear RAF flying boots because they're higher than your own G. I.'s and they keep the wind—that 45-below-zero wind you found over Wilhelmshaven—off your legs. A white scarf of parachute silk to keep the heat down in your suit, and your leather helmet, and you're ready to go.

You've had a pass at the chow line now, Shorty, and here is the briefing. St. Nazaire, the U-boat base on the French coast, is your target. You know all about this one. It's the one you all say is the toughest in Europe. You've been there before. You know the story from here, Shorty, you tell it.

"I've had to clean my guns and check the turret before we take off," Shorty Gordon begins.

"When the ship gets off the ground I climb into the turret from the inside. On

ILLUSTRATED BY
CAPTAIN RAYMOND CREEKMORE

AIR FORCE, June, 1943

take-offs and landings I'm not in the turret because if we crash-landed the turret would be smashed. First thing I do is snap on the power switch, then get the guns charged. I have to charge them before we get too high because pulling back those bolts with both hands leaves me a tired guy at high altitude. When we get to the Channel I test the guns by firing a few rounds.

"The guns are pointed downward when I first climb in, but over enemy territory they are forward and low and I'm searching for enemy aircraft. If I'm in the lead ship I search to the front. Otherwise, I search to the front and side of the formation on which we're flying. If I'm in the rear element I concentrate against a rear attack.

"When the turret revolves gunners usually lose all sense of direction because they can't see the bottom of the plane unless the guns are pointing straight to the front or straight to the rear. Some of us veteran

It takes a tough guy like Shorty Gordon to handle the toughest gun position in a bomber over Europe.

the sight plate I can't see to aim. I watch closely now for enemy fighters because this is a favorite time to attack.

"If I see one coming from behind the bomb bay doors I shoot right through them. It's either do that or let him get us. There is a catch on the turret that keeps the guns from swinging up and firing into the props or wings, although there have been times when our bullets have accidentally struck other planes in the formation. Luckily they caused little damage.

"When I hear 'bombs away' from the bombardier, I try to watch them falling so I can report to the Intelligence officer where they hit. On this St. Nazaire raid I watched

that hid the formation of Forts flying ahead. It was like a big thundercloud, thick enough to walk on. We all agreed later that it was the largest and most accurate barrage ever thrown up at the Forts over Europe. The barrage is a swell sight but it gets on my nerves. I could hear flak hitting the ship.

"I knew that if flak hit me while looking down I'd get it in the face, so I continued searching forward. About that time I heard someone on the interphone yell 'I'm hit,' and then another say 'I'm hit.' I thought this time we were going down in France. Everyone seemed to be shot up badly so I waited for the order to bail out. This was one mission I was wearing my chute.

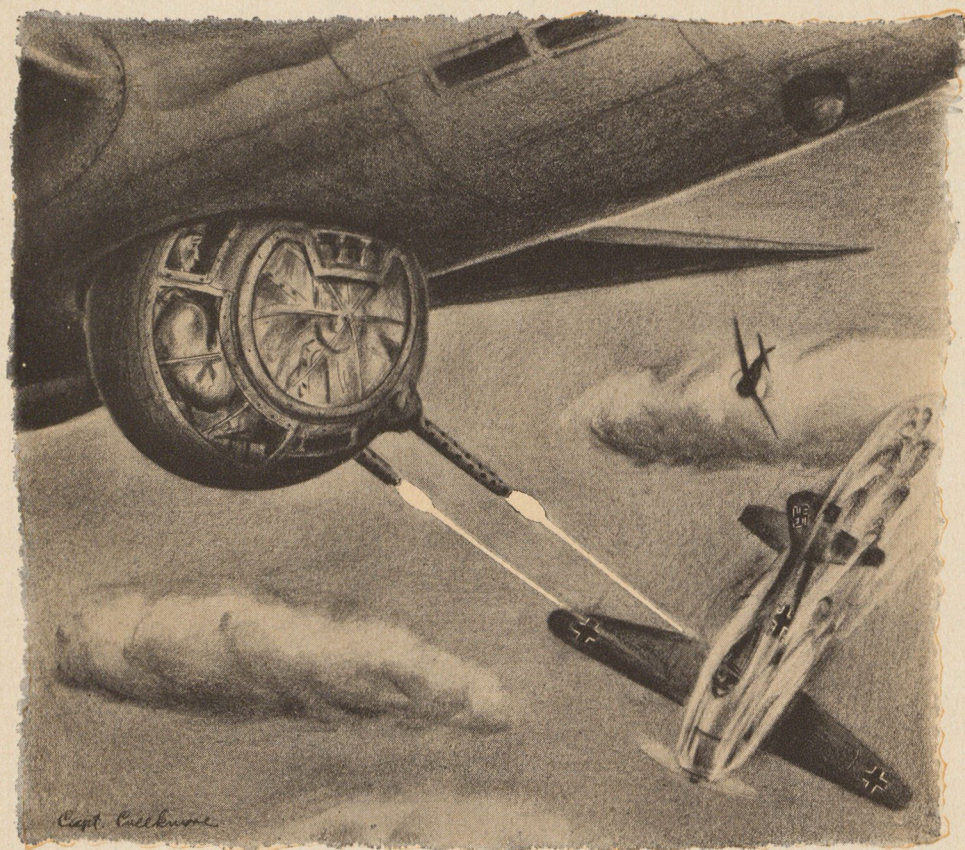
"I was still searching forward when I saw the Number 1 engine on fire. I stepped on the interphone button but it was dead. I wanted to tell my pilot, Lieutenant Cunningham, about it, and wondered if I shouldn't get up into the ship and tell him. It was burning on the under side and he couldn't see it. I decided to stick in the turret because there might be more fighters coming. Finally Lieutenant Cunningham saw the fire through a flak hole in the wing and pulled the fire extinguisher on that engine. That stopped the fire, but the prop was windmilling out of control and I was afraid it would tear off the engine.

"We were over water on the way back when I suddenly remembered that I didn't have my Mae West and was trying to figure out how I could get ashore after hitting the water. But then I heard someone say that enemy fighters were approaching from 11 o'clock. I ran my guns to that position, nearly straight ahead, and waited. I could hear bullets hit our ship but I couldn't see the fighters. That's one of the worst things that can happen—hearing other gunners firing but not being able to help them.

"I heard the bombardier calling out two enemy aircraft coming in low from 3 o'clock. I turned and saw them and gave the first one a long burst at 800 yards. They were Focke-Wulf 190s and one was following the other. I hit the first one. Both of them saw my tracers and started to break off. Then I gave the first one another good burst at about 600 yards and saw my tracers going into his engine. He caught fire and went into a dive. I followed him for about 5,000 feet, then started searching for the other fighter. One of the waist gunners saw the first FW splash in the water. It was easy to see because we were only at 15,000 feet. The other fighter apparently turned back.

"My feet started to hurt pretty bad when we got down to 10,000 feet because they began thawing out. I had to take off my helmet and tear at my hair to keep from feeling the pain. My electric shoes hadn't been working. That was the fifth time I froze my feet. When I search forward my feet and legs are pointing ahead, and that makes the blood run back out of them."

FOR two weeks after that mission Shorty's feet bothered him. It wasn't their feeling numb and going to sleep all the time that worried him; he was just afraid they



gunners can tell just what position our turret is in by the screaming of the wind. It makes different noises as the gun barrels turn in different angles. It increases in volume when the guns are pointing forward and decreases as they swing to the rear.

"As we approach the target I have to hold one hand over an earphone to be sure of hearing the others calling out the direction of attacks by enemy fighters. The wind up there is pretty bad. Besides being way below zero it makes so much noise that when my guns are firing all I can hear is 'put, put, put,' and the clicking of the bolts as they go back and forth.

"When the bomb doors open I point the guns down to keep off any oil or dirt that might fly out of the bomb bay. If oil covers

"He caught fire and went into a dive. One of the gunners saw him splash into the water."

our bombs go down until I lost them. You can't follow them all the way down when you're flying at 25,000 feet, but I estimated their direction and the time they should hit. Other bombs were hitting in the water near the target. Then I saw our first one in the water short of the target. The next one was closer, the third hit the corner of the target and the other two went right into the middle of it. There was a hell of an explosion and we found out later that we made a direct hit on a torpedo storage shed.

"There was so much flak as we approached the target that all I could see ahead was the barrage over the target, a great black cloud

wouldn't let him go up again in that condition. That fear of being left behind is one of Shorty's continual worries and it has been ever since his crew was broken up in the States just before the air echelon flew to England.

Shorty had to come over by boat. That boat ride mortified him—the best gunner in the group having to travel by boat. Back at Muroc he had been telling the boys in the barracks that he was going to be in the “Big Push,” and a boat ride was an inglorious start to Shorty's personal invasion of Europe.

But Shorty was in a new crew before the group went out on its first mission. And he had happy hunting for a while. But the fifth time “Cunningham's Coffin” thundered back from the Continent it was in a state of salvage even before it landed. Normally, a crew waits until its Fortress is replaced. But Shorty couldn't wait.

He started bumming rides on other B-17s. Any old Fort would do, and if the ball turret weren't open for him, why, he'd take the tail gun. Yes sir, any old gun position would do. Even a waist gun. And if no position were open, Shorty would try to sell some other gunner the idea of letting him take his place.

FROM “Cunningham's Coffin” Shorty went to the famous “Boom Town.” Then to “Little Joe,” and then the “Sunrise Serenader,” the Fort that came home from the second raid on Germany with one wing dangling from a direct hit by a 20 mm. explosive shell in the main spar. Shorty was scared that time. He might have been tired, too . . .

He had returned to the station from a 48-hour pass on the afternoon before the raid. He had had little sleep. He went to his ship, spent two hours cleaning his guns, and was about to hit his bunk when the engineering officer called for him. A super-charger needed changing on one of the Forts, and Shorty was the only man small enough to climb inside the wing and crawl out to the engine and do the job.

Shorty worked most of the night inside the wing of that B-17. In there between the spars, compressed, cold. But working. He was finished at 0400 o'clock. Just enough time for breakfast. Then the briefing.

He was tail gunner on that trip and his guns froze up over the North Sea on the way in. That was the day the mercury at 22,000 feet was 45 below. That was the time he took off his electric gloves to work on his guns. The waist gunners could see Shorty back in the tail, bent over his frozen fifties, but they couldn't see what the metal was doing to his hands. Every time the moist side surfaces of his fingers touched the barrels, skin was welded to steel. And when Shorty pulled his hands away, the steel didn't rip an inch.

“I won't be able to use these guns, Lieutenant,” Shorty called over the interphone. “But I'll sit back here and tell the boys where the fighters are coming from.”

That day Shorty became a broadcaster.

He gave a play-by-play description of

the longest battle the Forts ever had over Europe. He had no sooner announced his broadcasting intentions when . . .

WHAM! It was a concentrated attack by FW-190s, ME-109s, 110s, 210s and even JU-88s. In they came and Shorty was on the air, warming to his job like a professional when the horses are heading for the wire. He was slightly excited at the time, he admitted later. In fact, he became unintelligible in spots and the other gunners couldn't quite follow his dazzling description of the 75-minute battle up there in the cold blue sky between the Forts and the Luftwaffe. They tried to tell him to get the hell off the air but his interphone switch was locked in position, the fight was just beginning, and Shorty was already heading for the wire.

Shorty saw everything that day. He saw things happen that had never happened before. He saw a Fortress drop out of formation with four Focke-Wulfs after it. The Fort took violent evasive action. It swung up and over, into a complete barrel roll. Fighters do that; not Fortresses. It took Shorty several minutes to get his voice down to a scream and describe it.

A few minutes later an FW collided with a Fortress head-on.

“The Focke-Wulf was starting to roll over and go into the usual dive away from our formation when his wing hit the wing of a ship in the element below us,” Shorty recalls. “The impact cut the wing off the fighter and knocked the wing off the Fortress just past its Number 4 engine. The Fort started into a circle, then went into a tight spin. It broke in two right at the middle and the ball turret went spinning down looking like a baby's rattle. Then the wreckage exploded.”

Returning across the North Sea, Shorty's ship had dropped back to protect a Fort limping along on three engines when a Focke-Wulf landed the cannon shell that nearly tore off the wing. They got the fighter that did it, and they eventually landed safely although the “Sunrise Serenader” was such a mess it couldn't be taxied off the runway.

Some of the things that Shorty does are not good examples for prospective gunners. They're not meant to be. Shorty at times is a horrible example. But most of the time is a horribly good one. And everyone loves him for it. He's the one big factor in Squadron morale, with all his worrying about going on missions, and his extra-curricular activities. . . .

IT was after that eventful raid on Germany that other gunners down in the tin Nissen hut paused between deals to ask Shorty if the “Big Push” finally was on. They had waited months to hear it, and were so amused when Shorty said “yes”, it was an easy moment for him to finger out the card he needed for 21.

Shorty never is lucky at cards although he gives them all the charm he can muster. Even his “Salt Mine” doesn't help very much. A gunner's “Salt Mine”—in Shorty's

squadron at least—is any special article that brings luck to his cards. Shorty's once was a dilapidated, dirty old mechanic's cap with long strings that hung down in his face. This eyesore was what he wore to bring luck at Black Jack. But he found he couldn't rely on it. It lost him too much money. So now the tattered cap has been replaced by a new Salt Mine, a cat that hangs around the hut in the evenings. With the cat on his lap Shorty seems to do better, although even the new Salt Mine gets kicked out of the place occasionally.

THE other gunners view Shorty as a combination comic strip—Katzenjammer kid one minute, a Superman the next. They tell of the time their squadron commander inspected the barracks, walking right past a bed with blankets neatly drawn up and looking like any other bed—except for a slight hump in the center 5 feet 2 inches long. That's one of the Gordon tricks.

On the dance floor, Shorty's number fours can burn more timber than a forest fire. At one of the squadron dances he entered the jitterbug contest. His partner, a WAAF, couldn't stand the pace and gave up after the first thirty minutes, but Shorty was just getting his second wind. He went on jitterbugging by himself to win first prize. It turned out to be a fancy toilet kit.

Shorty has a girl, too. Two inches shorter than he is. And he wants to get married. Shorty has known her for three months now and would have married her before this but didn't want to “just jump into something”. Army regulations here say you can't marry until you have officially stated your intentions, then waited two months. Shorty thinks he'll file his intentions any time now so those two months will be up at the same time he has completed 25 combat missions and can go off operations.

Shorty had a time convincing his fiancée's parents that he was not an ordinary Yank, the type about whom they had heard stories.

“But I began playing darts with her old man, drank 10 quarts of his beer and we got along fine,” Shorty explained. “And her mother wept when she heard I was going out on combat.”

Combat is the one thing he wouldn't be without. He'll take a good fight any time he can get it, and the best ones always are those above 20,000 feet where you're matching bullets with men who fly behind black-and-white crosses. They're grudge and blood fights because every man up there has had friends who never came back. Shorty is no exception. He hates their guts. He came face to face with a Jerry once. . . .

It was on the Romilly raid. An aircraft repair depot at Romilly-sur-Seine was the target.

Shorty nearly didn't make it. He couldn't get one of his guns together and the pilot was standing there beside him saying he was afraid they wouldn't be able to go if all the guns weren't functioning. But Shorty pleaded.

“Now, Lieutenant,” he argued as he sweated over the

(Continued on Page 38)

HIGH LEVEL JUMPING

Free fall, oxygen equipment, loss of consciousness, and other factors in parachuting from altitude.

and only about fifteen seconds at 40,000 feet.

Obviously, then, he will reach sufficiently dense air in time to avoid ill results from the 30,000-foot level with open chute, but not from much greater altitudes.

Fortunately, with the raising of aircraft ceilings, experimental engineers are devising equipment to take care of personnel at higher altitudes not only while they are in aircraft but when they are forced in emergencies to bail out.

A small oxygen cylinder—known as the bail-out bottle—has been designed to be carried in the pockets or strapped to the legs of high-altitude flyers. Oxygen is breathed through a pipe-stem. An eight-minute supply is available—sufficient to permit safe descent from any altitude in an open parachute without loss of consciousness.

EVEN the use of the bail-out bottle has its disadvantages, however, not the least of which is the necessity for the removal of the oxygen mask in order to place the bottle pipe-stem between the teeth. The protection from the extreme cold afforded by the mask is thus lost and the flyer's face is exposed to possible freezing during descent through the upper atmosphere. There are other shortcomings, but the bail-out bottle represents a decided step toward the solution of the problem.

In multiplace aircraft, such as a bomber, the walk-around bottle as well as the bail-out bottle is usually (Continued on Page 33)

The following article was compiled from information furnished by the Office of the Air Surgeon, at Headquarters, and the Materiel Center, at Wright Field.—ED.

ONE of the Air Forces' oldest "auxiliary" fraternities—older than the Short-Snorters, the Burma Roadsters and other "Orders" of the day—is the Caterpillar Club.

Its membership, somewhat exclusive in the days when planes still drew curious glances skyward, has mounted by leaps and bounds since the exigencies of war have forced more and more airmen to hit the silk.

There was a time when the average initiate into the club underwent a routine induction somewhat as follows: Something went wrong with the ship in flight. The pilot carressed his chute, muttered a prayer, bailed out, pulled the rip cord, hit the ground, sighed with relief. He was in.

This procedure still prevails, perhaps in the majority of cases, but nowadays a prospective Caterpillar must face other factors.

For instance, there's that tendency in this war to leave yourself open to a little target practice when you are so unfortunate as to be forced to abandon your plane.

In such cases, the boys who have any desire to enjoy their membership in the Caterpillar Club have learned to keep their hands off the rip cord until the last minute in order to make themselves a more elusive bullseye.

Another important element affecting parachute escape has been the development of high-altitude flying.

Many things happen to an airplane flying at high altitudes in wartime which compel the flyer to abandon his ship. Fire, a crumpled wing, or severe damage by enemy gunfire may cause an immediate necessity for bailing out, without allowing time for diving the plane to lower altitudes. Frequently, any attempt to lose altitude before abandon-

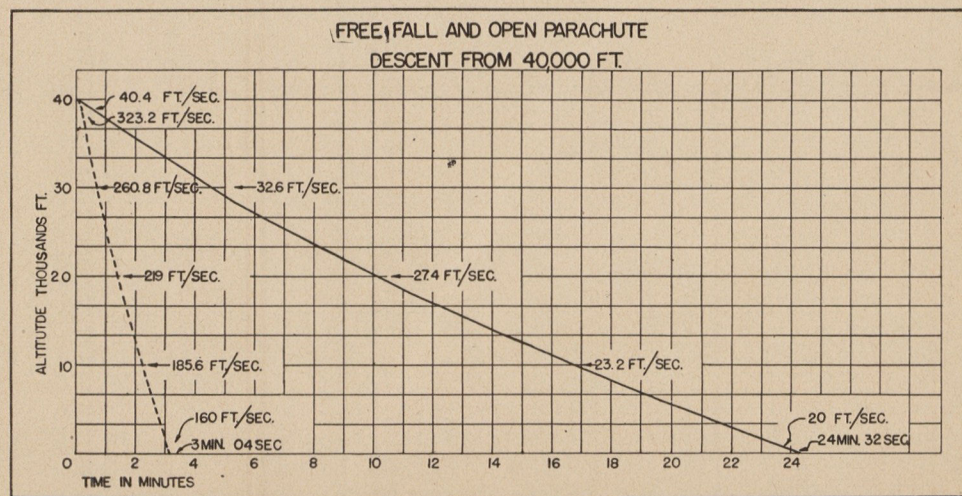
ing a plane will result in structural collapse, complete loss of control and an added difficulty of escape.

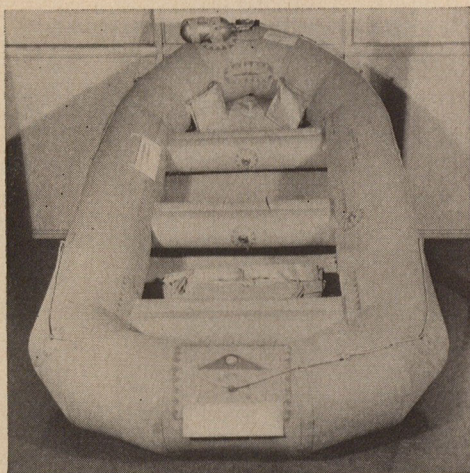
From an altitude of 30,000 feet a flyer can open his parachute immediately without experiencing loss of consciousness or any other extremely ill effects during descent. But a bail-out without oxygen equipment much above this level, or without resort to other safeguards, result in more than a few unpleasanties.

By way of background, the average rate of fall at 30,000 feet with open chute is 32.6 feet per second; at 20,000 feet, 27.4 feet per second; at 10,000 feet, 23.2 feet per second, and at ground level, 20 feet per second. The rate of fall increases comparably to 40.4 feet per second at 40,000 feet.

However, without emergency oxygen equipment, an airman bailing out will have useful periods of consciousness of from one to one and a half minutes at 30,000 feet, about thirty to forty seconds at 35,000 feet,

This figure shows the comparative rates of "free fall" and descent by parachute from an altitude of 40,000 feet.





The seven-man E-2 life raft pictured above has been adopted by the Army Air Forces for use on big planes.

Seven-Man Life Raft

In the collegiate Ford there was always room for one more and now a new life raft offers room for at least two more than usual with official adoption by the AAF of the E-2 model, a seven-man raft which is now standard equipment for our big planes.

Also ready and approved is an improved version of the five-man life raft, the A-3, just like the E-2 in every respect except size, for use with the Army's current production planes.

When the rafts were redesigned last year, increased comfort was the primary objective. This has been achieved in the E-2 and A-3. But you can't limit the number of occupants in an emergency so if it is necessary for twelve men to board a seven-man raft, it will hold them but with a consequent decrease in personal comfort.

Both of the new models come from the Equipment Laboratory at Wright Field and are equipped with more and better accessories.

Believed by AAF experts to be the finest raft of its kind, the E-2 has a 2,500 pound capacity and weighs 106 pounds with complete equipment. It fits into a carrying case 20 inches in diameter and 36 inches long. Both new models are made of a rubberized fabric that is more effective than the old rubber bladders and requires much less rubber. When inflated the E-2 is twelve feet long and five feet eight inches wide. By means of a compartment-type inflation device located in the bow of the boat, the raft can be inflated in from twenty to thirty seconds.

Horizontal instead of vertical bulkheads have been built into the new models. Here's what this means:

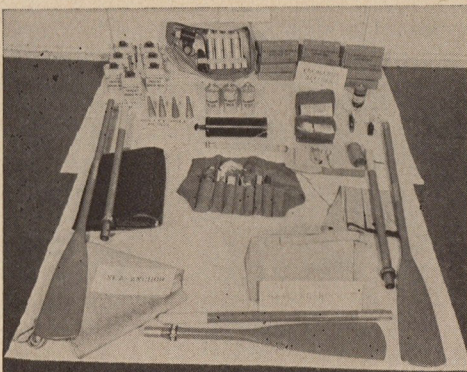
The chief disadvantage of the vertical

bulkhead was that when one side of the supporting tube was punctured by gunfire from a strafing enemy craft or by the attack of a shark the entire side collapsed, dropping the occupants of the raft into the water with only the one remaining side-tube to cling to for support.

Horizontal bulkheads are a definite improvement. With either the top or bottom of the supporting tube punctured, the remaining top or bottom side can adequately keep the raft afloat and upright. So long as the entire raft is not completely riddled it will retain its boat shape and buoyancy.

The five-man raft (A-3) is a 1,000 pound capacity raft. Like the E-2 it is made of rubberized fabric, contains horizontal bulkheads, lowered seats, more room, a mast and sail for improved navigation. It is 110 inches long and 60 inches wide, weighs 93 pounds with complete accessories, and can be rolled into a bundle 18 by 36 inches when deflated. Its accessories are the same as for the E-2.

The radio transmitter described in AIR FORCE (April) is standard equipment for both models.



The accessories shown above are standard equipment for the E-2 and A-3 life rafts.

These multi-place life rafts have almost enough accessories to open a general store. In addition to the radio transmitter, the following are standard equipment at time of writing on both the E-2 and A-3 models: hand pump with hose to maintain inflation of raft, repair kit, 75 pound test cotton cord for utility use and to lash accessories to raft, sea anchor, pyrotechnic pistol and five distress signals, emergency drinking water, a yellowish green sea marker dye to color water around raft to attract rescuers, type "K" rations, floating type flashlight, scout knife, police whistle to signal in fog, first aid kit, emergency fishing kit, paulin for use as sail, another paulin for catching rain water or for use as a signal, shade or camouflage, oars, bailing bucket, bullet-hole plugs, combination compass and match container.

—Wright Field.



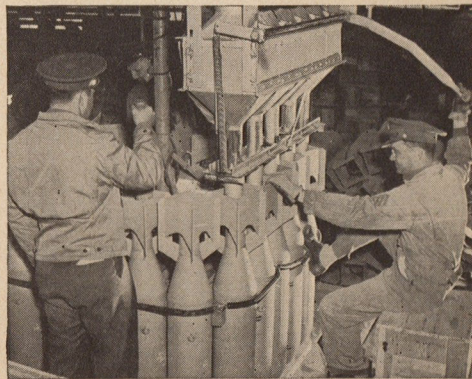
P-38 Ladder

A light, portable ladder which is attached to the stirrup of a P-38 to facilitate workers in going up on the planes is the design of Orval W. Meth (above), aircraft electrician in the engineering shops at the Sacramento Air Depot's McClellan Field, California.

Bomb Bottler

Five at a time, 100-pound practice bombs are each filled with 90 pounds of hot, dry sand and made ready for the powder charge by a "bomb bottling" machine (below) developed at the San Angelo, Texas, Army Air Field. The machine does the work of 10 three-man teams of soldiers releasing them for more skilled aviation work or combat duty.

Resembling a giant soda pop bottling machine, the "bomb bottler" is preparing thousands of practice bombs daily for bom-



★ ★ ★ ★ ★ ★ ★ ★ ★ ★

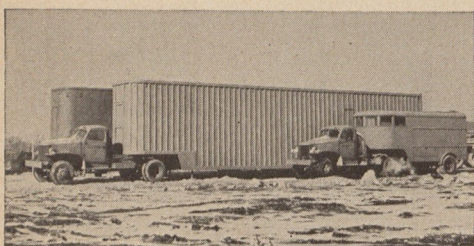
bardier cadets. Developed by aviation ordnance engineers, the loading machine accomplishes the first in a series of steps which prepare a 100-pound practice bomb, made up of 90 pounds of sand, five pounds of spotting powder and five pounds of shell and fins. Loaded with sand and powder charge it is for all practice purposes identical to the 100-pound bombs used in combat.

The job of the bomb-loading machine is to fill the practice "eggs" with the precise amount of clean, dry sand so that each will weigh the same. Accuracy in this operation is mandatory since wind resistance and trajectory of the falling missile may be altered by a slight variation in weight.

At the bomb plant siding carloads of bank-run sand are dumped. The sand then moves along an endless belt conveyor to a hopper and on into a revolving horizontal cylinder where it is cooked under several thousand degrees of heat until the last drop of moisture is gone. The sand then goes to a four-ton hopper to be screened of each stick or stone which might alter the weight of the bomb load.

Beneath the hopper is the "bomb bottler" which fills five bombs at one pull of the lever. A turntable affair with four sides, the machine fills one set while others are being readied, capped and unloaded.

An ordnance inspector checks each bomb, sends back those which need correction. A five-pound capsule of spotting powder is then inserted and the bomb is ready for the flight line.—**Public Relations Office, San Angelo Army Air Field, Texas.**



Glider Trailers

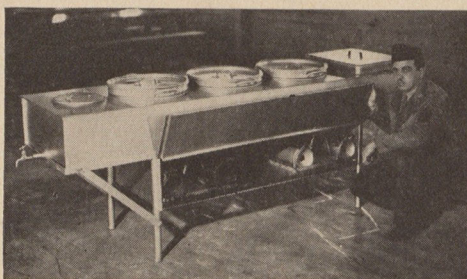
Huge trailers for the ground transportation of gliders are being used at Wright Field on an experimental basis. The trailers, which loaded can be hauled by a one and one-half ton tractor, were developed by the Glider Unit under the direction of Colonel F. R. Dent and are designed to transport either wings or fuselages. Two trailers can carry one complete glider. Originally of all metal construction, later models are of wood. In the picture above: left, the newer all-wood type; center, the all-metal, and right, a glider repair shop truck.—**Wright Field.**

AIR FORCE, June, 1943

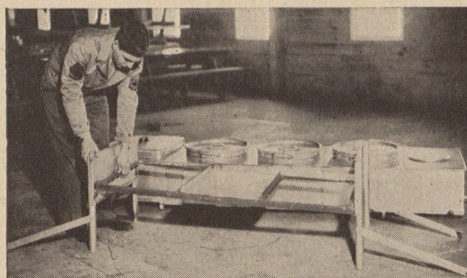
Portable Steam Table

A portable steam table suitable for field duty is the handiwork of Technical Sergeant Lauren N. Elkins, a mess sergeant at the Rome Air Depot, New York. Approximately 300 men can be fed keeping the food hot for an indefinite period.

It utilizes two gas units from army field ranges and has a 15-gallon coffee unit, with a convenient spigot. Food can be heated by placing it from the can into the steam table and letting the steam do the work. In combat it can also be employed to sterilize water. The center space between the gas units gives room for two tool kits.



Technical Sergeant Elkins and steam table. Below, dismantled for shipping.

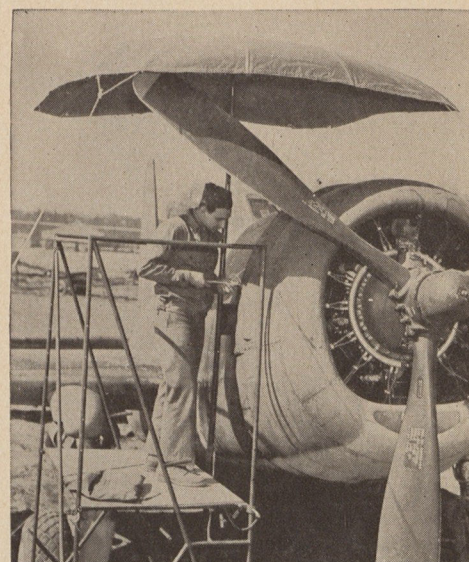


The steam table can be dismantled for shipping in 28 seconds. It fits into a box which can be converted into two tables and two benches. One table and the benches form the officers mess, the other is utilized as a cook's work table.

Turns Tables on Turnbuckles

A thin piece of spring steel one-half inch wide and five inches long which may eliminate the necessity of adjusting turnbuckles on control cables of aircraft is the contribution of Master Sergeant Stanley Billet of Minter Field.

Turnbuckles are now checked every 100 hours because should they become loose a slack would develop in the control cables. But with Master Sergeant Billet's gadget—a spring steel lock plate and fastener pin which turned the cable-loosening forces against each other—the turnbuckle is held permanently in place.—**Public Relations Office, Minter Field, California.**



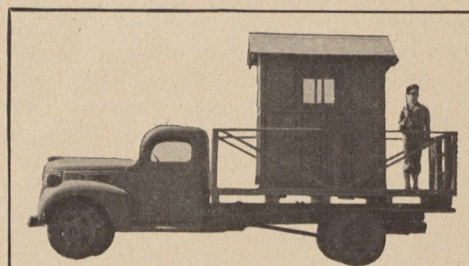
Umbrellas For Mechanics

Maintenance crews in desert and tropical areas will soon carry their own beach umbrellas. The sun shades, however, are not designed for languorous tropical lounging but rather to protect Army Air Forces mechs from the burning and exhaustive rays of the desert sun, enabling them to work longer and more efficiently.

Two types of umbrellas have been developed by the Miscellaneous Equipment Laboratory at Wright Field. One can be attached to the portable adjustable maintenance stand. The other has a standard with a spike which can be driven into the ground; heavy cord fastened to the plane helps support the umbrella.

The umbrellas not only aid the crews but also serve to shade aircraft and parts which frequently need cooling after exposure to the sun's rays.—**Wright Field.**

(Technique Continued)



Portable Sentry Box

Adapting one and a half ton Dodge chassis to specific purposes is a feature of the Automotive Department under Major William V. Garretson at the Newark Army Air Base. Shown above is a portable regulation sentry box on a platform completely surrounded with a safety railing. The sentry has excellent visibility from this elevated post.—**Captain Arthur J. Lonergan, Newark Army Air Base, New Jersey.**

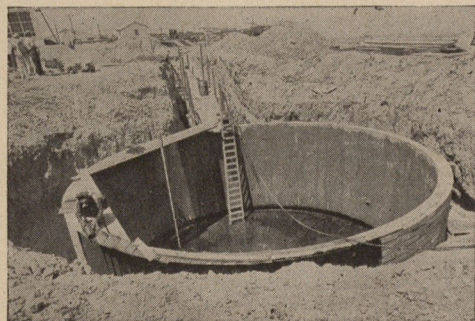


Concrete Gas Tanks

A new gasoline storage tank constructed almost entirely of concrete at Lowry Field, Colorado, seems to answer the need for more gas storage facilities and the conservation of vital steel.

Six months of experimental operation has demonstrated that concrete tanks can do the job as well as steel and just as cheaply.

The project, conceived and carried out by Major Karl Weinand, Area Engineer, required only a ton of steel and it was used only for concrete re-inforcement. The tank measures 30 feet in diameter and 12 in depth and has a capacity of 50,000 gallons of 100 octane gasoline.



Gasoline concrete storage tank is shown above in early stages of construction.

The danger of leaks caused by cracks in the settling concrete was eliminated by specifying double walls separated by a water jacket. The inner wall is eight inches thick, the outer wall 12 inches, and they are separated by a five inch space filled with water. Should the inner wall spring a leak the water pressure would prevent gasoline from escaping. To complete the leak-proofing the floor is laminated and consists of 12 inches of concrete, a heavy layer of mastic and then eight more inches of concrete.

The inside walls were treated with carbon dioxide to remove any free lime that might have remained in the pores, thus eliminating the only known possibility of chemical reaction between the walls and the gasoline. Regular checks have substantiated Major Weinand's belief that the concrete would not disintegrate or break down in any way from prolonged contact with the highly volatile fuel.

The tank is equipped with a mechanical system which utilizes a pair of coupled, synchronized pumps, one handling water and the other gasoline, commonly called the Aqua System. As gasoline is pumped out of the top of the tank, water is pumped in at the bottom so that the tank is always full of liquid and there is no opportunity for explosive fumes to form in the dome. When gas is pumped into the tank the procedure is reversed.

As the water level rises and the gas

supply becomes low, a pair of Clayton No. 124 automatic float valves, hydraulically controlled, shuts off both pumps while there is still 18 inches of gasoline in the tank. Thus, no water can be pumped into the trucks which service the planes.

Operation of the tank is carried out from a small control house where pumps and switches are located. The installation uses Wayne Model 569 priming and air eliminating pumps powered by five-horsepower explosion-proof, three-phase electric motors capable of delivering 200 gallons per minute. All electrical connections and switches are spark-proof and electric light bulbs are equipped with vapor locks out of respect to the extremely high volatility of aviation gasoline. The whole installation is now operated by personnel of the 59th Sub-Depot at Lowry Field.—**Captain Robert W. Ray, 59th Sub-Depot, Lowry Field, Colorado.**

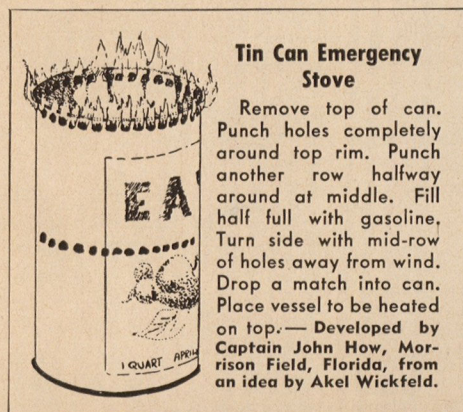
Two New Protractors

Two time-saving protractors for measuring the degrees of "travel" of ailerons, flaps, elevators, trim tabs and rudders have been perfected by H. L. Blakley, 29th Sub-Depot aircraft inspector, and put to practical use at the Enid Army Flying School, Oklahoma.

The protractors not only speed alignment of movable parts but eliminate errors in calculation.

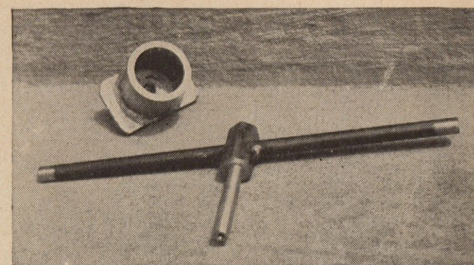
Formerly the required "travel" of ailerons, flaps, elevators and trim tabs was measured by means of a comparatively complicated protractor and an ordinary ruler which did not offer direct readings and could not be used on the underside of moving parts. With the Blakley protractor, direct readings can be taken either erect or upside down. It is produced at low cost at the Sub-Depot shops and it is now possible to supply each mechanic with his own instrument.

His other protractor computes the "travel" of rudders. Constructed entirely of plywood it also can be produced at low cost.—**29th Sub-Depot, Enid, Oklahoma.**



Tin Can Emergency Stove

Remove top of can. Punch holes completely around top rim. Punch another row halfway around at middle. Fill half full with gasoline. Turn side with mid-row of holes away from wind. Drop a match into can. Place vessel to be heated on top.—**Developed by Captain John How, Morrison Field, Florida, from an idea by Akel Wickfeld.**



Keeping Hot Pilots Hot

A simple device contrived by Staff Sergeant Frank E. Sugg at Hendricks Field, Florida, has cut untold hours from the maintenance time on B-17s. His invention of a glycol boiler "core puller" (above) has drawn immediate approval and is being manufactured for use at Hendricks.

When the B-17 on bombing missions flies for long periods at sub-zero altitudes it's important that the heating system for the cabin be operating properly. Briefly, the system works like this: glycol is pumped through a tubing circuit, gaining heat as it circulates about individual cores of three boiler units housed in an exhaust pipe and then passing on to the main heating outlet in the cabin. But glycol tends to carbonize on these cores causing proportionate loss of heat output until the system ultimately becomes ineffective. At this point the cores must come out and this is where Staff Sergeant Sugg's "core puller" comes in.

Previously extracting a core from its boiler meant removing the boiler first, actually the toughest part of the whole procedure. By the time all three cores had been taken out and cleaned and the boiler bolted back in place, a full day had usually slipped by.

Staff Sergeant Sugg, now a crew chief of a B-17 at Lockbourne Army Air Base, Ohio, subsequently fashioned a "glycol flushing system" which cleans the entire system and reduces to a great extent the chances for carbonization.—**Private Richard Eckman in the Hendricks Field Hi-Life.**

Synthetic Airplane Tires

After service-testing approximately 4,000 synthetic airplane tires, the Army Air Forces Materiel Center at Wright Field, Ohio, reports that synthetic tires are equal to, or may be superior to, natural rubber tires.

Natural rubber tires, however, are more adaptable to use in either extreme heat or cold; synthetic tires are not yet adaptable to both Arctic and tropical weather conditions. One synthetic process can make tires for use in extreme cold, while another process adapts tires for use in extreme heat. But as yet no process has been developed to make a synthetic tire suitable for both weather extremes.

—**Wright Field, Ohio.**

What's your AIR FORCE

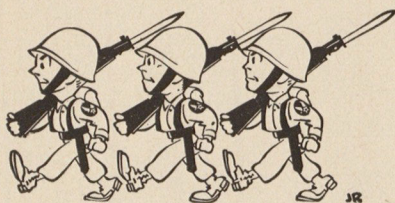


1. Anoxia is caused by

- a. High speeds
- b. Insufficiency of oxygen
- c. Rough weather
- d. Bad diet

2. An object can best be seen in very dim light by looking

- a. Directly at it
- b. To one side of it
- c. Steadily at it and blinking at four-second intervals
- d. Steadily at it and blinking at eight-second intervals



3. When marching at quick time, the length of the step should be

- a. 24 inches
- b. 30 inches
- c. 36 inches
- d. 40 inches

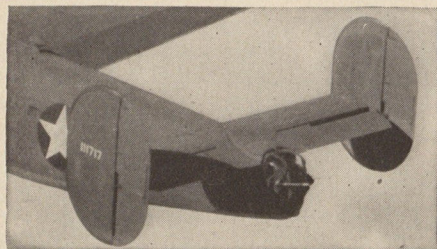
4. A Thunderhead is a

- a. Pilot who loses his temper easily
- b. "Dressing down" by the C.O.
- c. B-24
- d. Cloud formation

5. Randolph Field is now

- a. An induction center
- b. A preflight school
- c. A basic training school
- d. A central instructors' school

6. Identify this plane:



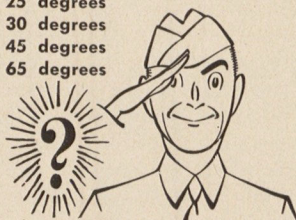
Grab the controls and take off on another flight with the Air Force Quiz of the month. Be light on the stick and watch out for a cross wind while landing. If your score is 100, you're perfect, as usual; 80 to 95, you're on the beam; 65 to 75, you're getting off course; 60 or below, you'd better check your bearings. Answers on Page 32.

7. Which of these words is inappropriate in this grouping?

- a. Altimeter
- b. Micrometer
- c. Bank indicator
- d. Tachometer

8. When rendering a hand salute properly, the forearm is inclined at an angle of

- a. 25 degrees
- b. 30 degrees
- c. 45 degrees
- d. 65 degrees



9. The props of an A-20 rotate in opposite directions

- a. True
- b. False

10. Arterial bleeding is indicated when the blood flow

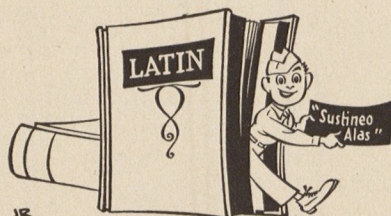
- a. Is a slow steady stream; dark red or purple
- b. Is oozing
- c. Spurts; bright red in color

11. In a P-39 Airacobra, the pilot sits

- a. In front of the engine
- b. Behind the engine
- c. Over the engine
- d. Beside the engine

12. The maximum amount of National Service Life Insurance available to an enlisted man is

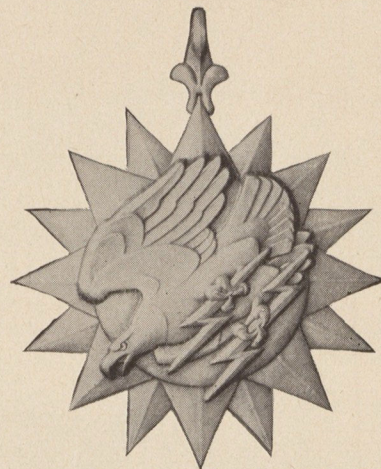
- a. \$3,000
- b. \$5,000
- c. \$10,000
- d. \$15,000



13. The translation of the Technical Training Command's motto, "Sustineo Alas", means

- a. I sustain maintenance standards
- b. I succeed in flight
- c. Sustained combat will win
- d. I sustain the wings

14. Identify this medal:

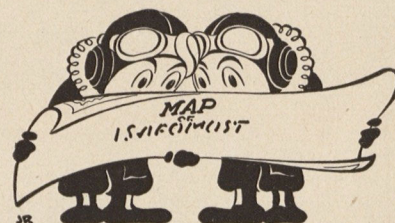


15. The official colors of the Army Air Forces are

- a. Cobalt blue piped with golden yellow
- b. Dark blue piped with light blue
- c. Dark blue piped with white
- d. Ultramarine blue piped with golden orange

16. The props of a P-38 rotate in the same direction

- a. True
- b. False



17. Your map is said to be "Oriented" when the north arrow on the map points

- a. To the Orient
- b. North on the ground
- c. In the direction you want to travel
- d. East to the rising sun

18. What do the following abbreviations stand for?

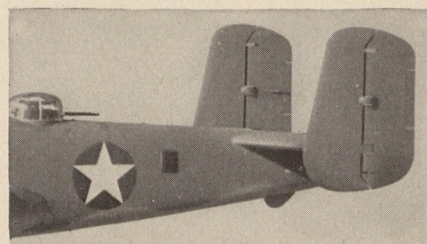
(one wrong is all wrong)

- a. CQ
- b. APO
- c. BOQ
- d. OCS

19. The word Azimuth is associated with a

- a. Rheostat
- b. Altimeter
- c. Compass
- d. Oxygen mask

20. Identify this plane:





A cargo plane awaits a takeoff at one of the outlying airports along the Trans-African run.

IF YOU'RE GOING TO MID-AFRICA-

By Major Stephen L. Gumpert

FLIGHT SURGEON



The author gets a close-up of an all-purpose camel near an East African air transport base.



Above are typical houseboys hired by officers on the Gold Coast; the music comes with the boy. Below is one of the marketplaces near a base "somewhere on the African front".



BEING a doctor, I did not have to overtax my imagination to visualize the possible obstacles to be encountered in central and western Africa—ranging from jungle animals and snakes to sleeping sickness, leprosy and malaria. However, 24 hours in which to make all necessary travel arrangements (allotments, power of attorney, car storage, and so forth) and assemble 77 pounds of useful articles does not leave much time for wondering what lay ahead.

Actually, of the 77 pounds of baggage about 25 pounds could well have been dispensed with. Such items as soap, shaving cream, cigarettes and tobacco can be purchased locally at U. S. Army PXs or in stores throughout west Africa and the Anglo-Egyptian Sudan. Post Exchanges are set up along this route and sell standard U. S. toilet articles, insignia, clothing, candy and tobacco and cigarettes (six cents a pack).

Clothing, with the possible exception of a woolen uniform and lined trench coat, should all be washable if you are headed for this territory. Laundry service is easy to obtain but dry-cleaning establishments are much more difficult to locate.

I had expected to find this area of Africa one huge jungle. As a matter of fact, with the exception of Liberia, most of the bases from West Africa to the Sudan are located in open, semi-arid country that greatly resembles parts of Texas. Rain usually comes in one or two relatively concentrated periods during the year, with little or no precipitation during the remainder of the time.

Much to my surprise my blouse, trench coat and other woollens did not mildew even in the most humid places on the coast. Whenever possible, however, I hung them out to air during the day, and at night kept them in a closet lighted by electricity.

The natives throughout this area are friendly and helpful. As traders they know how to drive a hard bargain; about one-half to one-third of the asking price is what they expect to obtain for their wares. As houseboys they are very loyal and hard-working, as long as their employer exercises patience and realizes their limitations.

It is the custom in most fixed camps and bases along the central African route for these natives to do most of the menial work—including laundry, cleaning of barracks

and other buildings, shining of insignia and the like. They have been brought up to respect the European and this respect should not be destroyed by over-familiarity, nor should the houseboys be spoiled by over-tipping. Local customs in this regard should be closely adhered to. Even though it might seem too trifling a sum, five shillings (about \$1) a week is the standard tip in many places.

Along the west coast, natives speak a pidgin English and have many curious expressions. Some of the more familiar ones are:

"Dash" for tip.

To do something "one time" means right away.

"Go softly" is go slowly.

"Make big breeze" means to go fast.

To do something "proper" means to do it correctly.

"Chop" refers to food and meals (breakfast, lunch or dinner).

NATIVES in the bush-country are hospitable and helpful to pilots forced down, although they sometimes find it hard to believe there actually are men flying in the planes. The natives seem to accept aircraft as man-made birds but it seldom occurs to them that their makers are aboard. I have known of cases, however, where natives braved intense flames to rescue occupants of crashed planes.

Camouflaged planes frequently are difficult to locate if they are forced down in this area. It is always a good idea to open a parachute near the plane so your presence can be detected more easily from the air.

Of the many varied and interesting (to the medical mind) tropical diseases present in this area, there are really only three outstanding ones from the viewpoint of a soldier along the route: (1) malaria, (2) diarrhea and dysentery, and (3) venereal diseases.

Needless to say, such ills as sleeping sickness, leprosy, yaws and the like do exist, but although they are present among the natives, they are a rarity among even those Europeans who have spent years in the area. So from a practical point of view, they do not constitute a hazard to white populations living segregated from the native towns.

But the "Big Three" represent another question. They are decidedly important

Tips on how to make friends and influence people—including yourself—in this section of the dark continent.

factors to be coped with and it is a matter of not only the command but also of each *individual* putting forth efforts along simple and straightforward lines of public health and sanitation. When these efforts are forthcoming, the health—and morale—of commands in these tropical countries is the equal of that any place. But the reverse holds true when lack of interest and negligence prevails. And remember, a soldier can be as thoroughly incapacitated by any of these illnesses as by the enemy's bullets.

A word in brief about these three hazards:

Malaria is transmitted by the female anopheles mosquito. Group control of this disease aims at destroying the breeding places of the mosquito, swamp puddles and all kinds of standing fresh and even brackish water. (Other mosquito-borne diseases such as yellow fever, dengue and filariasis are likewise eliminated at the same time.)

Screening of quarters, netting of beds and spraying of quarters with insecticide should then be done in an effort to wipe out those mosquitoes that have succeeded in breeding out. All these elaborate precautions can be a total waste of time; their success depends on the cooperation of each man in staying in screened quarters after dark as much as possible; seeing that his bed net is kept in good repair and is lowered into place at least two hours before sunset; wearing long-sleeved shirts, long trousers and mosquito boots (high top) after dark; using head nets, gloves and, if possible, chemical repellents when he must be out and standing still (guarding planes); staying out of native towns after dark where infected malaria mosquitoes, not to mention other health risks, abound.

Remember, more than one person has acquired malaria at the same time that he exposed himself to a venereal disease.

The possibility of developing a drug that will actually *prevent* development of malaria is being worked on and may prove one of the greatest possible aids toward opening the tropics to white man. At present, however, most medical men feel that neither quinine nor atabrine when taken regularly in prophylactic doses will prevent a person from developing the disease. These drugs, taken in this manner, very possibly act as "suppressives" and may actually suppress the symptoms while being taken. However, soon after the medicine is stopped the individual may come down with malaria which actually was acquired weeks before. When these drugs are taken for this purpose they should be used regularly as it is not only useless but may actually be dangerous to use them off and on.

It should be borne in mind that the type of malaria (aestivo-autumnal or malignant tertian) most prevalent throughout this area differs greatly from the type of malaria

(benign tertian) that occurs in the United States with its severe shaking chills, very high temperature and relatively sudden onset. The malignant tertian type is much more apt to have a quite subtle set of symptoms such as headache, backache, pains in the arms and legs, temperature about 101, and occasionally nausea and vomiting.

THESE symptoms, of course, may occur in a host of other diseases. The only positive proof possible is to find the parasite in a blood smear and see it under a microscope. And this is the way a diagnosis is made. Any person returning from Africa should be certain to tell his physician that he has been exposed to malaria if he is taken ill. Early treatment of this type of malaria is quickly effective. However, delay is very dangerous.

Diarrhea and dysentery in Africa—as in the United States—are transmitted mainly through food, water, milk, food handlers or by flies. At all our Army bases these factors are thoroughly controlled and supervised. But even in "nice" hotels and in the homes of civilians you might visit, the risk is present. Remember to avoid consuming salads or uncooked vegetables, untreated water, fresh milk and raw fruit, except thick-skinned fruit that can be peeled.

Venereal diseases are extremely prevalent throughout this area—and the hazards involved cannot be exaggerated. Enough said.

Various fungus diseases, such as athlete's foot and ringworm, as in all tropical countries, are easily contracted unless care is exercised. Daily showers, followed by thorough drying of the body especially between legs, toes, and so forth, is important. GI foot powder is a great help and should be used freely.

In certain of the drier areas, particularly the Sudan, extra salt should be taken daily in the form of salt tablets (or table salt, if tablets are not available). This helps make up the salt lost in profuse perspiration and prevents many of the milder symptoms caused by heat.

Amusements throughout this area are varied. Along the coast there is excellent swimming and in many places fairly good riding horses can be purchased for as little as \$10 apiece. When time permits, personnel may engage in hunting and fishing. Then, too, movies arrive about three times a week by plane from the States. Mail service has been good, letters usually requiring between seven and ten days to go or come.

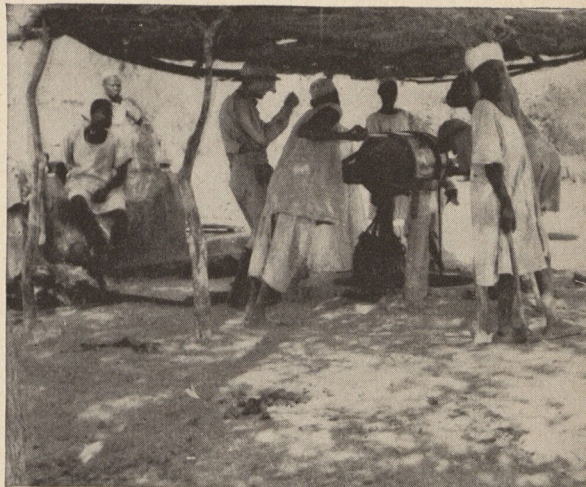
Most good times are self-made and the happiest individuals in the African tropics, as elsewhere, are those who put out the most work, and then make the most of their free time by following up their interests in sports and other recreations without fretting over things 10,000 miles away about which they can do little or nothing. ☆



These big fellows are part of a group on guard duty day and night at an African Airfield.

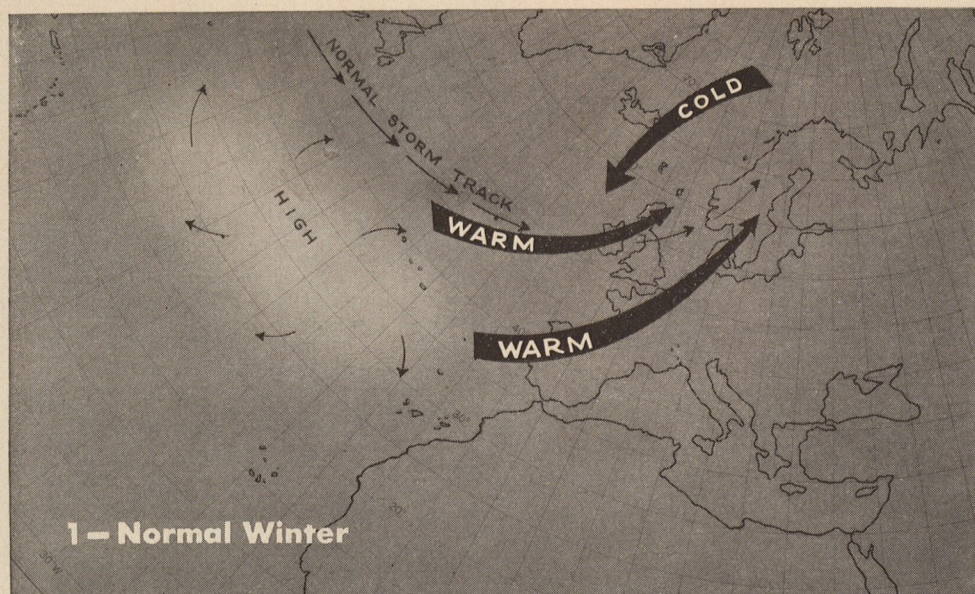


On the edge of an East African airfield appears this contrast in modes of transportation.

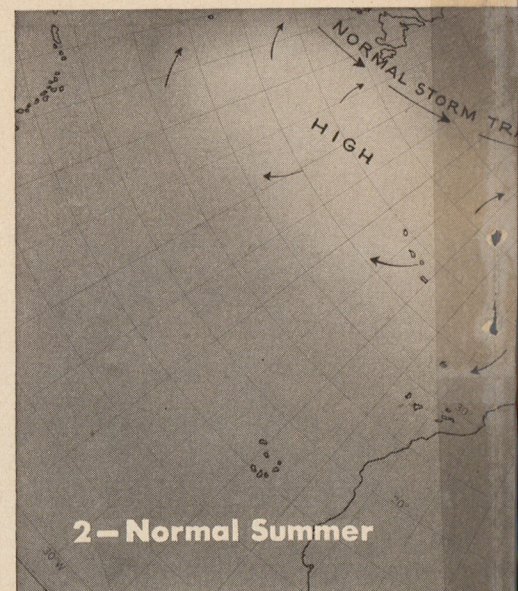


Never drink water from native wells. This one is within inches of ground level and is the repository of assorted filth. Below is the interior of a typical transport on the African run.





1—Normal Winter



2—Normal Summer

EUROPEAN Weather

By Major Joseph J. George

WEATHER INFORMATION SERVICE, HEADQUARTERS, ARMY AIR FORCES

SUMMER weather over England and Western Europe, bringing with it changes in aerial tactics, demands the studied attention of American airmen particularly since it differs a great deal from summer in the United States.

European weather is predominantly marine in origin and character. It moves onto the continent from the ocean without passing over any great mountain barriers—as it does on our own coasts—and thus is little transformed. Europe has lower average temperatures in summer, since the air flow is mainly from the north. Cold fronts are not followed simply by clear skies, as in most of America; passage of a cold front is generally pursued by broken cumulus clouds and showers. ☆

1 Normal winter air flow. Note that the average storm track lies directly over England.

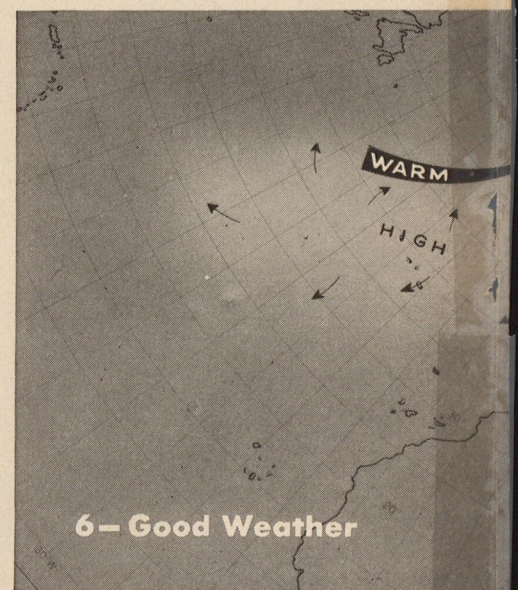
2 The average flow pattern during summer. The large "High" is called the "Azores High." Its eastern end moves north and south, and accordingly allows the storm track to do likewise. When the normal condition is present, as illustrated here, the storms move between England and Iceland with only the most vigorous fronts affecting southern England to a great extent. Occasionally the "High" axis shifts southward and allows storms to pass through the British Isles or the continent.

3 A typical summer weather situation which allows clear or nearly clear skies over most of England and the continent during the following 24 to 36 hours.

4 A bad weather situation. This pattern

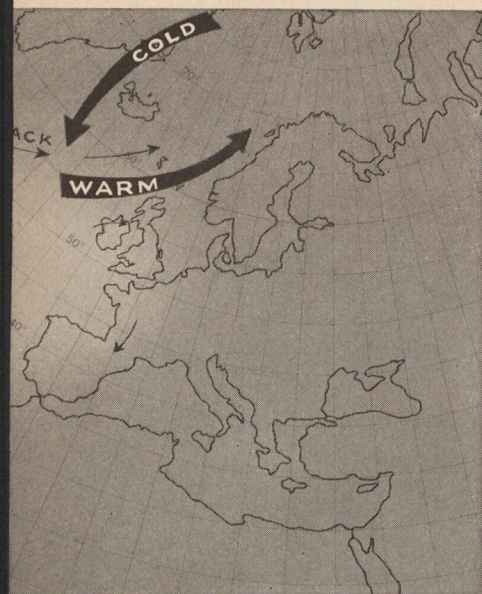


5—Broken-Cloud



6—Good Weather

Weather Charts by Technical

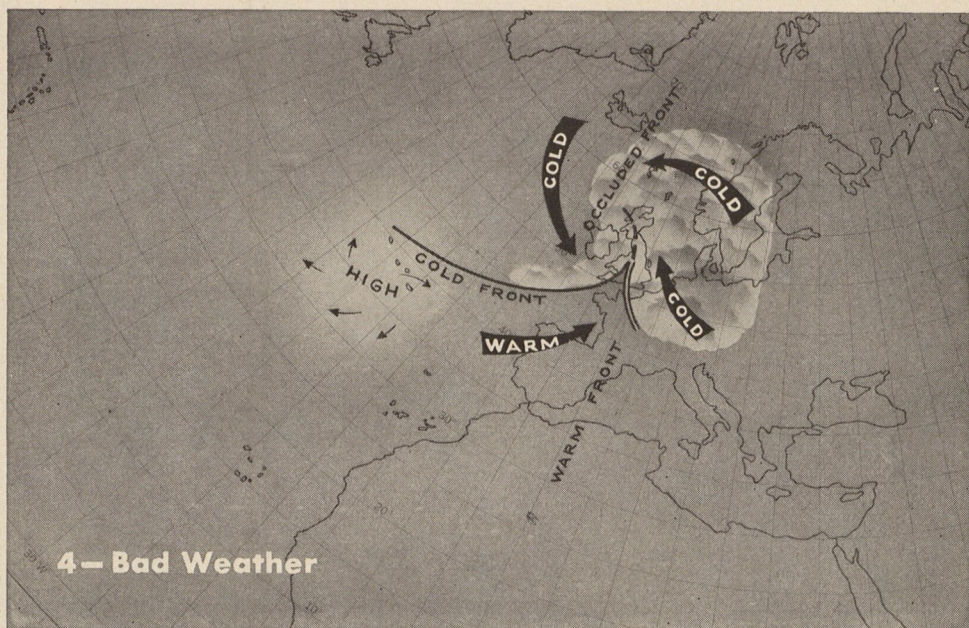


is generally unfavorable for flying. The thick low clouds and rain will persist over most of western Europe and England. Conditions will improve over England shortly after the cold front passes into the channel.

5 A situation which causes broken clouds over France and Germany with widely scattered thunderstorms especially in the mountains. Activity will diminish generally throughout the region as the front advances eastward.

6 A good flying weather type characterized by a northeast-southwest orientation of the Azores "High".

7 An old "Low" has stagnated over the North Sea. Weather conditions will improve very slowly over the continent and the Azores "High" usually extends eastward assuming northeast-southwest orientation of good weather.



Sergt. Ralston Crawford



ON THE LINE

**WHAT'S WRONG
WITH THIS PICTURE?**



It should be easy to find the mistakes pictured above. The errors stick out like a sore thumb.

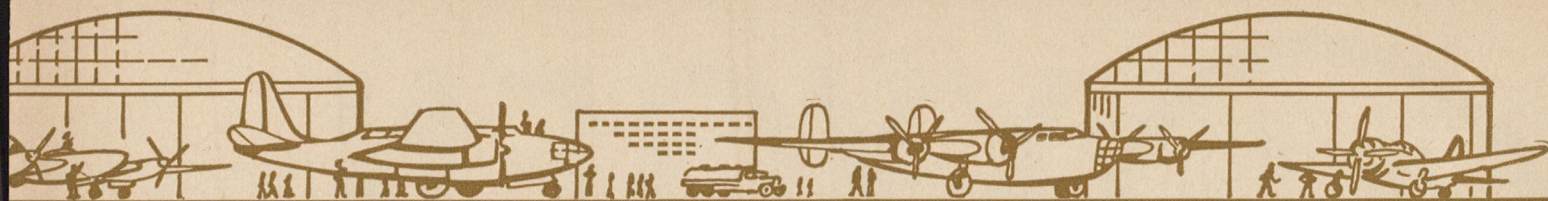
The boners in this photograph were suggested by Master Sergeant J. A. Bergin who also obliged by posing. He's the NCO holding the light. Others from left to right

are Staff Sergeants H. Piergallini and Harry C. Hartleben and Technical Sergeant E. T. Van Sickle. All four are members of Headquarters Squadron, Air Service Command Headquarters, Patterson Field, Ohio.

They cooperated to make this picture

knowing that safe and correct maintenance procedure can be mastered only by following Tech Orders and service manuals to the letter.

M/Sgt. Bergin picks nine mistakes in the picture. Can you find more? Answers on opposite page.



DID YOU KNOW ...

That we comb the fields far and wide to bring you timely hints and interesting facts on maintenance? This is your column, mechs, and we need your ideas and suggestions to keep it alive and snappy, so mail some in to the AIR FORCE Editorial Office, 101 Park Avenue, New York (17), New York. Especially would we like to get tips from you old timers ON THE LINE to pass along to the many, many younger ones. We promise to print as many as we have space for, giving full credit to contributors, unless you ask us not to. Your suggestions will help others.

This month's ON THE LINE maintenance items have come from men at various bases. Who's next?

PARACHUTES ...

You can't exercise too much care in handling parachutes properly. Throwing them from the fuselage to the ground, leaving them on asphalt, cement and surfaces already soaked with grease or tossing them carelessly into bins is asking for trouble. You or your buddies in the flying crews may have to use them some day. See T.O. 13-5-2 for details on handling of parachutes.

A GOOD MOTTO ...

One contributor points out that: A good mechanic is never careless—and a careless mechanic is never good.

BALL AND SOCKET JOINT BOLTS ...

Bolts in ball and socket joints of engine controls that become extremely loose cause excessive wear and creeping controls. Proper adjustment can best be made by disconnecting the linkage on either side of the joint assembly, and then adjusting to secure snug sliding fit of ball in its seat without binding at any position. The ball seats in these ball and socket joints are comparatively shallow and if the ball does not seat snugly, excessive wear of the parts will result. Reference: Par. 1, T.O. 01-1-80.

ON LOCKING CONTROLS ...

Neglecting to lock controls when leaving aircraft, causes serious damage to aircraft control surface, etc., because of exposure to high winds or propeller blasts from other airplanes. On airplanes having internal surface control locks, the locking devices should be engaged whenever both pilots' seats of dual control airplanes, or the pilot's seat of single control airplanes are unoccupied. On airplanes having external control locks, the locks should be installed at any time the airplane is left unattended. Reference: T.O. 01-1-29.

AIR FORCE, June, 1943

A monthly maintenance round-up prepared in collaboration with the Air Service Command and the Technical Inspection Division, Office of the Air Inspector.

SALVAGING ...

One of the many interesting maintenance stories to come out of the South Pacific is about the salvaging of four P-40s by the men of an AAF Service Squadron.

The P-40s had run out of gas and crash-landed on an out of the way, "hard to get to" island. The pilots were safe.

In order to salvage the valuable plane parts, so difficult to replace in remote areas of the South Pacific, a ramp lighter, a jeep and other supplies including machine guns were loaded on a small steamboat and the picked crew set out for the island.

There they found the planes on a jungle-covered 900-foot plateau almost directly off the beach. Natives, fascinated by their first sight of a truck of any kind, helped in the salvage work just to get a short ride in the jeep.

Two of the planes had crash-landed in good shape, but the other two were damaged severely. Wings, fuselages, motors, guns, radios and other parts were loaded on the jeep and carried to the beach.

There, during the high tide, the heavy parts were put on the steamer by the ramp lighter, while the light parts were carried



Be sure area under plane is clear before you open or close bomb doors!

Costly and lengthy repairs, both mechanical and physical, result from carelessness in this respect.

through the heavy seas in native outrigger canoes. The landing job took three days.

Hats off to a tough job—well done by the mechs of the Air Forces!

PROPELLER TIME EXTENSION ...

Did you know that the operating time on most propellers has been extended? See T.O. 03-20-5 revision dated April 2, 1943.

MISTAKES ON OPPOSITE PAGE

Reading from left to right

1. Wait a minute, get that jack clear of the wing before you try to push it down. Do you realize that if the oleo were to lose its pressure or the tire go down, the jack shaft—and your hands—would be shoved right through the wing skin? Reference: Common sense.

2. Hey, you up there on the nacelle, get your foot off the de-icer boot. It wasn't made to stand that kind of treatment. And are you responsible for that piece of cowling and the toolbox on the wing? Looks like they're digging into the de-icer boot, too. And how about that piece of cowling on the floor? Did it fall?

3. And say, buddy, we sure hope you aren't the same mech the camera caught smoking in "What's Wrong With This Picture?" in February.

4. Sergeant, you know better than to use that type of light; according to AAF Regulation 85-6 you should be using a vapor and explosion-proof lamp assembly.

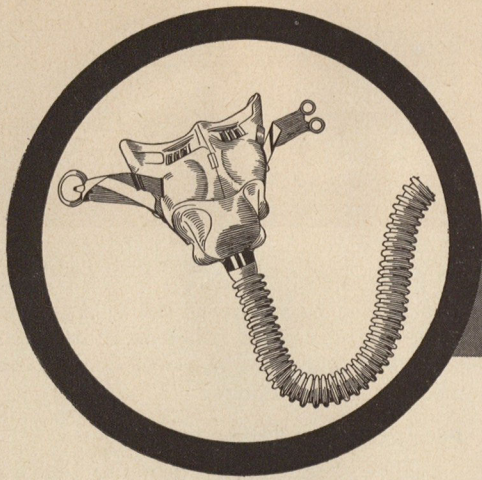
5. And what about that parachute? It's a double mistake. Common sense tells us that it is poor practice to let a chute lie on the floor in the dirt, oil and grease. And T.O. 13-5-2 explains that the main riser webs must never be wrapped around the pack and used as a carrier.

6. Don't use that oil cooler scoop or any other part of the airplane as a rag bin. Aside from the possibility of forgetting to remove the rags before take-off they are a definite fire hazard in the hangar. Reference: Common sense.

7. Never, never place cowling up there in the ring cowl. Besides bending the cowl if it falls, numerous other parts can be damaged or broken.

8. Is that step ladder broken? If it's not, open it up; if it is, get a good one. You are putting a severe strain on the propeller and showing very little consideration for your own safety. And by the way, where's your crew chief stand?

9. Last but not least, why not reel in the trailing antenna before someone hits his head on the fish or tears the wire loose?



OXYGEN IS YOUR LIFE !

By Brigadier General David N. W. Grant

THE AIR SURGEON

FAMOUS last words: "This is just a routine hop so you needn't check the oxygen cylinders. I won't need them."

This pilot's comment is about on a par for common sense with that of the anti-submarine patrol crewmen who insisted they had no reason to learn how to use oxygen equipment because they never flew over 100 feet. And so saying, they were transferred to combat only to discover they were to fly their first mission at 28,000 feet.

It happens every day.

You never know when you are going to need oxygen, so have your equipment ready at all times and on all missions, and *know how to use it*.

Not long ago two bombardiers died needlessly from want of oxygen—and they weren't in combat either. They were on a routine practice flight when they suddenly struck bad weather and had to "go upstairs." These officers did not know how to use a simple piece of equipment, one which, in a matter of seconds, became so important that it meant life or death to them. They are just as dead now as if they had been machine-gunned by the enemy.

Then there is the report of the "wise guy" who thought he knew all about oxygen equipment. But he borrowed a new type of mask from one of his fellow pilots one day and took off in his P-38. After no little difficulty he managed to get the mask on and turned the little red knob on the regulator, not noticing it was marked "emergency." You turned knobs on the old regulator, didn't you? His oxygen was exhausted at 30,000 feet, much to his surprise, and down he came for relief. How fast he came down no one will ever know for by the time he realized what was going on, he had to pull out so tightly his ship came apart all over the landscape. You're skeptical? All right, ask a certain officer in a photo-reconnaissance outfit who pulled the same stunt not many days later but lived to tell the tale. What he knows about oxygen *now* practically makes him an expert.

But that's learning the hard way.

The best scientific minds in the country have devised the best oxygen system in the world for the Army Air Forces. When used properly, it will insure an adequate oxygen

supply on flights as high as 40,000 feet. But remember, a piece of equipment is only as good as the man who uses it. Know your oxygen equipment. This means every combat crew member, commissioned and enlisted personnel alike.

The type of oxygen equipment now most widely used in operations is the so-called "demand" type. Unlike the older types in which oxygen came from the regulator at all times and the flow had to be increased with altitude, the demand type provides oxygen only when you inhale. When you exhale, the flow stops. Furthermore, the demand type does not need adjustment with altitude; it is automatic.

ON the side of the demand regulator is a little handle which controls the "Auto Mix." It has two positions, "On" and "Off." When the handle points to the "On" position, you get a mixture of oxygen and air. As you gain altitude, you get more oxygen and less air. This mixture is automatically controlled by the regulator. In the "Off" position you get only oxygen—but all you need. Unless otherwise instructed, use your regulator with the "Auto Mix On."

Now, that red knob marked "emergency". Use it only for that if the "demand" mech-

1. This is the new A-10 (Revised) oxygen mask, scheduled for widespread use among flying personnel by June 1. Like the A-10, it operates with the Demand Regulator but fits more snugly and is attached to the helmet.



anism fails or your mask leaks badly, *open the emergency knob*, but remember, you're then using your oxygen so rapidly your supply will soon be exhausted.

The demand mask must fit perfectly. It must not leak since the pressure changes that occur during breathing control the regulator. See that your mask is fitted for you and checked often by someone who *knows* how. This someone is your unit oxygen officer.

Oxygen officers are being assigned to each combat squadron to see that officers and men use and understand new oxygen equipment.

For many months, the Aero-Medical Laboratory at Wright Field has been developing new oxygen devices for AAF planes. These projects have provided greater flexibility, economy and dependability in oxygen equipment. They have made it possible for combat crews to move about freely during long flights with portable equipment, "walk-around bottles", and for fighter pilots to bail out from high altitudes with oxygen in a portable flask.

Research during the development of these devices has established the desirability of using oxygen at all altitudes from the ground up on night flights. This research has shown that night vision stays constant at all altitudes if oxygen is used, but that when it is not used, night vision drops approximately one-fifth at 5,000 feet and one-half at 15,000 feet.

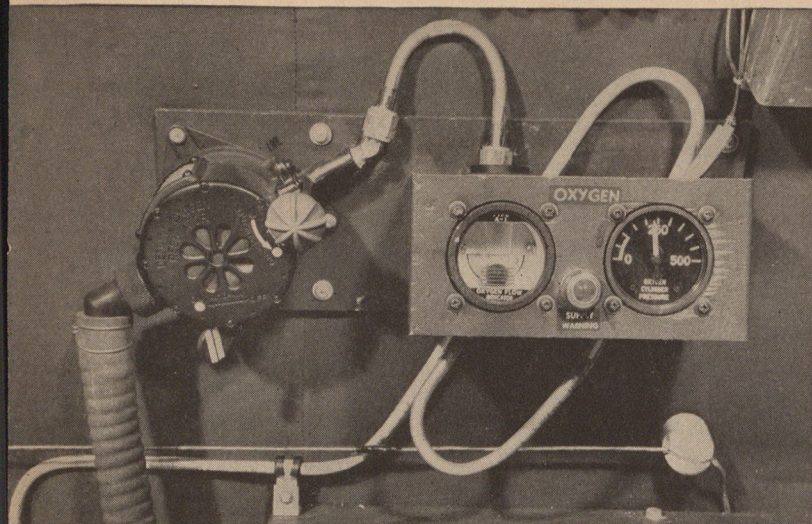
Other equipment developed includes a mobile oxygen generating plant, a dryer to remove excess moisture which could form ice in the oxygen system, and special vehicles which carry large master cylinders to fill up oxygen tanks in the planes.

These developments have added complexity to the oxygen systems. So special officers have been trained to show you how to handle your oxygen equipment skillfully and intelligently.

Take good care of your mask, too. Rubber is as difficult to get for their manufacture as it is for tires.

In addition to the oxygen officer, your flight surgeon is always ready and willing to advise you in any oxygen problems you may have. Check in with these officers and get checked out properly on oxygen equipment.

It may mean your life someday. ☆



2. This typical oxygen installation shows the Demand Oxygen Regulator, with auto-mix turned "ON", and the oxygen instrument panel, consisting of the A-1 type flow indicator, in which the bouncing ball shows the flow of oxygen with respiration, and the K-1 type pressure gauge to measure tank pressure.



4. Above is pilot in a multi-place plane equipped with A-10 Demand Oxygen Mask. Similar precautions must be exercised in avoiding leaks with the revised A-10 as with this mask in order to insure proper regulator operation.

USE OXYGEN INTELLIGENTLY

DO

Use oxygen above 10,000 feet on all flights.

Use oxygen from the ground up at night or on rapid ascents to high altitude.

Breathe normally.

Adjust your mask carefully and eliminate leaks before take-off.

Be thoroughly conversant with your oxygen equipment and the reasons for its use.

Report faulty function of oxygen equipment promptly.

Check your oxygen equipment before take-off and frequently during flight.

DO NOT

Do not fail to insure full cylinder pressure and an adequate supply of oxygen for your mission.

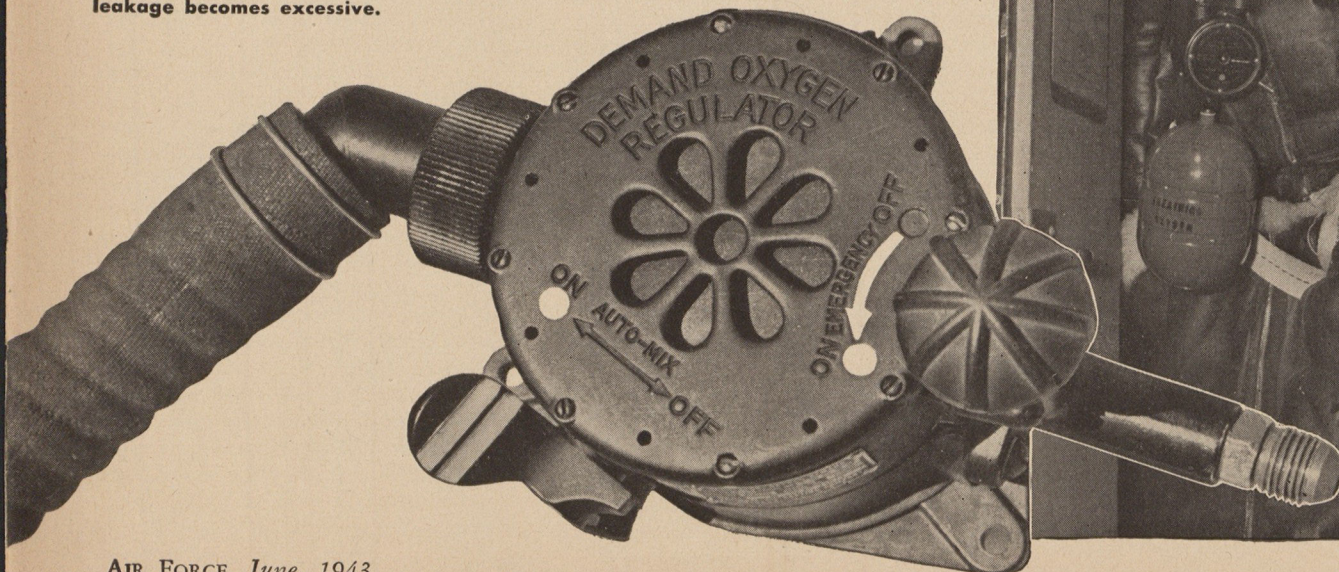
Do not fail to use your own fitted mask and necessary connecting tubing.

Do not leave your walk-around and bail-out oxygen bottles in your locker. You may need them.

Do not waste your oxygen supply by needlessly high flows.

Do not take liberties at high altitude by walking about the aircraft without portable oxygen bottles, or by failing to turn on the oxygen supply in time.

3. This close-up of the Demand Oxygen Regulator, used with both the A-10 and A-10-R masks, shows the auto-mix lever in the "ON" position. Here the regulator furnishes the proper mixture of air and oxygen on demand at all altitudes. Starting with little or no oxygen at sea level, the mixture becomes enriched until 100 percent oxygen is supplied at about 30,000 feet. If the auto-mix handle is placed on the "OFF" position, the regulator gives pure oxygen on breathing at all altitudes. The Emergency knob should be used only if the demand system fails to function or mask leakage becomes excessive.



5. This crew member displays good sense by using the portable oxygen unit, known as the walk-around bottle, while moving about in a plane at high altitude. The equipment is used with the A-10 mask and provides a 4- to 8-minute supply of oxygen, depending on the altitude and the activity of the user.



THE WAY TO EFFECTIVE TEACHING

By MAJOR LYMAN I. COLLINS

CHIEF, OPERATIONS SECTION, AAF TRAINING AIDS DIVISION

HIDDEN away in the squadrons over the country are thousands of good training ideas that never get out, and there are training officers everywhere who could and would use them if they had the chance.

This is a situation which implies both difficulty and promise. Individual initiative and independent achievement have been encouraged in the Army Air Forces from top to bottom. Both officers and enlisted men have responded. Now the need for coordination, the bringing together of the mass of developments, has become important. This is a function of the Training Aids Division. In an effort to see that what is known *anywhere* about training aids will be known *everywhere*, AFTAD liaison officers have been assigned to cover ten of the key AAF units in the United States.

As the Army Air Forces has grown, so has the number of instructors. And as combat conditions have become more varied, the problems of training have multiplied in number and complexity.

Teaching and learning come best when there is a union of patient, informed instructors, eager students, time and necessary equipment. Note the last two. At the moment time is precious and new equipment needs are just being discovered and developed. Emphasis must be on speed. Review and repetition are the luxuries of a more academic peacetime. What is taught must be absorbed immediately. Otherwise, the casualty lists grow longer.

UNQUESTIONABLY the lecture—the oral explanation—is not by itself the best teaching instrument. The man in front of a class must supplement his words with life and substance. He must find and use all the concrete aids possible. He must show what he talks about. He must demonstrate. He must have student participation. He must provide materials for out-of-class study.

What is needed and what is available for effective teaching?

1. Where the subject matter is static (the nomenclature of instruments, the items in a kit, the organization of a unit, etc.) posters and film strips are immediate helps in economizing the learning effort.

2. Where the subject matter is dynamic, where action and performance count, where attitudes are to be inculcated, as in "Learning How to Salute," "Removing the Engines from the C-46," "How to Fly the A-20," "Beyond the Line of Duty," or "Mr. Blabbermouth," moving pictures are invaluable in conveying the ideas, and in preserving the interest and attention of students.

3. Where basic facts and doctrine must be learned until awareness of them is instantaneous and where problems must be worked out, manuals, handbooks and study guides become the "bibles" of those eager for proficiency.

4. Where the acquisition of skills of all sorts is required, students have to "feel" and try out what must be known. It is a practical axiom that a man who is to know how to fly blind or shoot a machine gun has sooner or later to be put in a cockpit to go through the actual performance.

HOWEVER, the supply of ammunition and the number of planes are not inexhaustible. Even more important is the safety factor. When beginners are given highly complex machines to be put through difficult maneuvers there is always the possibility of injury. To eliminate such hazards as well as effect savings in material, synthetic training devices—substitutes which permit actual participation—have long since proved their worth. So rapid has been the development of these devices that one can now fly a 1,000-mile bombing mission, shoot enemy planes in transit, take pictures of enemy concentrations, compute the navigational data en route, and sight and bomb the objectives—without leaving the ground.

The Training Aids Division serves as a clearing-house of information and advice concerned with the acquiring and listing of all films, film strips, manuals and hand-

books, posters and synthetic devices now in use by the Army Air Forces.

AFTAD liaison officers have the task of telling directors of training what is available and seeing that devices and guides developed locally and used effectively are procured for others who could use them.

These liaison officers have authority to give immediate approval to the organization and use of all training aids developed within the Commands and Air Forces. Each officer is charged with responsibility of transmitting descriptions and, where practicable, copies of training aids developed within his jurisdiction to AFTAD Headquarters, and from there information is channeled to the other liaison officers, to be passed on to C.O.s in their respective unit areas. They are given advance notice of the publication of catalogues and lists and are kept advised of the progress on new projects. They know through AFTAD of the obsolescence of training materials. Working through their individual headquarters, they learn of pressing needs for certain kinds of equipment; then working with AFTAD they seek to expedite the effort to procure that equipment.

When special aids are needed on loan for short periods, they may often be obtained through AFTAD. On occasion, when charts, posters, models, manuals and the like, fail to reach those who need them most, liaison officers are available to assist in new requisitions.

To accomplish this job liaison officers from AFTAD are now on duty at the following headquarters:

Anti-submarine Command, New York City; Air Service Command, Patterson Field, Fairfield, Ohio; Flying Training Command, Fort Worth, Texas; Materiel Command, Wright Field, Dayton, Ohio; Technical Training Command, Knollwood Field, Southern Pines, North Carolina; 1st Air Force, Mitchel Field, Hempstead, Long Island, New York; 2nd Air Force, Ft. George Wright, Washington; 3rd Air Force, Tampa, Florida; 4th Air Force, San Francisco, California; Flight Control Command, Winston-Salem, North Carolina.



HE had chased that enemy plane all over the sky, had done very well with his rudder and stick. When the enemy streaked through his sight, he fired away. But his aim was bad. That blasted buck-tooth was making a monkey of him.

Coming out of a turn, the enemy momentarily flitted into the fighter's sight. The kid was thinking better now. He started to pull the triggers, hesitated, thought. He touched the controls lightly, and aimed not at where the enemy was, but at where he would be in a moment.

The guns chattered. There was a bright red flash in front. He had hit and the fight was over.

The kid looked a little sheepish as he stepped out of the cockpit and faced the captain. He knew what was coming.

"Well, you finally got him, son." Here was the dressing down. "Good thing you weren't in the sky for that performance. Pretty rotten, wasn't it?"

The kid admitted it. The captain softened.

"Don't let it worry you. I'm glad you don't have to get off the ground to do your practicing."

THE kid had been operating a standard synthetic contraption. Before he got the feel of the thing, he had made mistakes that might have cost his life if he hadn't had a ground buggy to practice in.

The entire combat situation was there—that is, everything except the hazard to life and aircraft. He had all the controls to operate while he manned his guns. The targets had flitted about in a make-believe sky, as elusive as enemy planes would have been in the real show.

This kind of training could go on twenty-four hours a day if necessary and at any place where there is a live wall socket to plug in the gadget.

AIR FORCE, June, 1943

SYNTHETIC COMBAT

By LIEUT. CHARLES S. KOPACZ

AAF TRAINING AIDS DIVISION



There isn't any argument about training of this sort. With synthetic devices the student learns by doing. They give him the feel, but they save lives and planes and guns and gasoline. Bad weather needn't keep novice pilots out of indoor cockpits.

These gadgets aren't for the fighter pilot alone.

A student gunner practices in a synthetic bomber turret for all the world like the real thing. He can be made to feel that the enemy is attacking from all directions. If the gunner's hands are skillful, the turret responds properly.

There are equally effective devices for the navigator, radio operator, flight engineer, bombardier, photographer, meteorologist and armorer. They range from simple, home-made gadgets to elaborate and expensive factory-produced devices.

The genius of the whole Army Air Forces has gone into the development of synthetic training devices. The results are found in jeep gunnery ranges, link gunnery trainers with BB guns, radar trainers, photographic trainers and navigation trainers, literally hundreds of contrivances remarkably like the things they simulate.

To coordinate the development, procurement and distribution of these devices, a Synthetic Training Section has been set up as part of the Training Aids Division. The first job of this section, obviously, was to find out what synthetic devices already were in use or in process of development. Every

activity of the Army Air Forces, the Canadian and British air forces, and the Navy were asked to report on their activities in the synthetic field. The replies brought a wealth of information.

The reports were classified and listed for use in a catalog for distribution throughout the Army Air Forces. To keep all AAF activities current on synthetic devices, supplements will be issued from time to time. Through this method, the Training Aids Division hopes to make each AAF unit's efforts available to every other unit.

INDEPENDENT initiative in developing synthetic training appliances is encouraged. In the Training Aids Division, the AAF inventor has an agency to which he can send his inquiries about whether a particular device is in existence, how to get one, or—if the project is still in development—the status to date.

Many times, adjoining fields have developed similar devices independently. It is the function of the AFTAD to prevent such duplications of effort, to make possible an effective pooling of energy and talent.

Every activity has its problems with synthetic devices. A function of the Training Aids Division is to disseminate generally the information on how these problems have been solved locally.

At one station, a link gunnery range officer observed recently that there was a high percentage of misses. Investigation disclosed that firing while skidding was the chief cause. His department tried in vain to foolproof the trainer. The problem was placed in the hands of experts and was solved immediately. They fixed the trainers so that the guns would not fire unless the turn-and-bank indicator ball was centered.

An AAF station needed large computers for classroom demonstration. The sub-depot built one, consuming valuable time needed on other tasks. Investigation would have shown that suitable computers were readily available commercially.

Often the solution of these problems is more difficult. It may require consulting the Experimental Laboratory, civilian scientists, the Signal Corps, the Navy Bureau of Aeronautics or the RAF. The Training Aids Division has the job of finding the answers.



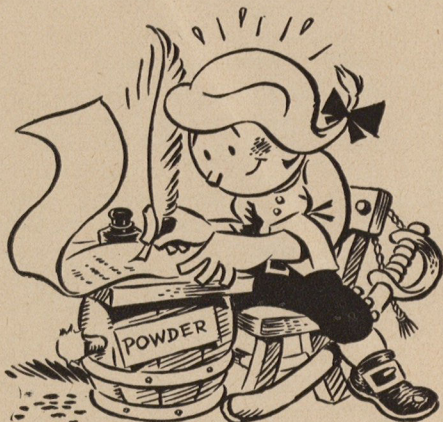
WHAT THEY'RE READING

By LIEUT. JAMES GOULD COZZENS

AAF TRAINING AIDS DIVISION

DURING the winter of 1778-79 the American Army's first piece of training literature was composed. The work was undertaken by a foremost authority on military training but he found it difficult because he did not know the English language. He did know French of sorts, so laboriously he put his ideas into French. Then it took three members of his staff, in turn, to convert the work into literal French and eventually into the "King's English." On March 29, 1779, *Regulations for the Order and Discipline of the Troops of the United States* was published by Act of Congress at Philadelphia. The author was Baron von Steuben.

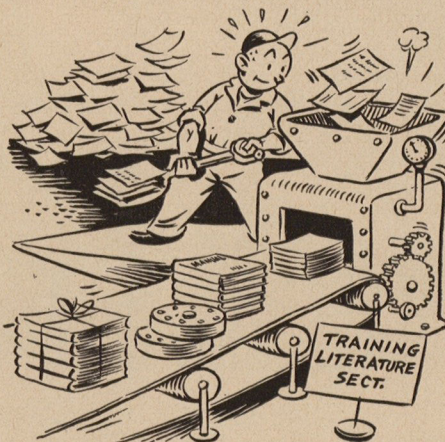
This new publication, called the military blue book, became the bible of the Continental Army. Part of it was a drill manual, but the Baron attempted a great deal more than merely to prescribe formations. He meant to cover, as well as it could be covered in a book, what strategists call technique. He explained specific military jobs. He also told the men how to be good soldiers and good officers.



That the Baron imagined his blue book, or any other book, was going to make the reader a finished soldier is unlikely. Finished soldiers are made by fighting, not by reading; but, then as now, there were important things that could be learned from a book by anyone of reasonable intelligence. In fact, some points could be better learned from a book, for the alternate instruction came in the form of bitter combat experience. The purpose of the Baron's blue book was to teach men their military jobs the easy way. That is still the purpose of training literature. Soldiers cannot go into combat with a field manual in one hand, but they

can go into combat with the manual lessons in their heads.

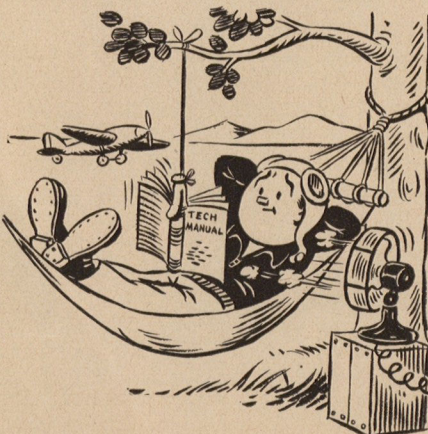
The Training Literature Section of the Training Aids Division supervises the production of training literature for the Army Air Forces. Its specific functions include, besides the actual writing of training litera-



ture, approving and coordinating the development, distribution and use of material from all sources, eliminating duplication of effort, reviewing and editing and acting as a clearing house and information center where all branches of the Air Forces can find out what literature is available.

The weapons of the Air Forces are complex and complicated, and miles of type and hills of paper are devoted strictly to technical instructions for using and caring for this equipment. This mass of technical material clears through AFTAD.

This also is true of manuals on the tactics and technique of air fighting, of air attack, of torpedo and incendiary bombing;



on flexible gunnery; on emergency procedures; on the duties of combat crew members, of officers in tactical squadrons and groups, in base operations, in air depots and service centers.

Making such manuals available presents problems. For one thing, any manual dealing with tactics deals with something that, in the Air Forces at least, is constantly changing. Yesterday's tactics are often ineffective today and perhaps suicidal tomorrow. Baron von Steuben's material might have had to be translated from the German in which he thought, to French, to English, but at any rate the points to be made did not change as fast as he wrote them down.

Not only does the content of a manual have to be authentic and properly prepared, but the treatment of this material must be considered. This depends largely on the type of manual being compiled. In the case of such subjects as Elementary Physics for Air Crews, or Mathematics for Bombardiers and Navigators, it is plain that no amount of art or artifice in presentation will teach physics or mathematics without effort on the student's part. A man who takes up either manual does so because he has to master its information before he can go on with his job.

On the other hand, such field manuals as a forthcoming one on Local Ground Defense of Airdromes can be made more interesting and even more instructive by profuse illustration. In a few instances—for example, a new Air Forces handbook on physical fitness—something approaching the painless technique of the comic strip will work. ☆

WHERE TO GO

Information on the availability of training films and film strips, aircraft recognition materials, synthetic training devices and training literature may be obtained from the Training Aids Division, Army Air Forces, No. 1 Park Avenue, New York, N. Y. (Formerly located in the Florida Bank Building, Orlando, Fla.—Ed.)

FLORIDA'S COMBAT THEATRE

(Continued from Page 9)

Ground crewmen at the same time will be learning to overcome problems they will be called upon to face in these same theatres. The AAFSAT training course lasts for one month. Then your cadre will return to its parent training Air Force, where the remaining personnel required to round out the new bombardment group will be assembled. Officers and men who have been to AAFSAT then will pass along to the rest of the group tactical combat pointers taught them in Florida, before departing for overseas duty.

This same procedure is followed by fighter, air support and air service cadres, all of whom get their own academic instruction, then join in framing demonstration missions.

To carry out both the instruction and tactical developments missions, each of AAFSAT's Departments operates as a normal tactical command with an academic section superimposed upon it. Let's take the Air Defense Department as an example.

The Fighter Command this Department represents is composed of the Orlando Air Defense Wing, with a Wing Headquarters, a Fighter Group, an Air Warning Battalion, two Night Fighter Squadrons and two Fighter Control Squadrons. This setup involves a standing personnel of approximately 3,000 officers and men, who operate some 125 tactical aircraft. In addition, the academic section consists of the necessary supervisory personnel, school troops and instructors.

A BRIEF breakdown of typical courses offered in the Air Defense Department will be of interest to personnel engaged in the several phases of fighter aviation training.

A course is given for communications officers and enlisted men in radio maintenance and the operation of radio equipment in fighter control squadrons. In another course, officers are instructed in controlling fighter aircraft in flight from the ground. This course covers controlled interception, both synthetic and actual, navigation, weather and identification of aircraft.

The Signal Corps handles courses for personnel trained in the Aircraft Warning Service. These include filtering information derived from radio locator points scattered throughout the AAFSAT theatre of operations, the inspection, operation and maintenance of special radio locator equipment, the recognition and reporting of aircraft by ground observers, and the theory and tactical employment of signal communication system as it pertains to A.W.S.

The Coast Artillery instructs Coast Artillery officers and men assigned to the Air Forces in the employment of searchlights and anti-aircraft artillery in a unified air defense system.

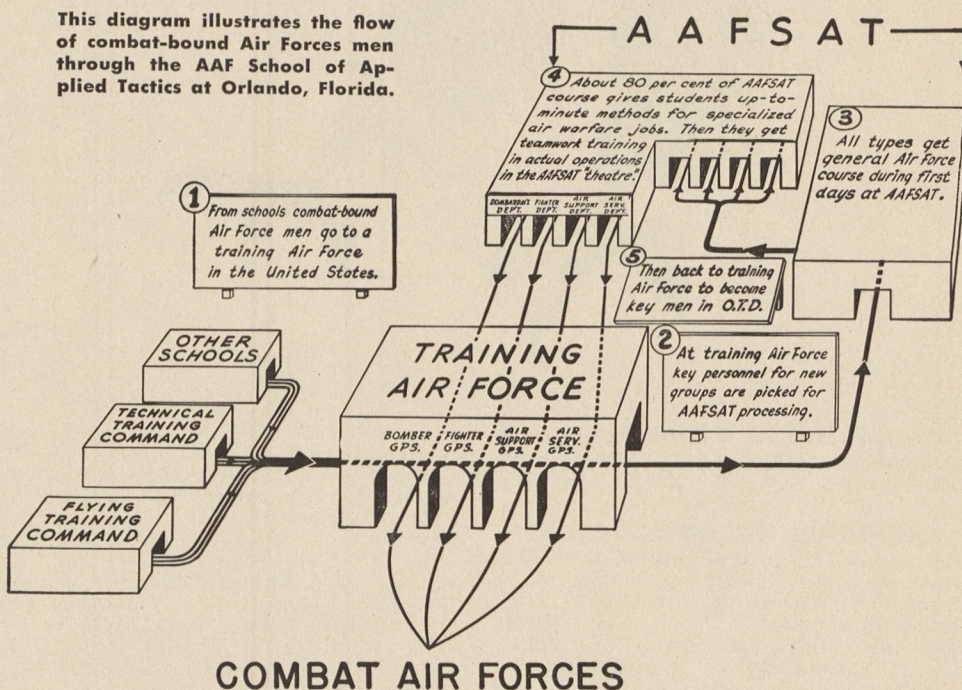
These courses, it may be noted, are in addition to the academic and tactical training of fighter pilots, and administrative and service personnel in fighter group cadres. Included in this part of the Air Defense Department's responsibility is the training, activation and commitment of night fighters.

An example of the tactical adaptation of academic courses may be found at the outlying bases of the Air Support Department.

At one airdrome specially equipped A-20s practice the employment of minimum altitude bombing tactics (sometimes called buzz-or skip-bombing), developing refinements of a technique employed so successfully in the Bismarck Sea engagement last March. Dive bombers at this same field blast targets in practicing dive-bombing techniques — some of them established in actual combat operation, others developed by instructors and students at this base.

SEVERAL miles away, at another airdrome, paratroops, glider troops and other airborne personnel work out under simulated battle conditions, dropping behind imagi-

This diagram illustrates the flow of combat-bound Air Forces men through the AAF School of Applied Tactics at Orlando, Florida.



nary lines and capturing an "enemy" base in the prosecution of a special field problem. From yet another base, planes take off for a sector and try to rout ground troops with tear gas. Other aircraft, ranging from liaison Cubs to the speedier P-39s and A-20s, are used in special observation problems.

Just as the bombardment and fighter personnel receive plenty of synthetic training before heading for outlying bases, Air Support students are given similar academic preparation by working out problems around sand tables supporting miniature villages and "enemy" terrain.

Aside from its vital role in academic instruction, the Air Service Department is charged with responsibility of supplying and maintaining active combat units in the AAFSAT theatre airdromes. Actively aiding in the supervision of this mission are specialists from the Quartermaster Corps, Signal, Medical, Ordnance, Chemical Warfare and Engineer Corps, who have been assigned to the Air Forces. They augment the

staff of Air Corps maintenance, technical supply and administrative personnel.

From the standpoint of organization, AAFSAT consists basically of four "directorates", an air staff and four Departments. Brigadier General Gordon P. Saville, former Director of Air Defense, Headquarters, Army Air Forces, is the Director of Tactical Development; Colonel H. W. Holden, the Director of School Activities; Colonel C. W. Lawrence, Director of Academic Training, and Colonel R. A. Day, Director of Operations and Facilities. Colonel Day also serves as Chief of the Air Staff.

Staff members are Major C. H. Ferguson, A-1, Lieutenant Colonel E. F. Luna, A-2, Colonel A. H. Foster, A-3, and Colonel C. C. Berry, A-4.

The Department heads, who also are commanding officers of the corresponding Commands in the field, are Assistant Commandants of AAFSAT. They are Colonel E. W.

Barnes, Air Defense, Colonel H. G. Montgomery, Jr., Bombardment, Colonel M. H. McKinnon, Air Support, and Colonel J. M. McCulloch, Air Service.

You officers and men who are assigned to AAFSAT for training should bear in mind that you are coming to a theatre of operations. You must be prepared to live and operate under circumstances similar to those experienced from day to day by Air Forces personnel already in combat theatres. Don't bring along your families, automobiles and household belongings. You will have little or no opportunity for personal, domestic interests, and you will only add to the already over-crowded living conditions in the Orlando civilian area.

It is important that you come to AAFSAT not merely with an open mind but prepared to ask questions and plenty of them. One question asked or one problem posed by you may result in the development of a technique which can be employed to good advantage against the enemy. ☆



A monthly record of
decorations awarded
to personnel of
the Army Air Forces.

CONGRESSIONAL MEDAL OF HONOR
BRIGADIER GENERAL Kenneth N. Walker*. **COLONEL** Demas Thurlow Crow* (Also Purple Heart*).

DISTINGUISHED SERVICE CROSS
MAJORS: John R. Alison, John W. Mitchell. **CAPTAINS:** William E. Dyess, Elbert O. Meals, Victor Emanuel Walton. **LIEUTENANT** Jack W. Hall. **TECHNICAL SERGEANT** Arthur G. Kelly*. **STAFF SERGEANTS:** Albert L. Catallo (Also Purple Heart), Doyle Kimmey*. **SERGEANT** Stanley A. McLeod*. **CORPORAL** William T. Anderson.

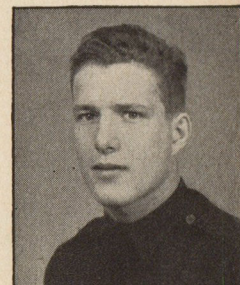
DISTINGUISHED SERVICE MEDAL
MAJOR GENERAL Robert Olds. **COLONELS:** Orrin L. Grover, Robert F. Tate.

Oak Leaf Cluster to Distinguished Service Medal
BRIGADIER GENERAL Alfred J. Lyon*.

SILVER STAR
COLONELS: Truman H. Landon (Also Distinguished Flying Cross), Homer L. Sanders. **LIEUTENANT COLONEL** Horace M. Wade. **MAJORS:** Alexander G. Evanoff, Elbert Helton (Also Purple Heart), George T. Ingram, William E. Kinney (Also Oak Leaf Cluster to Silver Star, Distinguished Flying Cross with Oak Leaf Cluster and Oak Leaf Cluster to Air Medal), Frank J. Puerta (Also Distinguished Flying Cross), Robert B. Sullivan (Also Distinguished Flying Cross and Air Medal with Oak Leaf Cluster), Jack A. Wilson. **CAPTAINS:** Richard H. Beck, William A. Brown, Walter Clark, Paul E. Cool, Charles W. Dunning*, Charles A. Fletcher, Jr., Robert J. Hughey, Mark T. Mooty, Christian Petri, Jr., Albert W. Schinz, Donald A. Simpson, Raymond A. Sloan, William Taggart. **LIEUTENANTS:** John D. Bailey, William L. Baker, Roy R. Bright, Charles S. * Posthumous

Brown, Charlie Bull, Frank C. Busbee, James W. Cain, Hans C. Christiansen* (Also Purple Heart*), Paul E. Dawson, Henry P. Elias*, Edgar G. Gammon, Jr., Elmer G. Ghram, Robert T. Golberg, Donald A. Graham, Samuel C. Grashio, Walter E. Gurley, Sanford W. Hickey, Michael Joseph Ingelido, Henry A. Keel, John D. Lombard, Jack C. McIntyre, Leonard P. Marks, Edward M. Nollmeyer, Bernard J. Oliver, Charles W. Peterson, Russel K. Pierce, Jr., Victor J. Poncik (With Oak Leaf Cluster), Gustav H. Radebaugh, Francis D. Riffin, William R. Rodgers, Alexander R. Salvatore, Walter T. Schmid, Vernon L. Scott, Philip K. Shriver, Henry M. Sparger, Roderick M. Stewart, Earl R. Stone, Jr., Richard C. Suehr, Euel A. Travis, Alden N. Wood, James L. Yelvington (Also Purple Heart). **MASTER SERGEANTS:** Thomas J. Crumley, William F. Myers. **TECHNICAL SERGEANTS:** Walter V. Cheek, James F. Shoup. **STAFF SERGEANTS:** Norman K. Frost (Also Purple Heart), William T. Jent, George A. Kielbasa (Also Purple Heart), John E. Lillback, John J. Meehan, Donald T. Ostlund (Also Purple Heart), Burnell Walker. **SERGEANTS:** Charlie Barnes, A. G. Blackwelder, Jr., Robert H. Burns (Also Distinguished Flying Cross), Calvin W. Croom, Lewis DeSimone (Also Distinguished Flying Cross), Perry Doty, Alfred H. Fawe, Ray D. Holcomb, Kenneth L. House, Daniel J. Keller, Henry P. McNeill, Jr., James W. Miller, Guy E. Reynolds, Thomas E. Ross*, John R. Walker. **CORPORALS:** Francis R. Neis, Albert F. Osterhaus, Robert D. Smith, George R. Zenz. **PRIVATE FIRST CLASS** Mack B. Anderson. **PRIVATES:** Wiley O. Cart, Otto Russell.

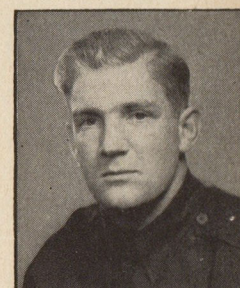
Oak Leaf Cluster to Silver Star
CAPTAINS: John Herbert Posten, Robert E. Thacker. **LIEUTENANTS:** Feaster A. Norwood, Adrian J. Sampeck, Edward R. Yerington. **TECHNICAL SERGEANT** Bernardino O. Tortora. **SERGEANTS:** Claude J. Fraley, Regis D. Weinfurther.



Lt. Wm. L. Baker



Col. C. B. Overacker, Jr.



Capt. Richard H. Beck

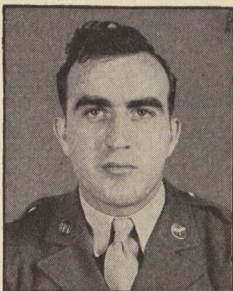


Lt. Elsie S. Ott

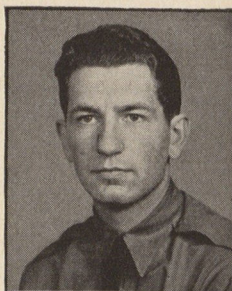
ROLL OF HONOR



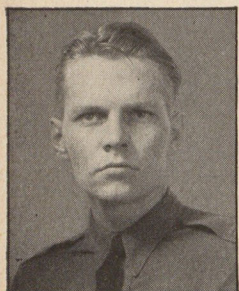
Col. Robert F. Tate



T/Sgt. J. Marling



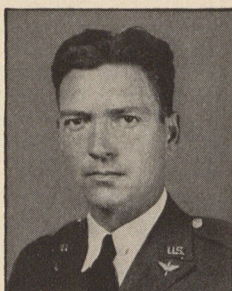
Capt. Warren A. Beth



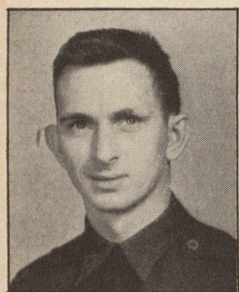
Lt. John D. Bailey



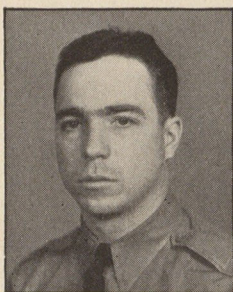
Maj. J. R. Alison



Lt. Col. J. W. Chapman, Jr.



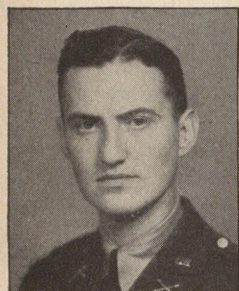
Lt. John J. Boll



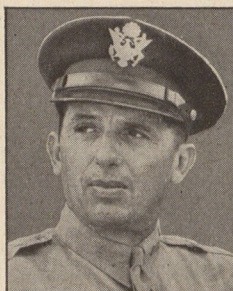
Maj. Frank L. Puerta



Sgt. W. T. Majewski



Capt. R. C. Lycan



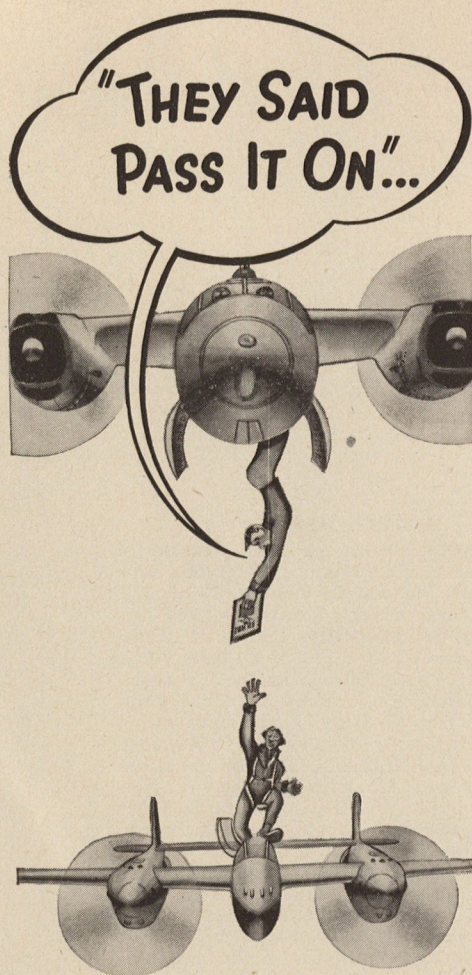
Maj. Gen. W. H. Hale



Sgt. Lee E. Nelson

PURPLE HEART

MAJOR GENERAL Willis H. Hale. **BRIGADIER GENERAL** Howard C. Davidson. **COLONELS:** William L. Boyd, William C. Farnum, William J. Flood, Clarence S. Thorpe, Leonard D. Weddington. **LIEUTENANT COLONELS:** Brooke E. Allen, James W. Chapman, Jr., Ted S. Faulkner (Also Distinguished Flying Cross), Ralph F. Friedenthal, Fernando Green, Andrew A. Meulenberg. **MAJORS:** William G. Benn, John E. Dougherty, Edward V. Hughes, William H. Monay, Raymond E. Nelson, John J. Thornhill (Also Distinguished Flying Cross and Air Medal), Francis C. Tremayne, Ralph M. Wanderer. **CAPTAINS:** Haley W. Aycock, Harvey C. Baus, Frank P. Bender, George A. Blakey, James G. Carroll, Gerald J. Crosson, Maurice W. Dale, Oliver C. Doan, William S. George, Jr., Max Goldman, Denver D. Gray, Ralph J. McBride (Also Air Medal), John C. Nissen (With Oak Leaf Cluster), George Rawlins. **LIEUTENANTS:** Bernard E. Anderson, Alfred Asch, Melvin E. Brown, Malcolm J. Brumwell*, Norman Bryant, Ralph C. Carey, Linden W. Cochran, James A. Daughtry (Also Air Medal), Clyde E. DeBaun, Harry E. Erickson, Fred N. Featherstone, Jr., John G. Foster, Richard Booth Gardner (Also Air Medal), Balfour C. Gibson, John G. Glover, John S. Greene, George L. Hasik, Herbert N. Hencell, Jr., Robert J. Hinson, Richard R. Hopper, Lyle G. Karnath, Aleron H. Larson, Virgil B. Lindsey, Daniel A. McColl, John B. McManus (Also Air Medal), Edgar V. Markley, Lee N. Minor, Jay E. Pietzsch*, John F. Twilley, Leland A. Walker, Jr., George A. Whiteman*, John P. Wright, Howard N. Young, Melvin D. Zajac. **MASTER SERGEANT** Stanley A. Hunt. **TECHNICAL SERGEANTS:** John T. Brogan, Victor J. Cozza, Donald E. Hiatt, Herman C. Reuss*, Garland B. Smith, Pete M. Vasilie. **STAFF SERGEANTS:** George M. Ashe, LeRoy H. Blonshine, Felix Bonnie*, John W. Carney, Harold C. Elyard, Paul V. Fellman*, Norman Holm (Also Air Medal), James A. Malone, Ralph E. Nau, Julius Schellenberg, William P. Wallen. **SERGEANTS:** Theodore L. Billen, Andrew H. Burnett, Harold O. Christiansen, John R. Conklin, Guy E. Dority, Patrick L. Finney*, Edward M. Jones, John B. Kraft, Edward B. Malinay (Also Oak Leaf Cluster to Silver Star), Robert H. Martin, Murel A. Murphy, Carson C. Richardson, Leland E. Taylor, Henry Wojciechowski (Also Air Medal), Rufus W. Youngblood. **TECHNICIAN FOURTH GRADE** Oliver T. Beyer. **CORPORALS:** Woodrow W. Brakefield, Richard A. Dickerson*, Edward P. Dwelis (Also Air Medal), Howard N. Lusk*, Walter B. Morrison, LaVerne J. Needham*, John M. Norquist, William H. Offutt*, Watson F. Parker, William F. Swain. **TECHNICIAN FIFTH GRADE** Clair E. Burt. **PRIVATES FIRST CLASS:** Raymond A. Chamberland, Eugene B. Denison, William C. Dryman, George F. Howard*, Sherman Levine, Richard E. Livingston*, Durward A. Meadows*, Sam C. Peticolas, Thomas E. Schofield, Ralph S. Smith, Johnnie F. Specht, Jerome J. Szematowicz*. **PRIVATES:** Manfred C. Anderson*, Gordon R. Bennett, (Continued on Next Page)



Sure, we said pass it on, but that's sticking your neck out a bit too far. We don't recommend it. But we do recommend—when it's safe—passing **AIR FORCE** on as soon as you've read it. By sharing a copy with as many men as possible, you will give everyone at your station an opportunity to read the official service journal.



William J. Brownlee, Concetto Castagna, Jr. (Also Air Medal), Frank B. Cooper*, Richard L. Coster, Phillip A. Cratch, Charles R. Deeter, Robert C. Duff, Jr.*, Lyle O. Edwards, Arnold E. Field*, Archie R. Gurkin, Guy H. Hand, Alfred Hays, Earl A. Hood*, Charles L. Hruscky*, Joseph H. Jencuis*, John W. LaBar, Jr.*, Daniel Powloski, Allan G. Rae*, Michael V. Repko, Bertram J. Robas, Stanley J. Rykalski, Paul L. Staton*, James E. Strickland*, Ernest M. Walker, Jr.*, Robert H. Westbrook, Jr.*

Oak Leaf Cluster to Purple Heart

PRIVATES FIRST CLASS: Charles J. Correll, Morris Moskowitz.

DISTINGUISHED FLYING CROSS

LIEUTENANT GENERALS: Frank M. Andrews, Delos C. Emmons, George C. Kenney. **MAJOR GENERALS:** Ralph Royce, Clarence L. Tinker*. **BRIGADIER GENERAL** Joseph H. Atkinson. **COLONELS:** George F. McGuire, Charles B. Overacker, Jr. **LIEUTENANT COLONEL** Paul F. Davis. **MAJORS:** Albert J. Baumler (Also Air Medal), John D. Bridges, Russel A. Cone, James R. Dubose, Ben I. Funk, Cecil S. McFarland, Robert J. Mason, Paul H. Payne (Also Air Medal with Oak Leaf Cluster), Joseph A. Thomas (Also Air Medal). **CAPTAINS:** Frederick L. Andrews, Warren A. Beth, Bert M. Carleton, John W. Carpenter 3d (With Oak Leaf Cluster), John W. Fields, Vernon F. Newton, Richard D. Salter. **LIEUTENANTS:** Lester M. Chancellor, John J. Cook*, Dan M. Erickson*, Lawrence Gardner, James A. Gibb, Jr., Edward H. Higgins, Harvey Dalton Johnson*, Kenneth C. Jones, Richard W. Kimball, Hubert Smith Mobley (With Oak Leaf Cluster), James L. Regan, Francis X. Schwarzenbek. **TECHNICAL SERGEANTS:** David G. Dixon, James A. McVicar, Joseph H. Marling. **STAFF SERGEANTS:** Fred S. Croyle, Paul H. Dortch (With Oak Leaf Cluster), Orin W. Hawkins (Also Oak Leaf Cluster to Silver Star), Douglas H. Logan, Henry B. Pecher, Roscoe P. Rogers, Nicholas V. Stashuk (With Oak Leaf Cluster), Sam Tower, Jack L. Woody. **SERGEANTS:** Sheldon D. Beaton, Carl M. Biehn, Dan Ehrheart, James R. Mathewson, Robert K. Palmer, Elwyn O. Rahier, Lloyd D. Whipp, John J. Wilfley. **CORPORALS:** Harold E. Guse, Henry C. Nosalik, John A. Straight, Jr. (With Oak Leaf Cluster). **PRIVATES FIRST CLASS:** Floyd E. Marshall, Herbert M. Wheatley, Jr.

Oak Leaf Cluster to Distinguished Flying Cross

LIEUTENANTS: Theodore J. Boselli (Second Oak Leaf Cluster), Carl E. Epperson. **STAFF SERGEANTS:** John F. Clark, John C. Haddow.

SOLDIER'S MEDAL

LIEUTENANTS: Frederick R. Beal, Fred W. Edwards, James A. Estes. **STAFF SERGEANTS:** George B. Kirkpatrick, Rodney M. Stone. **SERGEANTS:** Elvin M. Lee, Gordon F. Willis. **CORPORALS:** Henry M. Thomas, Eugene B. Thompson, Jr. **PRIVATE FIRST CLASS** Robert J. Meikle. **PRIVATES:** John F. Hayes, Ivey I. Oakley, Wilbur R. Perkins, Emil R. Popovitch.

AIR MEDAL

MAJOR GENERAL James H. Doolittle. **BRIGADIER GENERAL** Caleb V. Haynes. **COLONELS:** James E. Briggs, Robert Oswald Cork, Emmett O'Donnell, Jr., Stanley T. Wray. **LIEUTENANT COLONEL** Jack N. Donohew. **MAJORS:** Rudolph E. Flack, Kenneth H. Gibson, Isaac J. Haviland, Jr., Gregory F. Keenan, William A. Lanford, Walter Y. Lucas

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(With Oak Leaf Cluster. Also Oak Leaf Cluster to Silver Star and Two Oak Leaf Clusters to Distinguished Flying Cross), Paul W. Tibbets, Jr. (With Oak Leaf Cluster), James W. Wilson, Victor S. Zienowicz. **CAPTAINS:** Virgil C. Alleman, Pat Martin DeBerry, Howard Bowman, Donald S. Dunlap, John D. Eiland, Jr., Richard F. Ezzard, Ernest G. Ford, George W. Gillett, R. C. Lyan, Phillip A. Sykes, Edward F. Tindall, John M. Yancey. **LIEUTENANTS:** Joseph D. Abell, Kenneth W. Ambrose (With Oak Leaf Cluster), Stanley M. M. Anderson, Gene L. Arth, Robert D. Bailin, David F. Barnett, Jr., Harold E. Blanksma, John J. Boll, Elsie S. Ott, William Hughes Young. **WARRANT OFFICER** Lester R. Dowell. **MASTER SERGEANTS:** Edward Maciag, John G. Yates. **FIRST SERGEANT** Bernard I. French. **TECHNICAL SERGEANTS:** Herbert B. Daly, Walter A. Gilbert, Jarvis E. Hall, Stanton E. Hendricks, Stanley C. Jackola, John M. Lambert, Charles Y. MacPherson, Edgar A. McCunney, Karl L. Masters, Michael J. Morrissey, Aaron F. Moses, Robert G. Mumaw, William L. Nisbett, Arvie D. Sirmans, Earle K. Smith, Richard L. Walker, Pete T. Zychal. **STAFF SERGEANTS:** Walter S. Ahrens, Frank L. Batterson, Clair K. Benser, Jack Craig Boyd, Earl J. Deroche, William H. Forrester, Roy H. Gibson, Braden C. Griffin, Conrad A. Handon, James M. Hobbs, Arthur B. Smith, Francis Sulcofski, Lucius W. Treat, Douglas J. Upton, Lewis C. Williams, William E. Williams, J. L. Wiseman. **SERGEANTS:** Alfred Armand, Amos H. Behl, Lorin E. Blanchard, James R. Boyd (With Oak Leaf Cluster), Chester D. Cahill, Stephen M. Cooper, Joseph F. Cummings, Jack F. Delaney, Abraham A. Ehrenreich, William T. Majewski, Lee E. Nelson, Richard A. Williams (With Oak Leaf Cluster), Howard V. Wilpur. **CORPORALS:** Grady W. Anglin, Arthur G. Campbell, Earl A. Hollar, Jack E. Leverone, Frank A. Licordari, Stanley S. Seger, Lester A. Smith, Werner G. Wallace, Elbert C. Wright. **PRIVATES FIRST CLASS:** Eugene Burchard, Robert L. Parks, Glenn C. Richards, Charles H. Torrence, Jack L. Warren. **PRIVATES:** John M. Bowden, Ivan W. Graves, Lloyd D. Moran, Henry J. Schloer, Lloyd A. Shinn, Claude R. Taylor, William H. Yoakum.

*Posthumous

ANSWERS TO QUIZ

on page 17

1. (b.) Insufficiency of oxygen
2. (b.) To one side of it
3. (b.) 30 inches
4. (d.) Cloud formation
5. (d.) A central instructors' school
6. B-24
7. (b.) Micrometer
8. (c.) 45 degrees
9. (b.) False
10. (c.) In arterial bleeding the blood spurts from the artery with each pulsation of the heart; bright red in color. (Blood from the veins flows in a steady stream; dark red or purple. Capillary bleeding is an oozing of blood from a cut surface.)
11. (a.) In front of the engine
12. (c.) \$10,000
13. (d.) I sustain the wings
14. The Air Medal
15. (d.) Ultramarine blue piped with golden orange are the Air Forces colors. (Cobalt blue piped with golden yellow—Chemical Warfare Service; dark blue piped with white—Judge Advocate General; dark blue piped with light blue—Inspector General Department.)
16. (b.) False
17. (b.) North on the ground
18. (a.) Charge of Quarters
- (b.) Army Post Office
- (c.) Bachelor Officers Quarters
- (d.) Officers Candidate School
19. (c.) Compass
20. B-25

HIGH LEVEL JUMPING

(Continued from Page 13)

available. Since the walk-around cylinder can be used without removal of the oxygen mask, it is in some ways superior to the bail-out bottle in the case of emergency. It could be employed at least up to the point of clearing the ship.

Even with this emergency equipment, however, free fall still remains one of the best answers in parachute escape from high altitudes. The accompanying chart shows the comparative rate of descent between free fall and open parachute fall. It is readily seen that an airman's exposure to low oxygen tensions and extreme cold of higher altitudes is drastically shortened if free fall is employed until he reaches lower levels.

Simulated free-fall parachute descents in a low-pressure chamber have shown that descent from 40,000 feet can be carried out without loss of consciousness or use of any oxygen equipment, if a deep breath of oxygen is taken prior to the start of the fall and held for as long as thirty seconds.

If this provision is not met, a brief span of unconsciousness will result. This period of unconsciousness is very short and, except in the case of an injured man, it is believed that recovery can be made in plenty of time to allow for the opening of the parachute. In fact, most flyers probably wouldn't recognize that they had had a lapse of consciousness due to lack of oxygen.

In a series of laboratory tests at Wright Field in which the conditions of loss of consciousness at altitudes of from 30,000 to 36,000 feet were simulated, the subjects

"free fell" and all recovered sufficiently to pull the rip cord between 2,200 and 25,000 feet. The average pull was made at 14,000 feet.

The effect of free fall on the ears is great and rupture of the eardrums may occur unless the parachutist is able easily and readily to clear his ears. Still, the danger of rupture is not so great if free fall is employed only at higher altitudes and is stopped by opening the chute at about 15,000 feet. Moreover, it should be borne in mind that although they are painful and temporarily incapacitating as far as flying is concerned, the prospect of ruptured eardrums should not be given too much consideration when an emergency parachute escape is involved.

ASIDE from its tendency to forestall loss of consciousness in high altitude escapes and the protection it affords from quick-triggered adversaries, the free-fall procedure has other advantages. In leaving a high-speed fighter plane, the pilot may experience difficulty in getting out and the speed imparted to the falling body may snap the parachute shrouds if the chute is opened too soon. Free fall should be employed in such cases until the velocity imparted by the plane is materially lessened. This, of course, is dependent on the altitude at which the pilot has bailed out. It is recommended, whenever possible, that fighters be pulled almost to a stall before pilots leave them.

Then, too, there is always the danger of the parachute becoming fouled with the falling plane if it is opened too soon. Here again, common sense must be exercised.

There is at least one case on record where even the exercise of good common sense on the part of the pilot almost failed to separate his free-falling body from the falling aircraft in time to permit the safe opening of his chute.

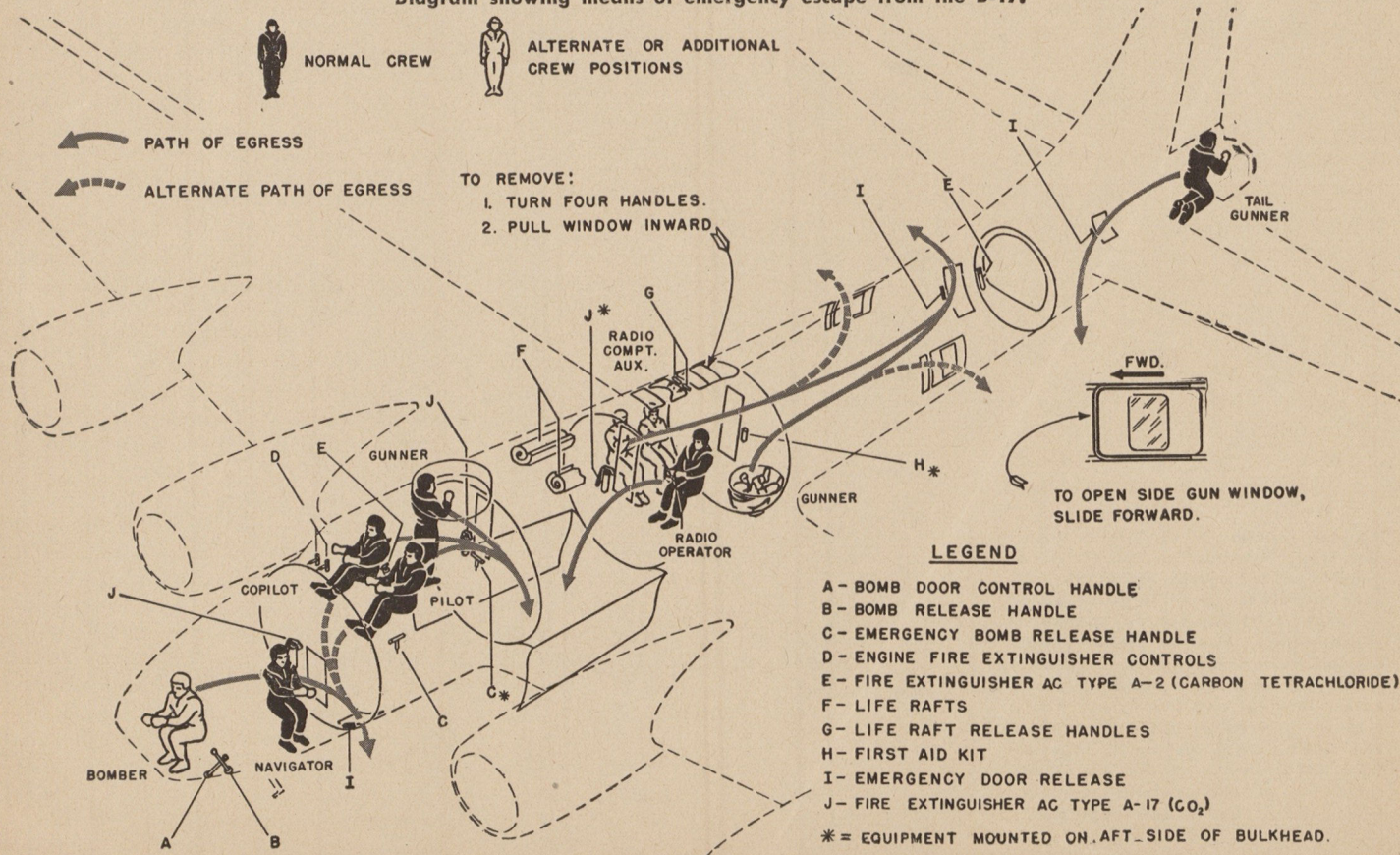
In this case a fighter plane went into a spin, completely out of control. The pilot decided to abandon the ship and attempted to crawl out on one wing so he would be thrown clear. He pulled himself a few feet along the wing surface and slipped off.

Seconds later with plane and pilot at about 3,000 feet, a portion of the whirling plane struck him on the side of the head and scraped some skin from his back. Although he feared he might lose consciousness, the pilot wouldn't open his chute because the falling plane was still above him.

The plane was still above the pilot at 1,200 feet but he decided it was about time to check on the chute. He felt for it but it wasn't there. He fumbled for the chute and found it tangled around his ankles. The chute had been knocked down by the impact of the plane.

By the time the pilot had his chute under control, he had dropped to about 600 feet. But the plane was still overhead. Nevertheless, his one chance was to pull the rip cord and cross his fingers. The parachute responded immediately, although in opening it bounced off one wing of the falling plane. The fabric was ripped a bit in the collision but the pilot landed safely. It was a rather rough initiation into the Caterpillar Club, but it goes to show that a lot can happen after a bail-out and still find you alive to tell about it. ☆

Diagram showing means of emergency escape from the B-17.



PREPARE FOR TROUBLE!

Your knowledge of emergency equipment can mean the difference between life and death.

PREPARED BY THE ARCTIC, DESERT AND TROPIC INFORMATION CENTER,
EGLIN FIELD, FLORIDA

SPECIALIZED studies in the technique of forced landing procedure and survival in non-temperate zones, made by the Arctic, Desert and Tropic Information Center of the AAF, reveal that an all-important factor in survival is the proper selection and use of Emergency Kits. It is the purpose of this discussion to present the picture of Emergency Kits as it currently exists.

Air Forces Emergency Kits have been designed and assembled by the Materiel Command to fit the special needs dictated by the character of the flight and the type of terrain over which it is made. Because the decision as to what type of emergency equipment is to be carried rests eventually with the individual pilot and crew, it is to the interest of all flying personnel to know what emergency equipment is available.

To begin with, it will pay to learn and practice these three cardinal principles:

➔ Select the Emergency Equipment you intend to carry on the basis of the nature and requirements of your mission, as well as on the weight and space allowance of the aircraft. Consider all the factors: whether you will operate over water, whether you may be forced down in enemy territory, etc.

➔ Check the equipment carefully before your takeoff. Understand its use. See that it's all there. Test it to make sure it will work when you need it.

➔ Keep your emergency equipment readily accessible (strap on the kits intended for carrying on your person); keep the other kits within reach, where you can put your hands on them instantly in an emergency.

Let's look over the Emergency Equipment set-up. At present, there are three main categories available. They include:

1. **First-Aid Kits.** These include emergency medical first-aid equipment. Two such kits are available—see descriptions below.

2. **Flotation Equipment.** This equipment is carried in aircraft for use in the event of emergency on overwater flights. It includes a pneumatic life preserver vest and a variety of life rafts—see descriptions below.

3. **Sustenance and Implement Kits.** These kits fall into four groups: (a) parachute back- or seat-pad Emergency Kits; (b)

Personal Kits—these are attachable to, or can be carried on the person of pilots and crew members; (c) Airplane Kits which are carried in the aircraft; and (d) Dropping Kits transported by plane to the disaster—see description below.

The chart which accompanies this article indicates the Emergency Equipment and Kits currently available, and shows the zones and purposes for which they are intended. Detailed descriptions of the current Emergency Equipment follow:

FIRST-AID EQUIPMENT

First-Aid Kit, Aeronautic: Installed in all aircraft, based on the use of one kit for each two men. Components: surgical dressing, sulfanilamide powder, sulfadiazone ointment (for burns), syrettes morphine tartrate (hypodermic to relieve severe pain), scissors, adhesive bandages and iodine swabs for care of minor wounds.

First-Aid Kit, Parachute: A compact package that is either tied to the chute harness or carried in the pocket. Components: dressing for wounds, syrettes, tourniquet.

FLOTATION EQUIPMENT

The "Mae West": A pneumatic life preserver vest, well-known to all personnel.

Pneumatic Life Rafts: Six types are currently in use by the Army Air Forces—**Type A-2** (1,000 pound capacity), **Type A-3** (1,000 pound capacity), **Type B-3** (500 pound capacity), **Type B-4** (500 pound capacity), **Type C-1** (250 pound capacity), and the One-man Parachute-type Pneumatic Life Raft.

Types A-3, B-3, B-4, and C-1 are of an early design and are being superseded by types A-3 and the One-man Parachute Rafts. The **A-3 Raft** is used on all airplanes having crews of more than three men. Crews of 4-5 men use one A-3 raft; crews of 6-12 men use two A-3 rafts; crews of 12-15 men use three A-3 rafts. The **Type A-3 five-man pneumatic life raft** is designed for storage in the raft compartment of airplanes. It can be automatically inflated by means of control cable, hand releases, or manually by release cords. The following accessories are included in secured pockets and containers:

It is the function of the Arctic, Desert and Tropic Information Center (Headquarters at Eglin Field, Florida) to prepare and disseminate information on all aspects of Air Forces operations (maintenance, health, shelter, clothing, etc.) in non-temperate zones. Information on forced landing procedures, survival and Emergency Kits is a major interest of this organization. The ADTI Center welcomes inquiries from all branches of the Air Forces, concerning problems relating to operations in Arctic, Desert and Tropic areas.

pyrotechnic pistol and distress signals, seven 12-ounce cans of water, three sea markers, flashlight, scout knife, police whistle, first-aid kit, two emergency fishing kits, shade and camouflage cloth, combination signal, watercatching and sail cloth, two oars, hand pump and hose, bailing bucket, repair kit, four bullet-hole plugs, 40 feet of cotton cord. The container also has provision for housing radio apparatus.

The One-Man Parachute Raft is designed to supplement the seat-type or back-type parachute, and occupies whichever position is free. The raft is automatically inflated in a few seconds by a carbon dioxide infiltration cylinder when the attachment cord is pulled. The One-man Raft is equipped with a sea-anchor, a bailing cup, two hand paddles, a first-aid kit, a can of drinking water, two bullet-hole plugs, patching material, a can of fluorescein dye (to be spread on the water as a distress signal marker), a waterproof cloth (for use as a shade cloth, watercatching, signal, sail, or camouflage cover).

SUSTENANCE AND IMPLEMENT KITS

Alaskan Emergency Kit, Type B-1. For personnel flying in the north. A back-pad kit designed to take the place of the conventional back pad on the parachute. Contents: cooking kit, match case, emergency rations, gloves, mosquito headnet, pocket knife, fishing equipment, insect repellent, bouillon cubes, and camphor gum.

Jungle Emergency Kit, Type B-2. For personnel flying in the tropics. A back-pad kit designed to replace the conventional back pad on the parachute. Contents: compass, emergency rations, match case, flare, gloves, mosquito headnet, machete, sharpening stone, fishing equipment, insect repellent, and first-aid kit.

Basic Parachute Emergency Kit, Type B-4. This kit, designed for both Arctic and tropic use, will replace the B-1 and B-2 kits when the present supply of those kits is exhausted. Consists of a seat or back-pad type kit, approximately 15 inches by 13 inches; has felt inset with cutouts for holding components; enclosed in a zipper-fastened canvas cover. A one-inch thick pad serves as a cushion. The kit may be used as a knapsack after landing. Contents: signal flares, machete, signal panel, special parachute kit ration unit made up of Field Ration "K" components, match case with matches, cooking pan, compass, pocket knife, fishing kit, can of solid fuel, first-aid kit, mosquito headnet, goggles, and gloves.

PERSONAL KITS

Emergency Sustenance Kit (Escape) Type E-3. Designed to be carried in the pocket and used when forced to bail-out over enemy territory. Packed in cloth bag, twelve inches by 6 inches (may be used later as a water container). Contents: matches, compass, hacksaw blade, halazone tablets, ben-

zedrine tablets, Field Ration "D", dextrose tablets, bouillon powder, chewing gum.

Emergency Sustenance Kit (Individual Bail-out Rations) Type E-6. Supplies additional rations; can be snapped on chute harness before bailing out. Contents: two units of Field Ration "K".

Emergency Sustenance Kit (Individual Bail-out Water) Type E-7. Provides two cans of drinking water (boiled and pasteurized) to be snapped on chute harness.

AIRPLANE KITS

Emergency Sustenance Kit (Rations) Type E-1. Intended to provide rations and miscellaneous equipment for flying personnel in northern climates. One kit is carried for each two men in the crew. Packed in a fibrepax drum, 11½ inches by 19 inches. Contents: U. S. Army Mountain Rations, drinking water in two-pint cans, match box and matches, hunting knife, mess kit, mosquito headnet, mosquito repellent, canvas gloves, Mukluks, ice crampons, solid fuel and grill, sewing kit, and FM 31-15.

Emergency Sustenance Kit (Implementations) Type E-2. Intended to supply the necessary implements for use in northern climates. Housed in a metal container which will also serve as a wood stove. (Designed for use with food components of the Type E-1 kit.) Contents: combination .22 caliber and .410 gage gun, ammunition, matches in match box, camphor (Continued on Page 38)

ARMY AIR FORCES EMERGENCY EQUIPMENT AND KITS

TYPES OF KITS	ARCTIC	DESERT	TROPIC	OVERWATER
FIRST-AID	FIRST-AID KIT (Aeronautic) Basic medical first-aid kit—carried in the airplane—one kit for each 2 men FIRST-AID KIT (Parachute) Minimum essentials—carried on person or tied to chute harness	FIRST-AID KIT (Aeronautic) Basic medical first-aid kit—carried in the airplane—one kit for each 2 men FIRST-AID KIT (Parachute) Minimum essentials—carried on person or tied to chute harness	FIRST-AID KIT (Aeronautic) Basic medical first-aid kit—carried in the airplane—one kit for each 2 men FIRST-AID KIT (Parachute) Minimum essentials—carried on person or tied to chute harness	FIRST-AID KIT (Aeronautic) Basic medical first-aid kit—carried in the airplane—one kit for each 2 men FIRST-AID KIT (Parachute) Minimum essentials—carried on person or tied to chute harness
FLOTATION	MAE WEST Pneumatic life preserver vest A-3 5 MAN RAFT Complete with accessories ONE MAN PARACHUTE RAFT Seat or back type—with accessories	MAE WEST Pneumatic life preserver vest A-3 5 MAN RAFT Complete with accessories ONE MAN PARACHUTE RAFT Seat or back type—with accessories	MAE WEST Pneumatic life preserver vest A-3 5 MAN RAFT Complete with accessories ONE MAN PARACHUTE RAFT Seat or back type—with accessories	MAE WEST Pneumatic life preserver vest A-3 5 MAN RAFT Complete with accessories ONE MAN PARACHUTE RAFT Seat or back type—with accessories
BASIC	B-4 BASIC PARACHUTE KIT Seat or back-pad type*	B-4 BASIC PARACHUTE KIT Seat or back-pad type*	B-4 BASIC PARACHUTE KIT Seat or back-pad type*	B-4 BASIC PARACHUTE KIT Seat or back-pad type*
PERSONAL	E-3 ESCAPE KIT For bail-out emergencies in enemy territory E-6 BAIL-OUT RATIONS E-7 BAIL-OUT WATER	E-3 ESCAPE KIT For bail-out emergencies in enemy territory E-6 BAIL-OUT RATIONS E-7 BAIL-OUT WATER	E-3 ESCAPE KIT For bail-out emergencies in enemy territory E-6 BAIL-OUT RATIONS E-7 BAIL-OUT WATER	E-3 ESCAPE KIT For bail-out emergencies in enemy territory E-6 BAIL-OUT RATIONS E-7 BAIL-OUT WATER
AIRPLANE	E-1 ARCTIC RATIONS E-2 ARCTIC IMPLEMENTS E-4 COOKING UNIT	E-8 DESERT IMPLEMENTS E-9 DESERT RATIONS E-4 COOKING UNIT	E-8 TROPIC IMPLEMENTS E-9 TROPIC RATIONS E-4 COOKING UNIT	E-5 OVERWATER IMPLEMENTS AND RATIONS E-9 RATIONS
DROPPING	E-12 ARCTIC AERIAL DELIVERY KIT Rations, shelter, clothing, etc.	E-10 DESERT-TROPIC AERIAL DELIVERY KIT Rations, shelter, implements	E-10 DESERT-TROPIC AERIAL DELIVERY KIT Rations, shelter, implements	E-11 OVERWATER AERIAL DELIVERY KIT Rations, implements

*B-1 and B-2 kits will be used until present supply is exhausted.

AERIAL TORPEDO



By Captain J. P. Muri

TORPEDO attack is a difficult form of aerial warfare.

There is the torpedo itself. When operating with regular bombs against land targets, you can generally utilize every virtue of your airplane—its speed, ceiling, maneuverability and so on. You can plan the attack on the basis of your aircraft's particular abilities.

But the torpedo is an involved mechanism. It has certain characteristics which govern the manner and speed and height of its launching if a high probability of success is to be assured. Thus, your flying technique must be suited principally to the projectile, rather than the plane.

The enemy, familiar with these characteristics, knows just about how you will attack.

Torpedoes of all nations are similar. Naturally, the technique of launching them from aircraft is similar the world over—except for minor variations. Commanders of enemy warships are thoroughly schooled in such knowledge. Aware of the altitudes and distances from which torpedoes may be effectively released, they can plan their own gunnery fire and other protective measures accordingly.

Lastly, you must outwit a moving target. This requires, above all, an exhaustive knowledge of the enemy. You must be able to recognize quickly the type of ship you are attacking and to know its possible speed, type of armament, weaknesses of armor and other data. For it is such things which should determine your own approach and getaway.

Despite these difficulties, the air-launched torpedo has demonstrated itself to be one of the war's deadliest weapons.

A torpedo hits big ships where they are most vulnerable, below the waterline, and where the force of the explosion is confined and concentrated.

Incidentally, this article concerns only torpedo attack by land-based aircraft—principally medium bombers. No attempt will be made to describe the tactics and training of Navy fliers equipped with seaborne

planes. It should be borne in mind that various means are employed to diversify the enemy's protective fire and thereby assure a greater degree of fatal damage to him.

The modern torpedo is a self-propelled, self-controlled underwater missile with a heavy explosive charge. It is about 13½ feet long, over 20 inches in diameter, weighs approximately 2,000 pounds, carries TNT in the nose, or "warhead," will travel long distances, will find and hold a pre-set depth, and will maintain accurately the course upon which it is launched or may be adjusted so as to start on that course and later turn on a pre-determined angle for purposes of deception.

A TORPEDO has four main sections—warhead, airflask, afterbody and tail.

The warhead, made of thin reinforced steel or bronze shell, carries the explosive, a detonator and a mechanism which renders the charge harmless until the torpedo has run a few seconds.

Back of this is the airflask. Made of high alloy steel, it carries a sufficient supply of air to support combustion. Ends of the airflask are closed with steel bulkheads. Behind the aft bulkhead is a section to hold water and fuel.

In the afterbody are situated the turbines and controlling instruments of the torpedo.

In the tail are mounted rudders, counter-rotating propellers, vertical and horizontal stabilizers.

When a torpedo is dropped air pressure from the flask opens starting valves, air is released into a combustion pot, fuel is forced into the combustion pot by a stream of air while still another jet strikes a cap on an igniter, causing it to burn.

Thus, in a combustion chamber there is flame, air, and a spray of fuel. Resulting gases are forced through nozzles to a pair of turbines mounted on concentric shafts. After imparting their energy the gases pass out through the tail to the sea, making the characteristic parallel wake of the torpedo. The turbine wheels drive propellers which,

in turn, drive the projectile through the water.

Obviously, with such a fine mechanism, the manner of launching becomes the all-important factor in an attack.

The depth at which you want the torpedo to travel is determined beforehand and an instrument setting made. Should your target call for a different setting, this can be accomplished from within the plane while flying. The direction in which the torpedo should travel is governed by a special sight.

In launching a torpedo, there is a vital matter known as the "entrance angle."

When a torpedo is dropped correctly, you will see a white circle on the water, then a straight white line like a piece of string being drawn across a blackboard. This means that gyros, rudders and depth controls are operating properly.

But frequently a torpedo will "porpoise"—that is, skip sharply right or left or even out of the water for several yards. This can occur because of a too shallow depth setting or, more often, because of a bad entrance. Usually, the gyro will correct a "porpoise" and return the projectile to its pre-set course but this variation of twenty-five yards or so may result in a miss fore or aft of your target. If the entrance has been really bad, the torpedo may even sink.

There is only one answer to the entrance problem—proper flying.

Experience has shown that the best torpedo entrances are made when a plane is flying absolutely straight and level at an altitude depending directly on the plane's speeds.

It is apparent that, with a land plane, one of the chief problems is to slow down. And to slow down without becoming too much of a "sitting duck" target.

To carry out an attack of this sort, it is clear that a rugged airplane with good evasive action and protective guns is required.

ILLUSTRATED BY
CAPTAIN RAYMOND CREEKMORE

AIR FORCE, June, 1943

The Commanding Officer of an AAF torpedo squadron describes the use of one of the war's most deadly weapons

Torpedo tactics as taught now are a far cry from the instruction earlier in the war. When we went out at Midway we had had four days practice in torpedo work. About all we knew was to come in toward the bow of a ship, to duck and dodge, and to keep out of crossfire. We ran into about 40 ships and there was no remote hope of keeping out of crossfire.

A lot has been learned since then, however, and the experience of pilots from the Aleutians to the Solomons is embraced in the training course now given.

The course naturally consists of both lectures and practice. First, flight crews are given extensive information about the torpedo itself—what it can do, what kind of missions it should be used on, its mechanical operation.

From this they go on to study the technique of dropping, the principles and pro-

cedures of torpedo runs, and ship structure and identification. Then comes the tactical details—how to take evasive action; how to attack; how to change formation; how to take advantage of weather and natural elements, such as making dawn and dusk approaches, keeping darkness or coastline hills in the background to minimize detection, and so forth.

DURING the course, much attention is given to dry runs in a hangar with a machine that simulates flying, like a Link Trainer. This battery-operated device is mathematically set up with sights allowing for distance, altitude, and other factors. On this machine, bomber crews learn the all-important knack of "leading the target," a process similar to shooting skeet and, in torpedo work, quite as essential to success.

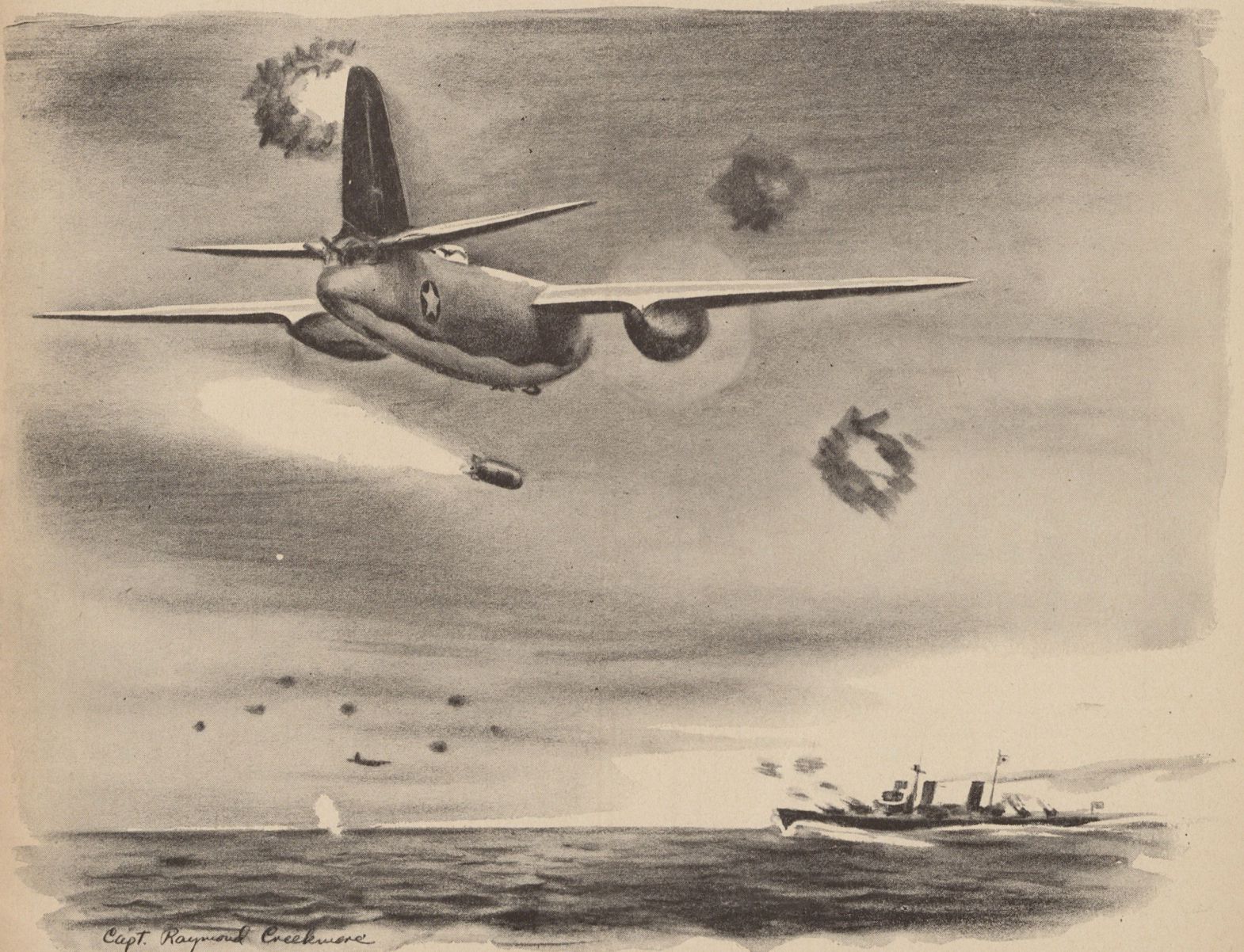
Following instruction of this nature comes

actual flying over water. There are many hours of straight formation flying at low altitudes—legalized "buzzing"—so that crews can learn the very difficult art of estimating distance on water and get accustomed to certain other problems, for example, the general inaccuracy of altimeters in low, over-water flight.

Then there are camera runs on targets, with the camera revealing the angle from which an attack was made, the distance and altitude of the drop, and the probability of a hit or miss.

Lastly, there are actual runs on a target boat with dummy torpedoes. These projectiles are the same weight and size as regular torpedoes, the only difference being that the warhead is loaded with water instead of TNT.

To supply this latter form of training, the training base maintains an 83-foot, speedy target boat and a diving outfit with the function of retrieving all torpedoes. Operations of these Army "sailors" provides bomber crews with the most realistic torpedo practice possible. ☆



ANGELS DON'T SHOOT GUNS

(Continued from Page 12)

stubborn .50 caliber. "I can shoot them damn Jerries down with one gun just as well as two. I'll even go up without any guns."

Shorty and his guns went, of course, and before they reached France both guns were working. On the way in the bombardier spotted two FW-190s coming in head-on and called out the direction of the attack.

"I turned my turret to the front and raised my guns," Shorty says. "Then Lieutenant Cunningham pulled up the nose so I could get at them and there was an FW about 100 feet away. His wings looked like they were on fire because all his guns were going at once. I thought I was a goner then but I got in a quick burst. He flipped over as he went past. I tried to swing after him and get in another burst but he was going too fast. He was only 50 feet away and I got a glimpse of the pilot in the cockpit.

"He was wearing goggles and a leather mask over his face. He was looking at me and I was looking at him. That's all there was to it. But I was damned scared at the moment."

Shorty Gordon went cold all over in that split second he was looking into the eyes of the enemy. But it was a thrill. It was what he had joined the U. S. Army Air Forces for. It was that sort of excitement he craved when he was risking his neck as a "gow" driver back on the flat desert race tracks of his sunny California, roaring along behind the wheel of a souped-up little Model A. It was the kind of adventure he had hoped to find as a gunner in the RCAF before the U. S. got into the war, but the recruiting officer told him he was one inch too short for the job.

Shorty had doubted whether he could find excitement in the U. S. Army Air Forces because his country was then at peace. But he took a chance on it October 22, 1940, at Fort MacArthur, California, and got into the 9th squadron of the 7th Bombardment group.

When the 7th left Salt Lake City for foreign service in November 1941, Shorty was left behind—in the guard house. An MP had accused him of being improperly dressed, and Shorty, with his love for casual dress—and fighting—had . . . well, three months at hard labor didn't dim his appetite for the Air Forces. In fact, Shorty claims he had a wonderful time in the guard house, especially after he became a parole prisoner and was free to carry on a lucrative little beverage trade with the Sergeant of the Guard.

ON the last day of his sentence he was planning to ask for a transfer to the Philippines. From there he intended to hop to Burma and join up with the Flying Tigers as a ground man. But on that day he heard about Pearl Harbor. That was all he wanted. He got into the first heavy bombardment group he could find, left his job as an armorer to take up gunnery, and found himself between a pair of fifties in the ball turret.

So now he's over German-occupied Europe, spinning his turret and searching forward . . .

This is not all there is to the story of a ball turret on a Flying Fortress. Nor is it much of a piece on that bloodthirsty, thrill-seeking, iron-gutted, lovable little man whom you may now be calling a devil, or a

hero. Unless you have been squeezed into a small glass ball for four or five hours at 20,000 feet, it's hard to understand what happens when the cold and the cramps and the fighters set in.

Some ball turret gunners will tell you of the time the door on the turret opened and left them literally hanging on to their guns against a 160-mile-an-hour wind.

Others may tell of the discomfort of the electric suit when it gathers up in a fold on their groin and blisters them with heat. The heat makes them urinate, and that freezes their clothes to the turret so they couldn't fall out even if they wanted to.

They'll tell you of that sickening feeling that comes when your guns freeze up, or jam, and you have to stay in the turret, turning the useless weapons at the fighters to make them think you're still in action.

And some will tell you of their pals, bunk dreaming, who see fighters coming at them, with wings afire, and flak bursting around so thick you can walk on it . . .

It's a good thing that all gunners tell each other they're "flak happy". Because joking about it eases the strain.

Shorty Gordon eases his nerves after a mission by taking a triple Scotch, "and more if I can get it."

Then he might go off on a 48-hour pass to see his girl. The one he's going to marry after that 25th mission. ☆

Since this story was written, Shorty Gordon has been reported missing from a raid on Germany. Crews in other ships of his formation saw his Fortress go down, one white parachute billowing out above the plane. Shorty was wearing his chute on that trip. They believe the one they saw was his.

PREPARE FOR TROUBLE!

(Continued from Page 35)

cubes, generator-operated flashlight, candles, compass, frying pan, stew pan, large spoon, butcher knife, cooking oil, machete, fishing kit, and signal flares.

Emergency Sustenance Kit (Cooking)
Type E-4. An emergency cooking unit employing a pressure type gasoline stove burning 100 octane gasoline. Includes: two stew pans, frying pan, fabric gasoline bag.

Emergency Sustenance Kit (Overwater)
Type E-5. Designed for carrying in large aircraft operating mainly over water. Contents: Field Ration "K", drinking water in cans, flashlight, compass, matches, knife, hand-axe, mirror, candles, fishing kit, flares, paulin, bailing bucket, sea markers, rope, tomato juice. This kit is used in addition to the kit supplied in the life raft.

Emergency Sustenance Kit (Desert and Tropic Implements) **Type E-8.** For desert and jungle use. Contents: combination .22 caliber and .410 gage gun, ammunition, generator flashlight, machete and sheath,

flares, paulin, mirror, first-aid kit, sewing kit, soap, and sunburn ointment.

Emergency Sustenance Kit (Desert and Ocean Rations) **Type E-9.** Contains the necessary rations for desert, jungle and ocean emergencies. Contents: drinking water in cans, Field Ration "K", paulin, and sun hats.

DROPPING KITS

Emergency Sustenance Kit (Tropical Aerial Delivery) **Type E-10.** Intended for use in tropical areas for dropping the necessary rations and equipment to aircraft personnel stranded in the desert or jungle. Contents: Field Ration "K", drinking water in cans, tent, sun hat, neckerchief, paulin, solid fuel and grill, insect repellent, generator flashlight, mirror, flares, combination .22 caliber and .410 gage gun, ammunition, scout knife, compass, sewing kit, machete and sheath, atabrine tablets, benzedrine sulphate tablets, soap, tea tablets, matches, and sunburn ointment.

Emergency Sustenance Kit (Shipwreck) **Type E-11.** Designed for carrying in patrol

planes. Intended to offer temporary relief, pending rescue, to victims of a disaster at sea. Packed in a free-falling container. Contents: drinking water in cans, Field Ration "K", Very pistol, matches, heat pads, first-aid kit, sea markers, police whistle, bailing cup, flares, sponge, mirror, fishing kit, knife, water bag, paulin, compass, blankets, cloth helmets, channel swimmers' grease.

Emergency Sustenance Kit (Arctic Aerial Delivery) **Type E-12.** Intended for use on the Greenland Ice Cap and in similar desolate Arctic areas. Designed for dropping by parachute to help sustain life of stranded aircraft personnel until rescue arrives. Contents: 2 parkas and 2 trousers, 2 sleeping bags, 2 one-man tents, pneumatic mattress, gasoline stove, 2 one-gallon gasoline containers, ice saw, ice-axe, 2 pairs crampons, intrenching shovel, goggles, 4 pairs mittens, 6 pairs socks, 2 pairs wristlets, 2 mufflers, Type E-1 Ration Kit, and Type E-2 Implement Kit. Implements and rations are dropped in a chute container; clothing, sleeping bags, etc., are free-falling. ☆

A study of personnel problems and techniques in the Army Air Forces.

and duty assignment of each man. The efficiency of a squadron, or of an Air Forces unit, depends immeasurably on getting the right man in the right place.

Malassignment and maldistribution are haunting problems. But accurate records and prompt recognition of the personality and training necessary for each squadron specialty can aid inestimably in the elimination of these two bugaboos.

Take the case of Corporal Y. When our squadron was activated he became a heavy refueling unit operator, assigned to that specialty because they needed one. By virtue of his training and interests, Corporal Y was obviously equipped to fulfill a specialty much higher than the one he occupied. Yet the necessity of the moment ordained otherwise. It came to the attention of the personnel officer that this soldier was using his spare time to observe the mechanics at work. On one or two occasions he even diagnosed the

Prompt action at the squadron level can correct waste. How? Well, let's try to visualize what happens to a soldier from the time he reports for squadron duty until he is efficiently located in his proper capacity.

Upon reporting, each man presents his service record, AGO Form 20, and allied papers (compliance with AR 345-125, Change 9, dated November 28, 1942, is important). These records are carefully studied by the personnel officer and the man is interviewed.

The importance of this first interview cannot be overstressed. What is the man's personal appearance? Is the salute military? How does he answer questions? Do his personality and overt intelligence compare favorably with his AGCT scores? Did he choose this specialty or was it imposed upon him? A chance question may unfold an experience which will change the soldier's Army career. Is he interested in OCS? What is his "overseas" attitude?

THIS interview may reveal, and frequently does, that War Department objectives and aims as outlined in AR 615-25, 615-26, 615-28 and 605-90 have been thwarted. It may show that some of these men are unfit for training in a unit preparing for overseas combat, because the personality, the psychological and physiological format of certain of these individuals render it unwise to waste time and money on their training.

Assuming that the interview results in a proper classification and duty assignment for the soldier, and that his records are in order, he will begin his training. Very few of the enlisted men reporting are at once equipped to function in a "trained" capacity. Most are graduates of some Air Force technical school, some are christened in their specialties, others inherit them like the meek. They must undergo a lengthy period of departmental training, gradually accomplishing the transition from "in training" to "trained" over a period of months. (Note: In our squadron the number of men equipped to function at once in a trained capacity was only four per cent, discounting the original cadre.)

Some men need additional technical training. Suppose, for example, orders should be issued to change from a liquid-cooled aircraft engine to the radial engine. This involves additional schooling for nearly all the engineering specialties and added education for numerous specialists from supporting departments such as armament, ordnance, communications and supply.

Once safely launched on their departmental careers, the men must be trained rapidly but efficiently in the art of their specialty. A man is not "trained" in our squadron until he can perform his operational duties without supervision. But he may never be trained, even after the achievement of technical perfection, unless he knows how to work with his fellow soldiers. The person-

THIS QUESTION OF MANPOWER

By

Lieut. Matthew Huttner

STATISTICAL OFFICER OF A FIGHTER GROUP

trouble to the amazement of those present. An alert crew chief perceived Corporal Y's interest and ability and advised him to see the personnel officer at once. A brief interview resulted in the reclassification and reassignment of Corporal Y. Today he is one of our most industrious and capable crew chiefs.

Then there was Sergeant J, an excellent sheet metal worker, but also a crack mechanic. Although he was classified as the former, the engineering officer wisely realized that it takes much longer to train a highly skilled AM than a sheet metal worker. Today Sergeant J is a flight chief, an asset to his outfit.

The record is replete with such instances of malassignment and reclassification. Because the Army Air Force has grown by leaps and bounds, its rapid expansion has created problems in personnel which are now apparent.

A squad board simplifies the morning report.

PRIVATE X enters the squadron orderly room. He salutes smartly. On the desk of the personnel officer lie his service record and AGO Form 20. They have been carefully scrutinized to determine his fitness for classification and duty assignment.

"Did you ask to be trained for the job of teletypewriter operator?"

"No, sir", he replies, "I'd like to be in the kitchen cooking. I used to be a butcher and a cook." (Form 20 corroborates this.)

He is asked why he was sent from group headquarters as a TWX operator.

"They needed one, sir. So they told me I was to learn operating", he reveals.

Further examination shows him to be valuable as a cook, less so as a TWX operator. Fortunately, one of the present cooks is classified as limited service, awaiting transfer. Private X is placed in the mess hall under supervision. The mess sergeant reports favorably on his work. Obviously the right thing to do is to recommend him for reclassification as a cook to the base reclassification board, transfer the limited service overage, and everybody is happy.

But suppose he had not been reclassified. Then he would have been like hundreds of others who pass through the Army Air Forces groups every month, shuttling back and forth between feeder and combat units until they find the right spot.

More than the other arms and services, the Army Air Forces is composed of individual specialists, making more complex its problems of personnel. A single fighter squadron like ours contains sixty different types of specialists ranging from the commanding officer down to the lowest basic. This, in a unit of less than 275, places a heavy premium on the proper classification

ality element is vital in overseas combat. "Keeping 'em flying" is not accomplished by mere technical skill alone. The will to win and the ability to withstand pressure under fire are equally important.

One of our squadron department heads outlined what he thought were the foremost criteria in judging a man's fitness for the position he holds:

I. *Proficiency* of man in his particular craft, skill or endeavor (including manifested interest therein).

II. *Military aptitude, demeanor and bearing.*

III. *Reliability, integrity and fidelity.*

IV. *Resourcefulness and perseverance.*

V. *Personality* (i.e. the degree of success in relationships with superiors, subordinates and other associates).

Compare these with the principles laid down in a training directive of our parent group:

A. *Discipline* that permits unquestioned obedience under battle conditions.

B. *Health, strength and endurance* to withstand the rigors of global warfare.

C. *Technical proficiency* to the extent of not only knowing your equipment but to improvise ingenious substitutes when normal sources of supply fail.

D. *Initiative* enough under abnormal conditions and emergencies to start proper action in the absence of orders.

E. *Leadership* to control subordinates.

F. *Teamwork* to work harmoniously in achieving tactical proficiency and the ultimate success of the unit in combat.

G. *Responsibility* for assigned materiel and personal acts.

H. *Tactical proficiency* in ground and air combat.

The progress of the specialist is charted in many ways. The Army Air Forces recognizes the importance of combat training and wisely provides for its recording by a number of personnel techniques, including:

A. AAF Forms 127 and 128.

B. AAF Forms 125 and 126.

C. The service record and AGO Form 20.

To these, the squadron has added:

D. The weekly department roster.

E. A squadron board.

F. Squadron Form 20a (used when AGO Form 20 is not at hand).

Such mimeographed devices as departmental assignment and transfer slips, work orders, training charts, ground and air echelon rosters based on the T/O are also employed whenever necessary.

TO BEGIN a discussion of all these techniques is in itself material for a lengthy article. However, a number of interesting facts present themselves in connection with the use of the various forms:

I) *AAF Forms 127 and 128*—present an excellent and accurate bi-weekly birdseye view of squadron personnel, revealing the percentage of trained and untrained men and the shortages and overages as well as promotion potentialities. Form 127 is the most

important personnel report in the Army Air Forces because it is useful in all echelons. It should be prepared with painstaking accuracy and should reflect authoritatively the training progress of every unit. Guessing destroys its aims and purposes.

To make it more scientific, a weekly departmental roster such as used by our squadron is suggested for adoption. Prior to every Tuesday at 1200 each department is required to submit a personnel roster by name, rank, serial number, "trained" or "in training", duty rating, and section assignment (Flight A, B, C or Headquarters). This simple device enables the 127 to reflect a true picture of squadron personnel achievement. Up to the minute cooperation from group and wing results in prompt transfer of overages and equally prompt fulfillment of shortages.

II) *AAF Forms 125 and 126*—In an effort to improve its personnel setup the Army Air Forces initiated the Macbee key-sort system consisting of Forms 125 (Officer) and 126 (EM) accompanied by a pick and punch and metal container, a strange but effective assortment. Like many novel devices, its debut was greeted with some skepticism and there had been little training in its use. But properly employed, it has advantages for Army Air Force use over the AGO Form 20. Since the Macbee system contains all the necessary information in a simple form, it is practical to use and easy to teach. And, its simpler operation makes it easier to keep up-to-date. Furthermore, the fact that the forms coincide in format with the arrangement of Form 127 makes their use doubly valuable. Statistical control units and statistical officers rely on the Macbee system to streamline the personnel setup of the Army Air Forces. And in big business it has already proved itself an adequate proving ground for the Army Air Forces.

III) *Squadron Board*—Using a "visual morning report" or squadron board enables you to determine the immediate classification, duty assignment, and present status of every individual in the unit 24 hours a day. Inspector Generals have been cautioned to quiz soldiers and to examine carefully unit personnel records to detect disparateness in classification and duty assignments. When you have the whole picture before you at all times such differences are easily detected and may be promptly remedied. You can also determine at a glance what personnel are assigned to each flight and headquarters, who is on furlough, who is sick, who is attached, AWOL, and what have you. Particularly is this helpful for flying commanding officers who must devote smaller periods to the study of administrative and personnel problems.

Construction of a squadron board is not difficult. One such as that used by our squadron and pictured on the preceding page can be built by the unit carpenter in no time. It pays dividends. And keeping it up-to-date is easy. Just have the clerk face the board with the report of change cards in one hand and with his other hand free to switch the cards accordingly. And there you have

the morning report etched before your eyes.

IV) *Higher Echelon Devices*—Group and wing have created helpful personnel devices which are refinements of the basic forms. All of these aid in streamlining the personnel setup and help to project the intricate organizational process in camera form for higher echelon purposes. Where this is overdone there results needless duplication and overburdening in lower echelons.

In the last analysis, regardless of the various techniques available, the secret of personnel success rests in the efficiency of the basic unit, the squadron. And in that connection a number of "don'ts" and "do's" are in order:

1) *Don't* treat human material lightly just because there seems to be plenty of it around.

2) *Don't* misuse the power of transfer and separation because a soldier lacks the expected qualities necessary to perform his immediate duty. There is great salvage value in human material.

3) *Don't*, on the other hand, retain highly undesirable individuals where they reveal gross limitations in the performance of any duty. Loyalty is no substitute for competence.

4) *Don't* label a man as incompetent because of a low AGCT score. He might have been full of typhoid and tetanus vaccine and have lacked sleep when he acquired that brand.

5) *Don't* withhold opportunity from a man when he can better himself. No one is irreplaceable—and the Army Air Forces nearly always benefits.

6) *Do* put the power of classification and reclassification in the hands of an officer trained for that purpose. Haphazard use of these techniques results in waste and inefficiency.

7) *Do* strive to upgrade personnel. Retention of capable men in "lower" skills is detrimental.

8) *Do* take full advantage of the Army Air Forces technical training program. Education brings out the best in your men. But avoid careless selection of students. Some men are simply not cut out for school.

9) *Do* promote men as rapidly as they deserve. There is no formula for promotion; it varies with the individual. However, it is a good rule to provide some measure of promotion incentive at all times.

10) *Do* maintain the reporting system up-to-date. The Army Air Forces is such a vast organization and is growing so rapidly that inefficient reporting causes "bugs" in the personnel setup.

Far be it from these to serve as the Army Air Forces' personnel "Ten Commandments". The number of "don'ts" and "do's" is endless, proving that personnel is as complex a problem as the human being. (And the ability to understand the human being is basic for the comprehension of the vast problems of personnel.) But the problems of personnel are of prime importance, for in manpower, properly equipped, lies the key to an efficient combat force and to ultimate victory. ☆

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REMEMBER: You can get maximum coverage **WITHOUT A PHYSICAL EXAMINATION OR PROOF OF INSURABILITY** if you act by August 10, 1943. **DO IT NOW!**

TO THE OFFICERS AND MEN OF THE ARMY
In order to furnish maximum protection for members of the Army and their dependents, the Congress provided National Service Life Insurance. It is to the personal advantage of every officer and man to have this protection. The cost is small, and with present pay rates every soldier should be able to carry the maximum amount authorized.

—Henry L. Stimson, Secretary of War.

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- ... If 30 years of age, a monthly income for life of 39.70
- ... If 40 years of age, a monthly income for life of 45.00
- ... If 50 years of age, a monthly income for life of 53.90
- ... If 60 years of age, a monthly income for life of 68.10
- ... Increased benefits for higher ages.

Payments to beneficiaries of ages not shown in above table would vary in proportion to age.

National Service Life Insurance costs the serviceman less than any other kind of insurance. Monthly premium rates for a \$10,000 policy are as follows:

Age	Rate	Age	Rate	Age	Rate
18	6.40	29	7.00	40	8.50
19	6.50	30	7.10	41	8.70
20	6.50	31	7.20	42	8.90
21	6.50	32	7.30	43	9.20
22	6.60	33	7.40	44	9.50
23	6.60	34	7.50	45	9.90
24	6.70	35	7.60	46	10.30
25	6.70	36	7.70	47	10.80
26	6.80	37	7.90	48	11.40
27	6.90	38	8.10	49	12.00
28	6.90	39	8.30	50	12.70

**SEE
YOUR
SQUADRON
C.O.
TODAY**

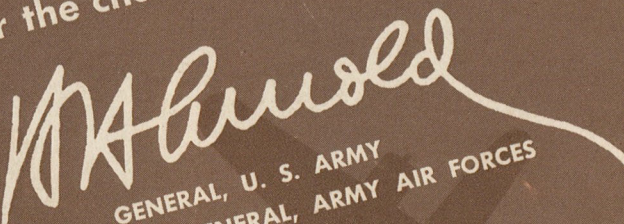
OUR COMBAT SPIRIT

The outstanding impression gained during my visit to the African, Middle East, and Far Eastern Theatres was that every young officer and enlisted combat crew member had the utmost confidence in himself, in his fellows, and in the equipment he was using so effectively.

Every Army Air Forces man preparing for combat should gain increased inspiration from the supreme confidence and fighting spirit of our comrades overseas.

Those who have fought the enemy have no doubt as to the outcome of this war. Combat crew members know they can meet any enemy on equal terms. They praise their equipment and would not exchange types of airplanes. Their intense loyalty and mutual confidence is everywhere apparent.

I proudly commend the glorious combat spirit of Air Forces fighting men overseas. Their admirable example should inspire every officer and enlisted man to new zeal and greater enthusiasm for the challenging task ahead.


GENERAL, U. S. ARMY
COMMANDING GENERAL, ARMY AIR FORCES