



AIR FORCES NEWS LETTER

JUNE 1942



Army paratroops in maneuvers

AIR FORCES NEWS LETTER

PUBLIC RELATIONS DIVISION, PUBLICATIONS SECTION
ARMY AIR FORCES, WASHINGTON, D. C.

VOL. 25

JUNE, 1942

NO. 4



CROSS COUNTRY.	1
THE FERRYING COMMAND -- By Brig. Gen. Harold L. George	3
HONOR ROLL	7
FLY TO TOKYO--ALL EXPENSES PAID -- By Oliver H. Townsend	9
AIRDROMES IN WARTIME -- By Lt. Col. Rudolph E. Smyser.	11
PRO PATRIA MORI.	13
YOUR SAFETY JOB -- By Maj. W.R. Weber.	14
AAF PLANES TORPEDO JAPS.	15
THEY LOOK FOR TROUBLE -- By Lieut. Robert B. Hotz.	16
SWEEPS OVER FRANCE -- By Flight Lieut. Brendan Finucane.	21
CONFESSIONS OF A VETERAN PILOT -- By Capt. W.V. Brown.	23
CHANUTE'S FAVORITE SON -- By Maj. M.F. Ranney.	26
MAXIMUM AIRCRAFT SPEED -- By Lieut. Perry J. Ritchie	28
BOEING'S FLYING FORTRESS	29
TECHNIQUE.	32
RANDOLPH SPEEDS MECHANICS TRAINING	35
GERMANY'S MESSERSCHMITT.	37

Technical and Art Director—James T. Rawls

FRONT COVER

Women in uniform are making an unofficial but striking appearance in the Air Forces. Although not ordered by headquarters, commanding officers at several airfields are requiring uniforms for women clerical workers (all civilians) in the interests of increased efficiency and esprit de corps. Typical of these "uniformed girls" is Miss Kathleen Nelson, secretary to the Post Surgeon at the Air Forces Gunnery School at Tyndall Field, Fla. In the cover picture, Miss Nelson is shown wearing a uniform of "Air Force" blue and a cap bearing the insignia of the branch to which she is assigned.

PHOTO SOURCES

Life Magazine, inside front cover, p.11, 22; Glenn L. Martin Aircraft Co., p.15; Lockheed Aircraft Corp., p.16; Boeing Aircraft Co., p.29; and U.S. Army Air Forces photos.



We'll Be Back

A LOT CAN'T BE SAID RIGHT NOW ABOUT THE DETAILS OF THE APRIL VISIT TO JAPAN. BUT THERE IS ONE QUESTION I CAN TALK ABOUT-- WHO DROPPED THE FIRST BOMB ON TOKYO. MY ANSWER IS THAT I DON'T KNOW; NOBODY KNOWS. WE STRUCK IN A MASS ATTACK, AS PLANNED.

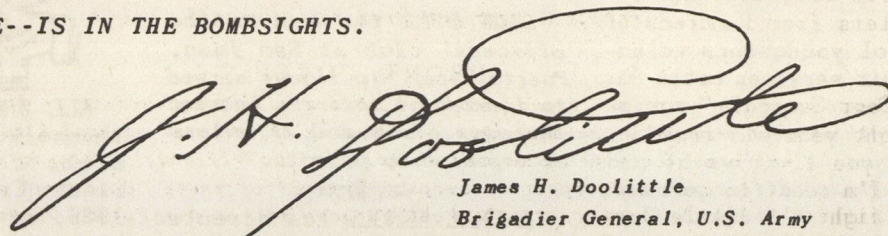
THE FIRST BOMB REALLY ISN'T IMPORTANT. WE WILL DELIVER TONS AND TONS OF BOMBS TO JAPAN. TOKYO WAS ONLY THE BEGINNING. THAT FIRST RAID WAS JUST A TASTE OF WHAT'S TO COME

BY THEMSELVES, BOMBS AND MEN LOSE THEIR IDENTITY IN THE MAJOR TASK. IT TAKES A LOT OF MEN, A LOT OF PLANES, A LOT OF BOMBS. IT TAKES HARD WORK AND CAREFUL PLANNING.

WE PLANNED LONG AND HARD FOR THAT FIRST MISSION. IT WAS NO HIT OR MISS AFFAIR. EACH MAN HAD A SPECIAL TASK; EACH CARRIED HIS TASK OUT TO THE LETTER. EVERYTHING CLICKED. THAT GROUP OF YOUNG MEN WHO PARTICIPATED IN THE EXPEDITION WAS THE FINEST I'VE EVER HAD THE PLEASURE TO SERVE WITH.

SOME OF THE BOYS WHO TRAINED FOR THE PARTY COULDN'T BE TAKEN ALONG, BUT THEY WERE JUST AS IMPORTANT AS THE REST OF US. WE'RE ALL TOGETHER IN THIS WAR--AIR CREWS, GROUND MEN, FACTORY WORKERS. AND DON'T FORGET THE BOYS WITHOUT THE MOTORS--THE GLIDER PILOTS. THEY WILL BE THE SPEARHEAD OF FUTURE AIR-BORNE ATTACKS.

I'M SORRY ALL OF YOU COULDN'T HAVE BEEN WITH US. WE DELIVERED YOUR CALLING CARDS. THE REAL MESSAGE IS YET TO COME. WE'LL BE BACK. WORK AND TRAIN AS IF TOKYO WERE ALWAYS BELOW. YOU'LL WANT TO PRODUCE THE GOODS FOR THE DAY THE TARGET--NO MATTER WHAT IT MAY BE--IS IN THE BOMBSIGHTS.

A large, stylized handwritten signature in dark ink, reading "J. H. Doolittle". The signature is fluid and cursive, with a large loop at the end of the last name.

James H. Doolittle
Brigadier General, U.S. Army

Cross

Country

THE WAR'S first raid on Japan was a hedge-hopping raid. Before and after the bombs were released, Air Forces flyers skimmed along as low as 10 feet from the ground to make sure that Jap fighters and anti-aircraft guns didn't interfere with the business at hand. One of the B-25s actually flew under a power line, just missing a pole, and dipped its wings under the branch of a tree. Some of the planes breezed so low over the



water that propeller blasts kicked up waves; wings were raised to avoid the masts of fishing boats. Japanese boys threw stones at bombers zipping low over one of the beaches. As they approached their objectives, crew members were able to detect the facial expressions of the natives and watch the Japanese wave up at them, some waving handkerchiefs, apparently ignorant of what was going on. After the bombs had fallen, the natives again raised their arms to the bombers—but only to shake their fists.

AS A RESULT of the Japanese raid, General Doolittle has received letters from hundreds of grade school youngsters volunteering their services to the Air Forces. "Dear General," scribbled an eight year old from St. Louis, "if you'll drive by and pick me up I'm ready to go right now. I'll fight the little Japs while you fight the big ones." The boy received an autographed picture of the General and his advice to stay in school and get an education "so when we want you you'll be ready."

A PRIVATE at Foster Field, Tex., with a week-end leave coming up wanted nothing more than to visit his home in Chicago. His buddies on the ground line rose to the occasion. We've arranged for you to fly home in a Type C-3 trainer, they told him, and he jubilantly prepared for the trip. Not until he was ready to board the plane did they explain that a Type C-3 is a Link Trainer.

OFFICERS back from combat duty in the Far East warn against underestimating the Jap pilot, whom they describe as a well trained, clever flyer. His pursuit technique is rated as excellent. In bombing attacks he and his companions usually stick together like glue, often remaining in formation even after their ships have caught fire. His aggressiveness is linked closely to numerical superiority; the Jap is cautious when the fight is on even terms. He plans an attack carefully and executes it to the letter, although in some instances his failure to improvise has proved costly. He invariably refuses to close with B-17 gunners—and for good reason.

SIGN OVER the bar in the officers' club at San Juan, Puerto Rico; "No liquor served to lieutenant colonels between the ages of 18 and 21 unless accompanied by parents."

GENERAL ARNOLD has directed that all qualified enlisted men of the Air Forces be given the opportunity to train as Aviation Cadets. "Each unit and activity," he states, "must be prepared to lose any highly quali-

fied man for Aviation Cadet appointment at any time. Such men must not only be recommended, should they apply; they must be encouraged to apply. Where an enlisted applicant for Aviation Cadet appointment is disqualified therefor, he will be informed of the opportunities and advantages of the Army Air Forces Officers Candidate School."

AT A WESTERN field, so the story goes, a Cadet circled his AT-6A for a landing. "O.K.?", he queried. "Not quite," replied Control Tower, "not until you lower your landing gear." But the Cadet was silent. "Lower your gear! Lower your gear!" Control Tower was by now mildly upset. Still no answer. And the Cadet came in, landed on an empty belly, messy, but safe. "How do you explain landing gear up after repeated warnings?," demanded the Operations Officer, "how do you explain your refusal to answer Control Tower?" "Sir," mumbled the Cadet, "it was the fault of that buzzer in my ship. I never heard Control Tower. That buzzer got louder the more I eased back on the throttle. It was so noisy I couldn't pick up a thing on my radio."



ALL WHO are ready to stamp themselves as incurable Dodos might consider the case of Lieut. Travis Hoover. Back in 1939, as he neared the end of his primary flight instruction at Lindbergh Field, Calif., Lieut. Hoover jotted down such serious words as these: "After about 11 hours of dual, it seems as if my progress has reached a

standstill, and I am very concerned. Will I be 'washed out' if I don't snap out of it pretty soon? Why can't I master the one thing I want to do more than anything else—be able to fly and fly well for Uncle Sam." A glance at the Honor Roll list on page seven shows that Lieut. Hoover has just been awarded the Distinguished Service Cross for piloting one of the B-25s that staged the war's first raid on Tokyo.



YOUNG AIR FORCES flyers who bombed and torpedoed the Jap fleet off Midway Island were asked how it felt to plunge into combat for the first time. Some of the answers: "You don't get thrilled, exactly; you have to concentrate too much on what you've got to do..... Scared? I suppose so, at first, but I got mad right away.....I forget how I felt; with the target below and the Zeros alongside there really isn't time to feel..... It just felt good, that's all; we'd been waiting for this."



ONLY FOUR Americans hold international Golden "C" soaring certificates, highest soaring recognition granted, and three of them are with the Air Forces. Major Lewin B. Barringer is on duty at headquarters as a glider specialist; 2nd Lieut. Chester Decker is with the Glider Unit at Wright Field, and John Robinson is a civilian instructor at the Twenty-Nine Palms (Calif.) glider school. The fourth Golden "C" holder, Robert M. Stanley, is chief test pilot at Bell Aircraft Corp.



THE GLIDER PILOT program, by the way, is one of the fastest moving activities in the Air Forces. Some recent developments: Prior flight experience is no longer necessary to qualify for glider pilot training, which has been made



available to all officers, enlisted men and civilians between the ages of 18 and 36 who can meet physical and mental requirements....Selected graduates of the glider schools will be appointed second lieutenants, others will be given staff, sergeant ratings with flight pay, and all graduates will be authorized to wear glider pilot wings insignia.



ON A RECENT night training flight Aviation Cadet William Waters found himself over a small Carolina town with his gas supply almost exhausted. He recalled how another Cadet in a similar spot had dipped and circled over a small town until he aroused citizens, who quickly drove their cars to a local airfield and flooded it with their headlights for the forced landing. So Cadet Waters circled and dipped. Finally he saw headlights shining on a nearby field. Waters came in—and ground looped smack in the middle of a freshly plowed cornfield. The natives, it seems, hadn't stopped to light up a landing field. They had merely applied their car brakes out of curiosity to get a better view of what was going on up above.



THE THIRD Air Force is due for most of the action in summer maneuvers; from July 26 to August 16 and from August 31 to September 20 in the Carolinas, from August 31 to September 20 in Louisiana, and from October 5 to 25 in Tennessee. The First Air Force will be at the Carolina maneuvers from October 5 to 25.

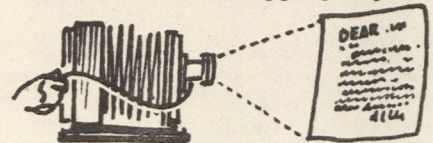


TWO LIEUTENANTS at Fort Belvoir, Va., where the Engineer Board is training officers in the gentle art of camouflage, find themselves in a rather enviable spot. They

are First Lieutenants Herbert Licht, a former landscape architect, and Sam Rittenhouse, a former civil engineer. These two boss a sweating group in clearing fields, cutting down trees, razing stumps, and building and hauling dummy planes—all in a day's work at the camouflage course. Receiving instructions from Licht and Rittenhouse are lieutenant colonels, majors and captains, and the teachers show their superior officers no partiality. What's more, the ranking officers take it and like it, or pretend they like it.



AIR FORCES personnel who participate in submarine sinkings will get the Air Medal. The boys on off-shore patrol know that sub hunting is tough. It is estimated, for instance, that in two out of three cases a submarine will sight a plane and dive before the plane sights the sub. Also, that a submarine on surface during daylight can submerge approximately 25 seconds after spying a plane.



NOTES: "V Mail" — letters photographed on special film, flown to America and reproduced for delivery here—has been made available to all personnel of our armed forces in the British Isles, so we hear. It is reported that a ton of letters can be recorded on negatives weighing only 25 pounds....The average soldier in field uniform, according to the War Department physical training manual, should be able to run 100 yards in 13 seconds, high jump four feet, broad jump 13 feet 6 inches and do 25 push-ups from the ground....Corporal Franklin Leve of Maxwell Field won a national contest to find an American name for the armored divisions. His prize winner: "Armoraider".... At last count, 78 band units had been formed within the Air Forces.

—The Editor

The Ferrying Command

By Brig. Gen. Harold L. George

Commanding General, Air Forces Ferrying Command



THE present war differs from all previous conflicts in its truly global character and the pre-eminence of air power. Operations of the opposing forces embrace the six continents, four oceans and seven seas in their daily communiques. Despite the magnitude of the forces involved on land and sea, air power has emerged as the key to victory.

In a war of this character, battle lines are stretched around the world. Here at home, we are building up the arsenal of Democracy to supply them. The link between is the vital service of supply. And as operations on the battlefronts have been speeded up by the rising factor of air power, the service of supply must take to the air to keep pace.

The Air Forces Ferrying Command functions to translate factory production into combat air units along the ever shifting theatres of operation. We might describe the Command as an aerial service of supply.

December 7 left the Command with the responsibility of delivering all military aircraft to be produced under the President's program of 60,000 planes in 1942, 125,000 in 1943. Since that date the Command has plunged headlong into other vital aspects of war--aerial delivery of equipment and personnel.

In accomplishing its huge job truly prodigious feats of daring and skill are being performed by the Ferrying Command. New routes have been blazed above the Arctic Circle and below the Equator. With few detailed maps and haphazard weather information, planes have been flown around the world.

A globe circling series of bases have had to be established and a special network of communications set up to provide the daily information without which regular operations could not be maintained. Equipment ranging from blankets and strawberry jam to prefabricated houses had to be brought in by ship and plane. With native labor to which modern construction methods meant nothing, landing fields had to be enlarged and runways extended.

The War Department has announced that our pilots recently evacuated more than 4,000 persons from Burma. The Command also played an important role in the Battle of the Philippines. Even after the fall of Bataan our planes made two hazardous trips to the Philippines. On the first trip 25 persons were evacuated. On the second, just before Corrigedor fell, 30 evacuees were flown out on a plane carrying a total of 37 men, packed in like sardines. The navigator

practically had to stand on three of the passengers to take his fixes.

Not long ago the Command was notified that several thousand pounds of essential military supplies were needed as soon as possible at a base in eastern Australia. Two days and 14 hours after these supplies were made available to us on the coast, we had them delivered in Australia. During this flight the crew spent only seven hours on the ground, all for servicing. Meals and snatches of sleep were caught in flight.

When a badly needed military hospital burned to the ground in a remote section of Alaska, the Command was notified. Thirty-six hours later a 24-bed emergency hospital was set up and in operation with materials and supplies ferried by the Command.

Pilots and crews have experienced difficulties of all kinds and descriptions--ice in the Arctic, storms and St. Elmo's fire that burned holes in wings and fuselage in the South Atlantic, Japanese planes in the Far East.

The exploits of our airmen breathe life into the formalized phrases of official citations made for "extraordinary achievement", and give new meaning to the stereotyped wording; "not only reflects credit upon himself, but upon his organization, all of the Army Air Forces and his country as well."

Landing at a foreign airport surrounded by barrage balloons with the ceiling zero is such an exploit. Flying at 22,000 feet over a cloud bank for hours until the oxygen supply was nearly exhausted is another. Bringing in a plane safely over a northern route after an encounter with a cold bank that within a few minutes deposited more than a ton of ice on the wings is a third.

There is the crew of a plane which took off from Java during the early days of the war to bring out the ground crews of a bomber squadron withdrawn from the Philippines. With enough gasoline for only 2,000 miles, the plane successfully completed an 1,800 mile flight at night through hostile territory, changing course five times with only the stars as a guide, so that the slightest miscalculation would have meant failure, with death or capture by the enemy their probable fate. The thrill that ran through the crew can only be imagined as their signal for a landing was answered by a flare from the utter blackness below. But the ground crews so badly needed in Java were brought out

"according to plan".

At one base in Africa, the crew brought in a four-motored plane without any advance communication with a field because the radio station was closed and the operator was away attending a festival.

Establishment of our foreign routes raised many new problems, all complicated by the factor of distance. Sanitation in many places simply did not exist. Anti-toxins merely helped in the battle of prevention. The whole question of food for such diverse climates as those of Greenland and mid-Africa, India and China had to be examined. Seeds are now being sent out to detachments in far-off places so our men will have the familiar taste of home-grown carrots, lima beans, onions and pumpkins to assuage homesickness as well as hunger. Frostbite and mosquitoes are only two of the myriad enemies it is necessary to guard against in order to keep the officers and men maintaining our bases in the health and spirits vital to continuous operations. Refrigerators, radios, phonographs, baseball, badminton and other athletic equipment have been enlisted in the cause.

Some of these difficulties are on the lighter side. Ferrying one type of pursuit ship means limiting baggage to a toothbrush and razor. With crews constantly on the move, laundry still is a chronic problem. There is the case of the pilot whose fiancée spent almost three weeks waiting at the airport before he could stop long enough to get a marriage license and have the ceremony performed.

Yet, while daily problems were being solved, an eye had to be kept to the future when the full stream of production would be flowing over the airplanes to American squadrons and to our allies' forces everywhere.

Without the aid of existing commercial companies in a score or more fields, this gigantic task could not have been successfully accomplished. Airlines, oil companies, manufacturers and scores of individuals volunteered their services. They are still helping to perform vital functions in a setup that already has exceeded in scope the operations of all the civil airlines in the United States combined, and that in the near future will surpass those of the entire world.

Miraculous as some of the accomplishments of the Ferrying Command have seemed in the past, more miracles must be performed in the future before the war in the air can be won. There can be no resting on laurels, no pausing for breath until we deliver the bomber that levels the last Axis base to the ground.

Fortunately for us, the Ferrying Command had the benefit of a relatively natural growth, although the nature of its work has made pioneering the rule rather than the exception. Created in June, 1941, by direction of President Roosevelt to speed up aircraft deliveries to the British under the Lease-Lend Act, its task was later extended by international developments to include deliveries to such other Lease-Lend ben-

eficiaries as the Union of Socialist Soviet Republics, the Netherlands East Indies, China and other South American countries.

Starting with an original complement of two officers and one civilian secretary, the Ferrying Command has grown within 10 crowded months into an organization of several thousand officers, enlisted men and civilian employees. From the beginning, questions arose for which precedent could furnish no answer because there were no precedents.

The organization which has been evolved to carry out President Roosevelt's program follows traditional lines in many respects, yet allows for infinite variations. It consists in broad outline of a Headquarters, and a Domestic and a Foreign Wing. The Domestic Wing ferries all military aircraft from factories to points within the continental limits of the United States. At the East and West Coasts, planes consigned to foreign nations are turned over to the Foreign Wing, which flies them across to fronts in the Near and Far East, Australia and the U.S.S.R. I well remember the time when our thinking was confined to Hemisphere defense. Today we speak of countries as a few years ago we spoke of states, speak of oceans and seas as once we talked of rivers and bays.

A natural by-product of this vast organization is the training program, only recently instituted, to keep our pilot strength ample for the task of ferrying thousands of airplanes a month, varying in size from the small "grasshopper" craft used for artillery spotting and ground liaison to the huge Consolidated B-24s and Boeing Flying Fortresses.

Before the attack on Pearl Harbor, almost all our pilots were military flyers. The sudden demand for their services with combat units led to employment of civilian pilots on civil service status. Plans call for eventually militarizing the entire service by commissioning these civilians as soon as they can qualify. The Domestic Wing already has set up officer candidate courses at control centers throughout the country to give intensive training designed to fit these civilian ferry pilots for commissions in accordance with their age and experience. These courses are conducted during the 90-day civil service appointment so that ferrying operations are interrupted only for a short period and by small groups at each sector.

The whole Ferrying Command establishment, as a matter of fact, has a training as well as an operational function. Pilots with lesser amounts of flying time start out on smaller types of planes, progress to the faster and heavier types. After undergoing training at our 4-engine school pilots may be transferred to the Foreign Wing, where they fly bigger, faster craft on longer missions. From the Foreign Wing, they are available for transfer to combat units, where their experience and training is invaluable for long range bomber flights. To develop pilots and crews for the announced pro-

gram of 500 heavy bombers a month will challenge our best efforts.

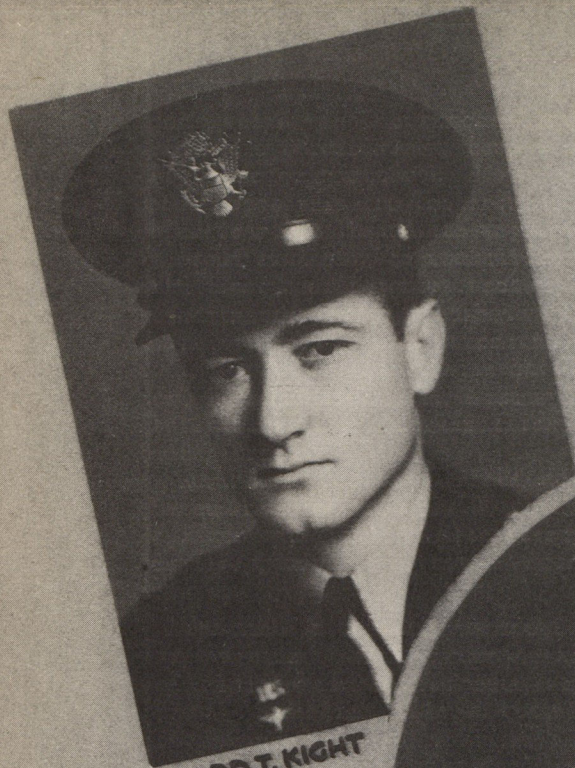
Conduct of operations on the present unprecedented scale has offered a new experience in organization. Since the Ferrying Command takes every military plane from the end of the assembly line, a sensitive finger must be kept on the pulse of production to eliminate any delays there. From our control centers, pilots and crews are sent to the factory to take over each plane accepted by the Materiel Command inspector and fly it to a particular destination. Their progress is plotted almost hourly along the route so that information is available immediately as to the location, route and condition of any plane at any time. When a plane is delivered, the crews are returned by air to their home control point or to another factory to repeat the process and keep the stream of produc-

tion flowing smoothly.

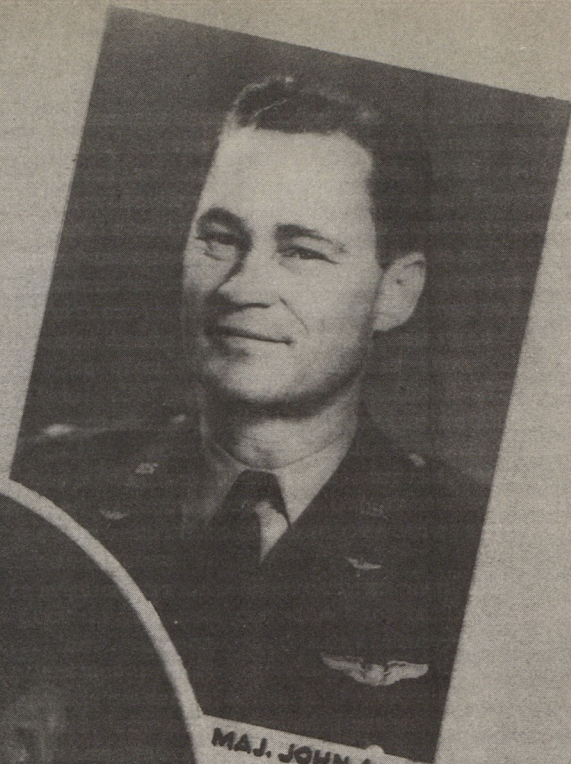
The Ferrying Command looks to the future with confidence. Ahead lies a task that a few years ago would have appeared insurmountable. Yet we are now delivering more planes each month than the Army Air Corps possessed a few years ago. At home the feeling that we are responsible in however small measure for the successful accomplishment of some war task should inspire us to greater efforts. On the battlefield, a sense of representing home and country, the millions of individuals making up this great nation, nerves our crews to fight the overwhelming loneliness of vast ocean or desert wastes, and steels the pilot, navigator, radioman, gunner and bombardier when the enemy is sighted. In this reciprocity of spirit will be forged the attainment of our common goal, "Winning the War".



Ferrying Command pilots inspect their open air dormitory at an African base. Nets are stretched over the beds for protection against insects. The surroundings may be primitive but the beds, springs and mattresses are the finest from the U.S.A.



CAPT. RICHARD T. NIGHT



MAJ. JOHN A. HILGER



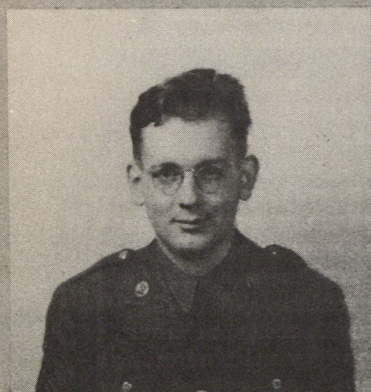
BRIG. GEN. J. H. DOOLITTLE



M. SGT. J. H. WALSH



LT. C. W. VAN EEUWEN



SGT. ERROL W. WYNKOOP



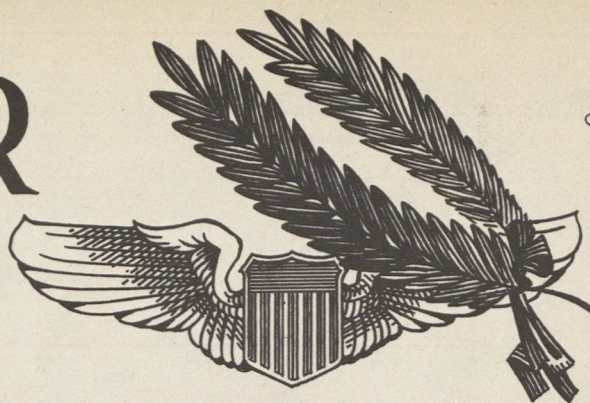
MAJ. GEN. LEWIS BRERETON



T. SGT. C. M. KINCHOLIE



HONOR ROLL



CONGRESSIONAL MEDAL OF HONOR

Brig. General James H. Doolittle---"*For conspicuous leadership above and beyond the call of duty, involving personal valor and intrepidity at an extreme hazard to life. With the apparent certainty of being forced to land in enemy territory or to perish at sea, Gen. Doolittle organized as well as led the air raid on Japan April 18, 1942.*"

DISTINGUISHED SERVICE CROSS

For participation in the Tokyo raid on April 18, 1942:

Majors

John A. Hilger

Captains

Charles R. Greening

David M. Jones

Edward J. York

Lieutenants

George Barr

Thomas C. Griffin

Robert J. Meder

Howard A. Sessler

Thadd H. Blanton

Dean E. Hallmark

Richard E. Miller

Jack A. Sims

William M. Bower

Nolan A. Herndon

Charles L. McClure

Donald G. Smith

Clayton J. Campbell

Robert L. Hite

Harry C. McCool

J. Royden Stork

Robert S. Clever

Everett W. Holstrom

E. E. McElroy

Denver N. Truelove

Richard E. Cole

Travis Hoover

Eugene McGurl

Harold F. Watson

Horace E. Crouch

Richard O. Joyce

Chase J. Neilson

Lucian N. Youngblood

Dean Davenport

Frank A. Kappeler

Charles J. Ozuk

Thomas R. White

Robert G. Emmens

Richard A. Knobloch

James M. Parker, Jr.

Rodney R. Wilder

William G. Farrow

Ted W. Lawson

Henry A. Potter

Carl N. Wildner

William N. Fitzhugh

J.H. Macia

William R. Pound, Jr.

Griffith P. Williams

Robert M. Gray

Jack E. Manch

Kenneth E. Reddy

Technical Sergeants

Waldo J. Bither

Eldred V. Scott

Staff Sergeants

Edwin B. Bain

Fred A. Braemer

Jacob Eierman

P. J. Leonard

William L. Birch

Omer A. Duquette

Edwin W. Horton, Jr.

Douglas V. Radney

Sergeants

Wayne M. Bissell

Aden E. Jones

Joseph W. Manske

Robert J. Stephens

Robert C. Bourgeois

Theodore H. Laban

Edward J. Saylor

Adam R. Williams

Melvin J. Gardner

George E. Larkin, Jr.

Harold A. Spatz

Corporals

Jacob DeShazer

Leland D. Faktor

Bert M. Jordan

David J. Thatcher

William J. Dieter

Donald E. Fitzmaurice

David M. Pohl

DISTINGUISHED FLYING CROSS

Major Jack N. Donohew.....*Heroism while piloting a plane near Kalama, Wash.*

Major Louis T. Reichers (Pilot)		
Capt. J.V. Chapman, Jr. (Co-pilot)		
Lt. J.A. Hutchins, Jr. (Posthumous)		
Master Sergt. C.G. Green		
Master Sergt. J.G. Moran		
Tech. Sergt. Francis G. Denery		

Capt. James J. Connally.....*Lead pilot of a flight of Flying Fortresses on bombing mission to Jolo, P.I., on Jan. 19.*

Capt. Richard T. Kight		
Lt. Kenneth L. Akins		
Lt. C.T. Allen (1st Navigator)		
Lt. John G. Moe (Navigator)		
Tech. Sergt. J.M. Cooper		
Tech. Sergt. H. Smith (2nd Engineer)		
Staff Sergt. Errol W. Wynkoop		<i>Hazardous and technically difficult round trip flight from Bolling Field to the Netherlands East Indies on an urgent and vital mission. Crew subjected to bombing raid at Palembang, Java, and later encountered a severe electrical storm during which the ship was struck by lightning and burned in several places.</i>

Major J.H. Rothrock (Co-pilot)		
Capt. David B. Lancaster, Jr.		
Capt. J.B. Montgomery		
Capt. William N. Vickers, Jr.		
Lt. Theodore J. Boselli		
Lt. Edson E. Kester		
Lt. F.B. Rang		
Lt. Elbert D. Reynolds		
Master Sergt. J.H. Walsh		
Tech. Sergt. Charles M. Kincheloe		
Tech. Sergt. Horace T. Peck		
Staff Sergt. R.J. Barrett, Jr.		
Sergt. Edward Schrempf		<i>Initial flights to the United Kingdom, opening North Atlantic routes for the Air Force Ferrying Command, Summer, 1941.</i>
Corp. Clyde W. Nowlin		

Sergt. Edward Schrempf
Corp. Clyde W. Nowlin

Lt. William B. Compton		
Lt. Cecil L. Faulkner		
Lt. Walter K. Heitzman		
Lt. Thomas C. Mustain		
Master Sergt. S.L. Jennings		
Sergt. Benjamin Clifton		
Corp. Jerome G. Parsons		
Pvt. 1st Class J.A. Capute		
Pvt. Robert Johns		

Lt. C.W. Van Eeuwan (Posthumous) (Pilot)		
Lt. J.J. Orr (Posthumous) (Co-pilot)		
Pvt. 1st Class J.W. Gallik (Posthumous) (Radio Operator)		
Pvt. 1st Class E.A. Onufrowicz (Posthumous) (Aerial Engineer)		
Aviation Cadet Earl W. Ray (Posthumous) (Navigator)		

Lt. Col. Caleb V. Haynes.....*2nd Oak Leaf Cluster--Flight to Britain*

Major Donald Keiser.....*Led Flying Fortresses across the Bay of Bengal to convert the docks of Rangoon into flaming wreckage, in spite of violent anti-aircraft and fighter opposition, and returned without a loss.*

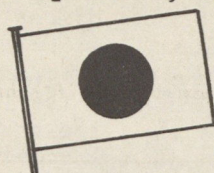
Capt. J.B. Montgomery.....*Co-pilot, round-the-world flight, September, 1941.*

(Continued on Page 20)

Fly to Tokyo--All Expenses Paid

BY Oliver H. Townsend

Headquarters, AAF



(This is the third in a series of articles describing countries officers and men of the Air Forces will visit in large numbers before the end of the war.--The Editor)

"COME to beautiful, hospitable Japan" is an invitation Japanese travel agencies have been bandying thoughtlessly about for years.

Doolittle finally did it.

With a party of 79 officers and men, Brig. General James H. Doolittle last month conducted a quick tour of Japan's chief industrial centers. Members of the party all report they had a wonderful time.

Although the famous Japanese hospitality was somewhat lacking when the Doolittle party arrived, the Tokyo radio has announced repeatedly that the Japs are "so sorry" they couldn't give him a much warmer reception. In all fairness to the hosts, it must be admitted that, once they knew the General had arrived, they tried their best to get him to stop over permanently. Members of the Jap air force are still brooding because they allowed him to "rush off".

After all, General Doolittle and his party did drop in somewhat unexpectedly. Perhaps that is why the Japanese hospitality was lacking. But he was simply following the precedent set by the Japs at Pearl Harbor—and he did leave calling cards.

All in all, the Doolittle junket was so successful that a new invitation, which has stolen the show from the Jap travel agencies, has been issued by the Air Forces.

A Better Offer

"Fly to Tokyo—All Expenses Paid" is the Air Forces offer, and it's a much more attractive one than any the Japs have made.

In response to this cordial invitation, thousands of Air Forces officers and men are thinking about making the trip to Tokyo. This being the case, it seems you all ought to know something about Japan; what preparations to make, how to get along with the natives, a little geography—that sort of thing.

To begin with, much of the success of your trip will depend on the plans you make before departure. General Doolittle and his party planned carefully. We suspect that his exact itinerary was laid out long before he left. This careful planning allowed him to visit every city on his list, and to devote particular attention to many points of special interest.

General Doolittle proved that although the Japanese Islands are somewhat isolated from the United States and its foreign bases, they are

still accessible if you make a stopover in friendly Shangri-La.

Americans who have made the flight to Japan all agree that the trip from Shangri-La to Tokyo shouldn't be missed. On the way you pass directly over the Rising Sun. Note the sun carefully as you fly over—it appears to be setting rather than rising. This phenomenon is puzzling Japanese scientists increasingly as time goes on.

Japan looms off the east coast of Asia like an undernourished barnacle on the hull of the Queen Mary. Although you may not be able to see them all in one trip, the Japanese Islands extend for 2,000 miles up and down the Asiatic coastline. If strung along the eastern coast of the U. S., the Jap Islands and Formosa would stretch from Cuba north to Labrador. Tokyo would fall in the vicinity of Norfolk, Va. Laid end to end, Japan reaches and reaches until honorable knuckles get cracked.

Bombardier's Paradise

Fortunately for the American traveler, most of the important points are concentrated in a 300-mile plain stretching from Tokyo south to Osaka on the Pacific side of the central island of Honshu. Crowded into this area are most of Japan's 70 million people, all of its greatest cities, and most of its agricultural and industrial wealth. You simply must not miss this part of Japan—especially if you are a bombardier.

The Doolittle party, despite a split-second schedule, covered most of the important points in this area. These included the Navy Yard south of Tokyo, where a new cruiser and a new battleship were given special attention; the Mitsubishi aircraft factory near Nagoya; a "tank farm" near Osaka; dock-yards at Kobe and Yokahama; and a number of steel works, oil refineries, armament plants and ammunition dumps.

Many tourist sights such as the Imperial Palace were ignored completely. Americans hope that the hospitable Japanese will not feel hurt because Doolittle left no presents for the Emperor. If they consider this to be a violation of their highly valued protocol, this oversight can be made up for in subsequent trips.

A good share of the Doolittle visit was conducted just above the tree-tops, offering a delightful view. One of the most interesting phenomena encountered was the terrain, especially over industrial and military areas, which looked much different to rear gunners than to bombardiers. Often ships and factories that were

plainly visible to the bombardiers had changed drastically by the time they came into the rear gunner's view.

Travelers to Japan should keep their radios tuned in--especially if they understand Japanese. Nippon's radio announcers will take a great interest in your arrival and quite probably become very excited about it. This may puzzle you somewhat, in that the Japanese usually pride themselves on their equanimity. But at least it will flatter your ego.

As you leave central Japan, as the snow-capped purple majesty of Mount Fujiyama fades into the distance, let your eye stray to the south. There, over the horizon stretch the islands of Shikoku and Kyushu, two of Japan's five largest islands. Kyushu, home of the ancient port of Nagasaki, is more than just the place where "the men chew tobacco and the women wicky wacky woo". It is also the second most important industrial area of Japan, and the place where most of its coal and iron is mined. It, like Tokyo, shouldn't be missed.

North from the central Jap island of Honshu lie Hokkaido and Sakhalin, and a number of smaller islands. Although you may not notice them all in your first few trips, there are over 500 islands in the Japanese archipelago, some as large as Great Britain, others smaller than Manhattan. Even so, their total area is no larger than the state of Montana--and three-fourths of that is covered by non-arable mountains.

This drives the people down onto the plains and makes big cities there--Tokyo, Osaka, Kyoto, Nagoya, and Kobe. Tokyo at the last count was almost as populous as New York, Osaka practically as big as Chicago. Tokyo's seaport, Yokohama, had almost a million people.

The Japanese people are fanatically proud of their military history. They have never been invaded. (Note to printer: stand by for possible change). Kublia Khan, conqueror of all Asia in the 13th century, tried it twice and failed. The rest of the world has never been given the chance--yet. Commodore Perry, however, did some "negotiating" under American naval guns in Jap waters in 1853 and 1854.

Before the Doolittle visit, the most spectacular debacle in Japanese history was the earthquake of 1923, which hit the Tokyo-Osaka area. Less careful than Doolittle, the earthquake destroyed thousands of homes, temples, and buildings and wiped out a large percentage of Japanese. In spite of this the Jap has retained his sense of humor. Admiral Yamamoto, for instance, recently announced he would dictate peace terms in the White House.

All in all, there is nothing like a trip to Japan to help one's disposition in these troublous times. After your first visit you will long for the day when you can return to these beautiful little jewels of the Pacific, bringing with you thousands of your friends, and showering the hospitable Japanese with tons and tons of special tokens of our esteem.



Pendleton, Oregon, where Doolittle's raiders trained, celebrates the bombing of Tokyo by "their boys"



A "dispersed" P-40, well-hidden from enemy view

Airdromes in Wartime

By Lieut. Col. Rudolph E. Smyser

Aviation Engineers



THE present war has demonstrated the military inadequacy of most peace-time airfields. Modern wars are not begun with the exchange of polite declaration of intentions; instead, without exception, the aggressor nation has commenced hostilities by a staggering attack on the air installations of its victim.

Although this formula has been repeated several times without variation, the results have been uniformly successful. There is no evidence that any of the victims learned except through their own bitter experience that airdromes can

be built for maximum efficiency for either peace or war, but not for both.

There are many different types of airfields but once the landing and take-off area is provided they are differentiated solely by the degree and the amount of servicing, maintenance, supply and administrative facilities provided. For military use, the following definitions apply:

Airdrome: A landing field at which military facilities for shelter, supply and repair of aircraft have been provided. This is the ge-

neric term for all military airfields.

Air Base: A command which comprises the installation and facilities required by and provided for the operation, maintenance, repair and supply of a specific Air Force. In its strict sense, the term Air Base can be applied only to an area. However, most existing military airfields in the United States are now called Air Bases because it is contemplated that, under operational use, they will provide supply and repair facilities for a large number of units concentrated in the vicinity on auxiliary airdromes.

Auxiliary Airdromes: An airfield located within an Air Base operated as an annex. It does not have all servicing, supply and repair facilities sufficient for its operation. This type of airfield is also called a satellite field.

Satellite Field: This term is of foreign derivation, and is applied to an occupied airdrome which is not completely equipped with the servicing, supply and repair facilities sufficient for its unaided operation. This type of airfield is identical in concept with an auxiliary airdrome.

Alternate Airdrome: An airfield available for the use of military units in lieu of the airdrome to which assigned.

Advanced Landing Field: An area of land near the general front available for the take-off and landing of aircraft. Minimum facilities for servicing only are available. Permanent occupancy by aircraft is not contemplated.

Staging Field: A landing and take-off area with minimum servicing, supply and shelter provided for the temporary occupancy of military aircraft during the course of movement from one airdrome to another.

Dispersed Airdromes: An airdrome in which the facilities for supply and repair of aircraft and shelter have been spread out and removed so far as possible from the immediate presence of the landing and take-off area.

Dispersal Parking Area: Areas of land in the vicinity of an airdrome not suited for landing and take-off of aircraft, which are used for the parking of aircraft. Dispersal parking areas may, or may not be contiguous with the normal landing and take-off areas, but are connected thereto by taxi tracks suitable for the use of any aircraft which may be parked in the dispersal parking area.

Field Airdrome: An airdrome, generally in the Theater of Operations, which is built for war-time use only. Construction at field airdromes is temporary, and the minimum consistent with military necessity, thus differentiating field airdromes from airdromes built during peace for permanent occupancy.

Too often, an airdrome is unsuited before it is ever built. Selection of the site in peacetime is frequently based on political expediency combined with economic necessity; the fundamental requirement for war time suitability is put

aside. Proper site selection is of course a compromise and adjustment between military necessity on one hand and flying requirements on the other.

Requirements Flexible

Fortunately, the military requirements are reasonably flexible, as it is more often necessary to locate an airdrome in a given area rather than in an exact location. Not only should sufficient land be available for the requisite landing and take-off area, but additional space must be available for the proper locating of technical installations, and for the parking of aircraft. It should be accepted as axiomatic that except when undergoing repairs, aircraft on the ground will be in dispersed locations. Airdromes are a logical target for the hostile air force, so every possible effort must be made to make the target inconspicuous and unremunerative.

Careful consideration should be given to the requirements of camouflage and dispersion. Sites should not be chosen which are easily found by relation to some prominent object which is clearly visible from the air. For example, placing an airdrome in the bend of a river would render camouflaging inoperative, as the river bend will always be visible from the air. The presence of woods, trees and hedges in the area are a great asset from the camouflage point of view, as these can later be reproduced on the completed airdrome by camouflage methods. In addition, they afford cover for dispersed aircraft, buildings, bomb dumps, gasoline storage and other elements.

The first requirement of an airdrome is an adequate landing and take-off area. This may vary from a level grass strip to an elaborate system of hard surface runways. Where soil and climatic conditions permit the growth and maintenance of firm turf surfaces, it may be possible to prepare a grass surfaced landing area from which light and limited traffic can operate during any season of the year, thus avoiding the necessity of preparing some form of hard surfaced landing area.

Advantages of Turf

The principal advantages of the turf field are that it can provide a runway facing into the wind at all times, and that it is more easily camouflaged since its surface approximates more closely that of the surrounding country. Generally speaking, all-over turf fields are particularly suited for training centers or even operational airdromes used exclusively by pursuit and light observation aircraft. Under the strain of heavy traffic, turf is likely to become rutted, especially if exposed to alternate freezing and thawing. Because of the mud which is inevitable during the wet season, maintenance

(Continued on Page 34)

"It is fitting and proper to die for one's country."

... PRO PATRIA MORI

A partial list of officers and men of the Army Air Forces officially reported to have died in the service of their country since December 7, 1941.

Major Generals

Herbert A. Dargue

Master Sergeants

Dave Jacobson

Colonels

George W. Ricker

First Sergeants

Wallace R. Martin

Majors

Austin A. Straubel

Chauncey B. Whitney

Technical Sergeants

Frank St. E. Posey

Raymond E. Powell

Joseph Ambrose

Howell H. Harris

Captains

Eugene D. Cadontseff

John L. Du Frane, Jr.

Colin P. Kelly

James Gordon Leavitt

Staff Sergeants

Doyle Kimmey

John H. Mann

John A. Price

Joseph C. Herbert

Paul B. Free

Elwood R. Gummerson

James M. Barksdale

Edward J. Burns

Lieutenants

Glen M. Alder

Paul Willard Anthony

William A. Anderson

Marshall Judson Anderson

Arthur Alfred Amron

Isadore Alfred

Thomas Francis Almon

N.W. Browne

William T. Biggers

Willis W. Burney

Walter C. Boyle

Glenn Harold Boes

Jerry Orville Brezina

Donald Paul Baker

James C. Barham

Hal Browne, Jr.

Homer Charles Burns

William Perry Brady

William A. Cocke, Jr.

Wilbur Camp

Jack W. Clark

Richard W. Cease

Robert E. Crouch

Ray Lawrence Cox

Woodrow Wilson Christian

Nathaniel Thomas Cornell

Hans C. Christiansen

Robert Devere Clark

Leonard William Carter

L.W.E. Duvall

William C. Daniel, III

Roy L. Drew

Willard Thurman Degolyer

Arthur Ferdinand Davies

James R. Davidson, III

Carl E. Danner, Jr.

John Joseph Doherty, Jr.

George Clark Denter

Frederick J. Dittman

Kenneth P. Donahue

John L. Dains

James Thomas Drake

John R. Van De Lester

Dennis Joseph Dowling

John Pershing Robbins

William S. Walker, Jr.

Elias Turner, Jr.

John G. Kelso

Maurice M. Miller

John A. Hutchins, Jr.

Arthur Edward Gary

Charles J. Young

George H. Olson

James W. Riddell

Lonnie B. Wimberley

Forrest M. Hobrecht

William R. Schick

William L. Northern, Jr.

Harry A. Sealey

Lycurgus W. Johnson

Foy Roberson, Jr.

Claude A. Knight

Samuel H. Marett

George R. Matthews

Karl F. Leabo

T.M. Richards

William E. Luetzow

James E. Snyder

E.D. Hoffman

R.A. Saner

John E. Loehrke

Robert T. Hanson

Louis A. Johnson

Roy Robertson

Sergeants

James H. Derthick

Lionel L. Lowe

George F. Loritz

Everett A. Pond

Russell V. Cornford

Stanley A. Donin

Corporals

Edward F. Heard

Kenneth O. Whitaker

Mack Sweeney

John Jurcsak

Paul H. Duncan

Gerald Dumais

Arthur E. Karlinger

Cecil R. Hamman

Donald F. Meagher

Antonio S. Tafoya

Privates First Class

Ralph S. Smith

Jerome J. Szematowicz

Robert R. Shattuck

William T. Rhodes

Willard C. Orr

Thomas F. Philipsky

William W. Merithew

Horace A. Messam

Harrell K. Mattox

William E. McAbee

Robert R. Kelley

James A. Horner

William E. Hasenfuss

Clarence E. Hoyt

Melvin J. Dodson

James E. Gossard, Jr.

Eugene B. Denson

William Coyne, Jr.

Privates

Alfred Hays

John J. Horan

Robert L. Hull

Robert H. Gooding

Leo E.A. Gagne

Lyle O. Edwards

Stuart H. Fiander

Willard E. Fairchild

Jack H. Feldman

Russell C. Defenbaugh

Robert C. Duff, Jr.

Malachy Cashen

Dean W. Ceibert

Robert S. Brown

Arthur F. Boyle

William J. Brownlee

Brooks J. Brubaker, Jr.

Gordon R. Bennett, Jr.

Robert G. Allen

Garland C. Anderson

Leland V. Beasley

Otto E. Wellman

Karl Santschi

Edward E. VanDyke

Your Safety Job

By Maj. W. R. Weber

Chief, Accident Prevention Division
Directorate of Flying Safety

GENERAL Arnold has called upon each member of the Army Air Forces to do all in his power to aid the accident prevention program of the Directorate of Flying Safety.

What can you do to help?

First of all, you can cooperate with the 10 special field safety officers who will represent the Directorate throughout the United States.

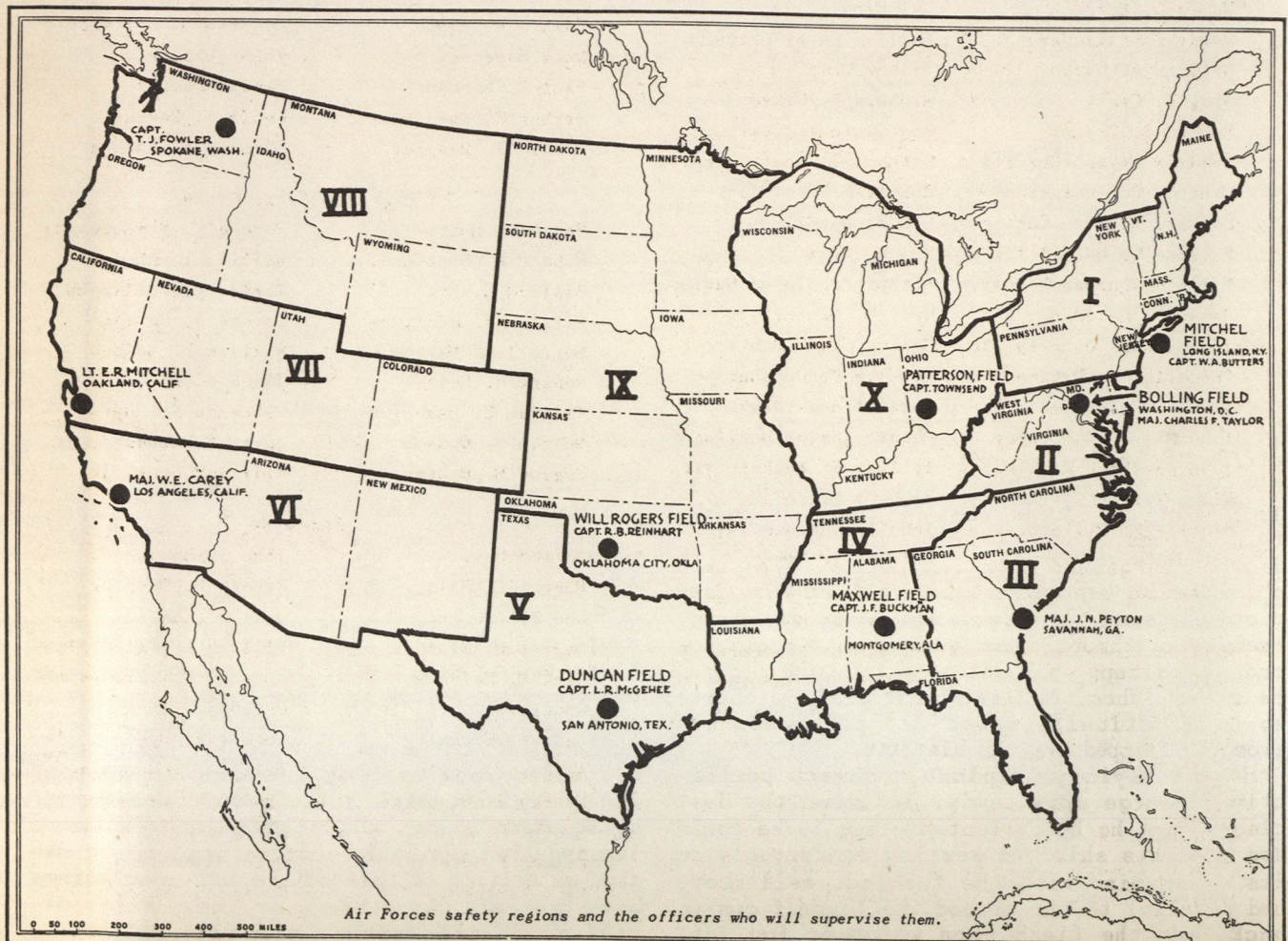
These safety officers—all experts—have been given the job of preventing airplane accidents. They will make special investigations and inspections, and will study the accident prevention devices used at individual fields. Most important of all, they will take every step necessary to see that all officers and men of the Air Forces know the rules of flying safety.

Help your safety officer. Cooperate with him. Learn the safety rules and practice them. Especially learn how to eliminate landing, taxiing and take-off accidents. There is no possible excuse for these.

A booklet soon to be published will describe the narrow escapes Air Forces flyers have had and how to avoid them. Many of you have demon-

strated a fine spirit of cooperation by contributing your own experiences to this booklet. Typical of the episodes described is the following, submitted by Lieut. Clay Tice, Jr., France Field, Canal Zone:

"We were on a shadow-gunnery mission making passes at the shadow of a two-ship element which was flying at an altitude of 500 feet. I started my dive at 1,000 feet and at about 100 yards from the target opened fire. I released the trigger after firing a burst of approximately 5 rounds but one of my guns continued firing. As there was another ship ahead and above me making his cross-over, I realized that following the pattern would endanger him. Glancing down in the cockpit I reached for the hydraulic button that controlled the malfunctioning gun and placed it in the lock-back position. It was but a split second before I had accomplished this but as I looked up again I was almost down in the water. I reacted without thinking and came back on the stick but my propeller hit the water throwing spray up over the cockpit. There was no damage done to the plane, but diving into the water at over 200 mph isn't something to look forward to. If I had kept my head in the cockpit an instant longer I would have crashed; but if I had known definitely where the gun control was located I would never have had such a narrow escape."

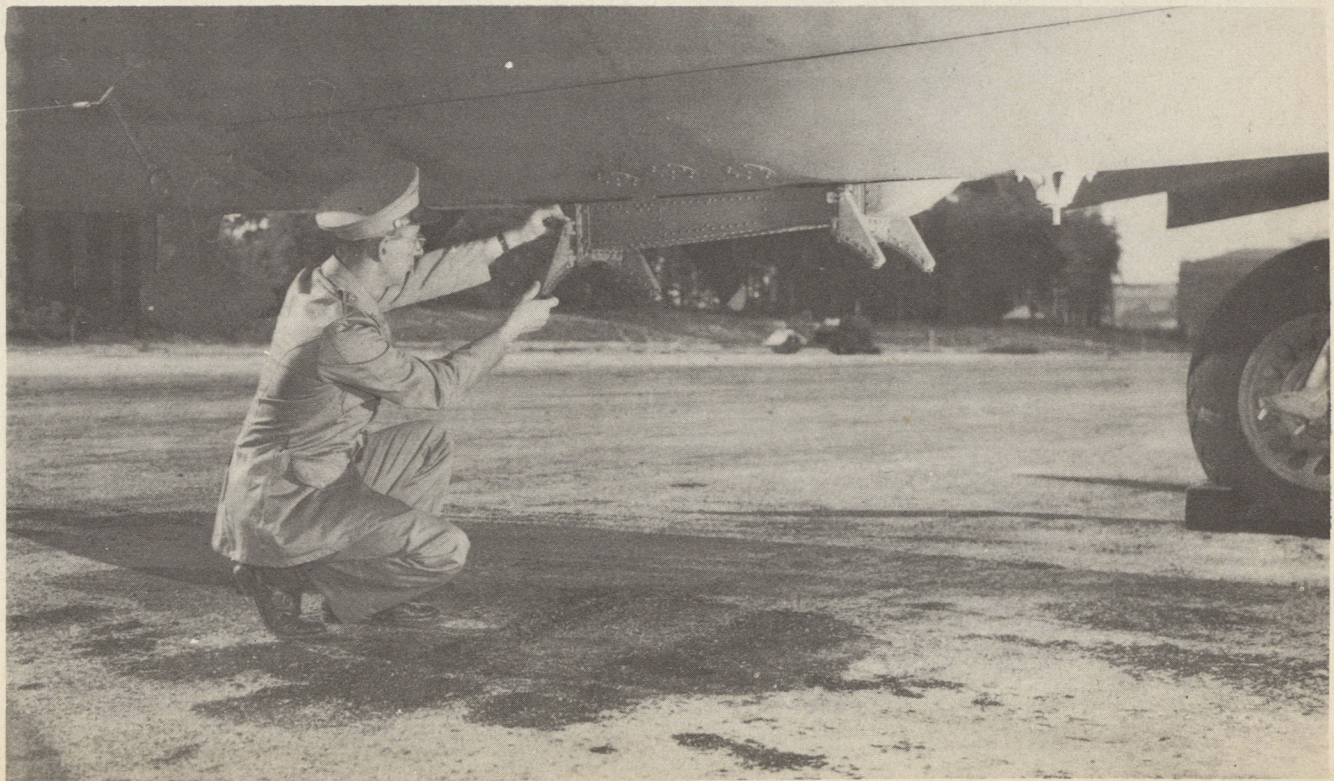
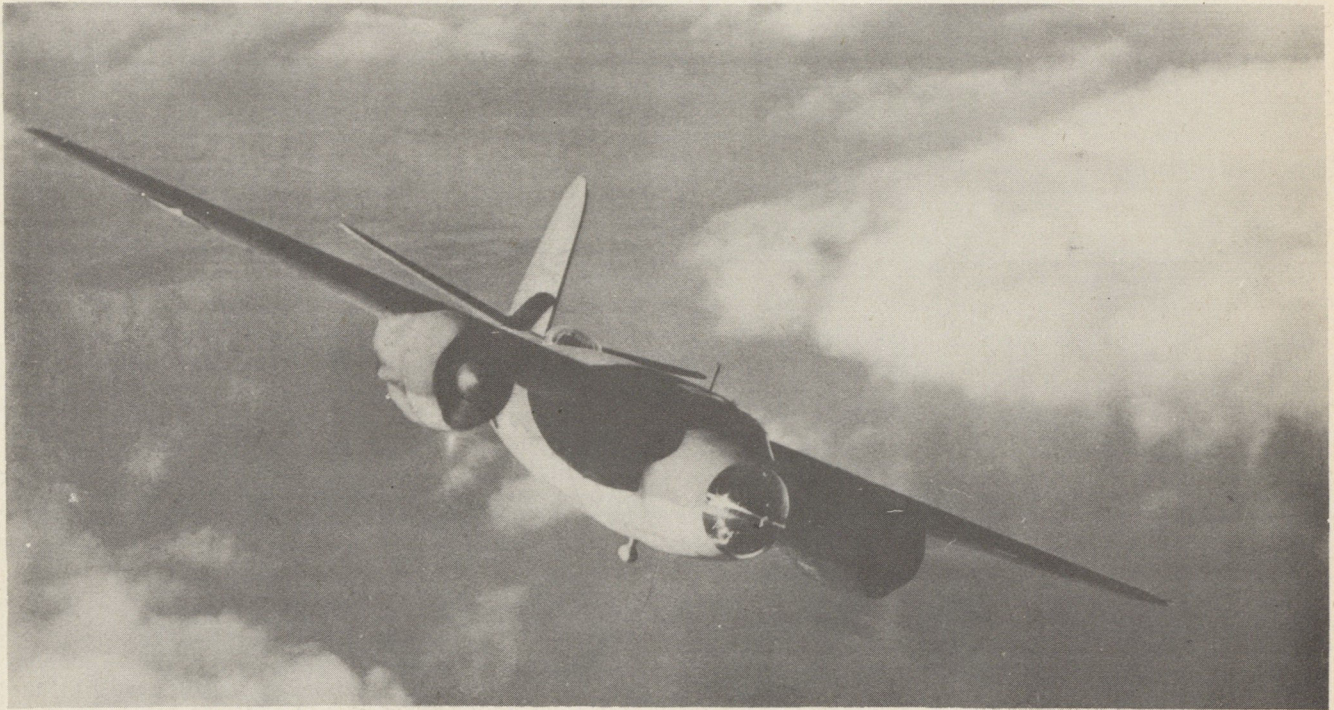


AAF Planes Torpedo Japs

OFF Midway Island the Jap Navy early this month ran smack into a new weapon of Army air power--and came off second best.

The new weapon was the Army's Martin B-26, equipped with a special torpedo carrying and release mechanism. Sweeping deck-high over the Jap fleet at lightning speeds the B-26s used the new device to send their explosive fish crashing into the hulls of carriers and warships. Together with Army B-17s and Navy carrier-based planes they sent the Japs limping home.

Sweeping out of the clouds in the picture at top is a B-26 medium bomber similar to those used to blast the Jap Navy with torpedoes. Below an Air Forces officer inspects the new torpedo release mechanism which made it all possible.



They Look For Trouble

By **Lieut. Robert B. Hotz**

Headquarters, AAF



Lockheed Test Pilot Milo Burcham climbs out of a P-38 after checking it in the stratosphere prior to delivery to the Army Air Forces.

Civilian pilots like Burcham work for all Air Forces contractors. It's their job to take airplanes aloft and look for all types of trouble before the planes are delivered to combat pilots.

THE sun beats down on the runways at the great Lockheed Air Terminal at Burbank, Calif. Scores of war-painted Hudsons, Venturas and P-38s are scattered over the field. A dusty station wagon bounces across the airport dropping a pair of casually dressed civilians before each of a long row of Hudsons and Venturas. The civilians buckle on chutes. Engines sputter, then roar. Twin engined bombers waddle across the grass toward the end of the runway. Lockheed test pilots are going to work.

These Lockheed pilots are an oddly assorted crew with only two things in common--a long and colorful record in the air and a love of the work they do.

There is Jimmy Mattern, who flew solo from New York to Siberia in 1933 and was lost for 14 days in the Arctic after a forced landing; Jim Allison, who fought in Spain and China; Lewis (Swede) Parker, who was a music student at Harvard when he learned to fly and who now mixes bronco-busting with his test piloting; Milo Burcham, famous in the barnstorming days for his one-wheel landings and upside down flying; several "old" KLM and French army pilots; the former legal counsel for Lockheed who learned to fly and left his law practice to become a test pilot; ex-butchers, ranchers and bartenders who learned to fly in the twenties and were forced into other occupations during the depression and returned to flying in the pre-war boom. All of them are veterans of more than 2,000 hours and 60 of the staff of 75 have more than 5,000 hours.

They are typical of the crews of factory test pilots seen lounging around the operations office of every big aircraft plant. The work they do is typical of that done by factory test pilots wherever planes for the Army Air Forces are made.

When an Air Force pilot gets a plane to fly he can be sure that there have been competent hands on the controls before him. In addition to the test flights by factory pilots, every AAF plane is given a final check by an Air Force acceptance pilot. Unless it is perfect in every detail it is not accepted. However, with a good crew of factory test pilots the work of an acceptance pilot is not too tough. The bulk of the job of seeing that AAF planes are fit to fly is done by the factory testers.

Lockheed test pilots like to talk about how simple their jobs are. And if you watched them play rummy in the pilot house awaiting call, flew with them while they checked a few "squawks" on a Hudson or rode along while they ferried a Ventura 40 miles to Long Beach, you might think they were right. But big Swede Parker and dapper Milo Burcham could tell you some scalp tingling tales of their experimental testing

of the original P-38 and there is a dusty set of maps in the pilot house drawer labelled "Ralph Virden". Virden was killed last year while testing an early P-38 and his name belongs on the airmen's honor roll in type as large as those of the pilots lost over Luzon and Java.

Another unsung hero of this routine battle for control of the blue is Marshal Headle, former chief test pilot of the Lockheed crew. Headle was the first man to fly the P-38 and became extremely interested in the effect on pilots of flying at the P-38's terrific ceiling. He used himself as a guinea pig in high altitude pressure chamber experiments. One day while trying to see how little oxygen a pilot could live on at well over 35,000 feet he became confused from lack of oxygen and cut off his oxygen supply instead of increasing it. The only alternative to certain death from oxygen starvation was for the engineers to increase the pressure in the chamber to that of sea level as fast as possible. It meant that Marshal Headle went through the effect of falling from that height to sea level in eight seconds. He may never fly again.

That is the kind of thing that happens when these test pilots push out along the fringes of the unknown. It is a dangerous and important part of their work but the bulk of their job is a bit more prosaic. It consists of putting planes fresh from the assembly line through routine checks, carefully noting and recording all irregularities in the "squawk book". Then on succeeding flights each squawk is checked until it has been eliminated and the plane is ready for delivery to the Air Forces.

In the days before the Ferrying Command, Lockheed had its own ferrying service and test pilots saw a good bit of the world delivering planes. Elmer McLeod, now chief test pilot, flew around the world delivering two Lockheed 12s to the Rajah of Jodphur. He lived in oriental splendor with the Rajah for two months while teaching him to fly. Other Lockheed pilots delivered Hudsons to South Africa and the Middle East via the South Atlantic and the Burbank-Montreal run functioned with the regularity of a commercial airline. But now a 40 mile hop to the Ferrying Command Base at Long Beach or an occasional trip to Dallas is their only cross country diversion.

Most of their time is spent wheeling the twin-engined Hudsons and Venturas over the ridges and valleys around Burbank and streaking P-38s up to their ceiling. Occasionally they give diners in the glass enclosed airport restaurant an infantryman's view of a P-38 in action by swooping down on the restaurant and pulling up in a terrific climb.

A test pilot making the first check on a Hudson or Ventura has a big green book in which he and the co-pilot record the performance of the ship. Before he takes it over, mechanics and inspectors give the ship a final check and

run-up. Then pilot and co-pilot make their own pre-flight inspection.

Once in the air the test continues in routine fashion. Test pilots don't "wring out" the ship in a test of this kind. All of the wing-pulling-off and slow rolling are confined to the original models. Once the design and construction has been proved in the experimental tests, production models are static tested for maximum strain on the ground so there is no need for test pilots to try to twist them out of shape.

The flight test starts out with a full power take-off and a rated power climb. Cowl flaps, oil scoops, RPM, fuel pressure, oil pressure and temperature, head temperature and manifold pressure are all recorded for both motors. The landing gear is lowered and raised in flight. Flaps are tested. Bomb doors are opened and closed and a short run is made on each gas tank to test the fuel feed system. De-icers are set to work and the plane is flown on the Sperry automatic pilot on four different courses. Trim tabs are checked, props feathered and unfeathered. Heaters and ventilators are checked and the cockpit inspected for air leaks. A pair of 360 degree turns are made in each direction and all instruments are checked. Props are used in low and high pitch and the landing gear warning horn is given a workout.

The book full of data is turned in with all irregularities noted. The next pilot who handles the ship after the mechanics have worked on the squawks will check off those remedied. The ship is flown until all squawks have been eliminated. Then it is ready for an AAF acceptance flight.

Most Hudsons average two hours of test flying; P-38s and Venturas usually get about three hours. With a pilot and co-pilot in the "office" of a Hudson or Ventura, keeping up the data book isn't too much trouble. But with a single pilot squeezed into a P-38 trying to fly one of the fastest ships in the world with one hand, while reading instruments, gauges and keeping in touch with the operations office by radio and recording squawks with the other, considerable dexterity is required.

The routine on P-38 testing is slightly different and the initial checking is broken up into two flights. On the first flight the rigging, flying characteristics, props, flaps, landing gear and radio are checked. The cockpit and instrument checks are done during the second flight. P-38s are also put through a special test at high altitude.

From 50 to 60 flights a day are made by the Lockheed test pilot staff of 75 and it takes a veteran to hold down one of these jobs. Yet, all of them still go to instrument and navigations school in the old Spanish ranch house on the edge of the airport. They put in regular hours on the Link and every once in a while they shoot a few instrument approaches to Montreal, just for old times sake.

THE AIR FORCES AM



AUSTRALIA (right)
Ground crew armorers at
base somewhere "down
under" preparing to load
a P-40 fighter.

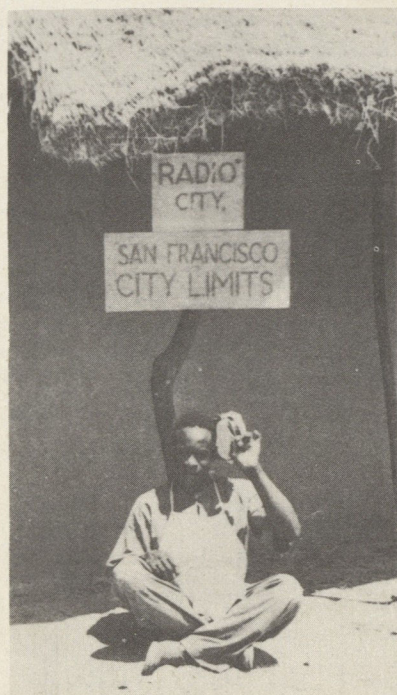
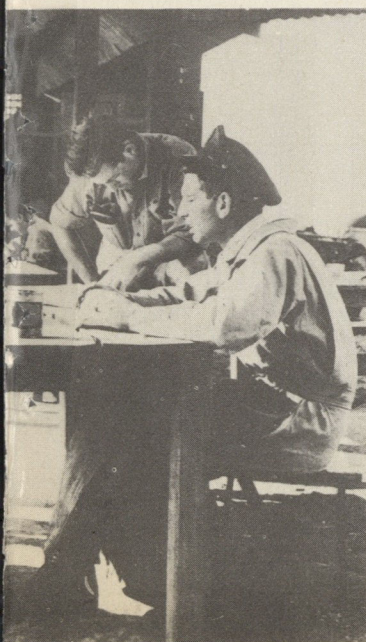


GUATEMALA (above). A covey of B-17's wing through a mountain pass on patrol duties in protection of the Americas and the vital Panama Canal. The planes are attached to the Caribbean Defense Command.

BURMA (below). AVG "Flying Tigers" and RAF personnel beside one of their shark-toothed P-40's at an advance airfield.



ROUND THE WORLD



AFRICA (above). A native lends color to the radio station at one of the Ferrying Command's airfields deep in the Dark Continent.

INDIA (left). Ferrying Command pilots are shown filling out their reports after delivering supplies and equipment.

HONOLULU (above). AAF fliers exhibit the name-plate of their B-26—all that was worth salvaging after they brought it back from the air-sea battle for Midway.

AUSTRALIA (below). Bomber Pilot R. B. Prouty gives final instructions to his flight companion, a white parrot.



The Honor Roll

(Continued from Page 8)

Lt. Theodore J. Boselli.....*Harriman mission to Russia.*

Master Sergt. Adolph Cattarius.....*Flight to Britain, summer, 1941.*

Master Sergt. Joseph H. Walsh.....*Harriman mission to Russia.*

Tech. Sergt. Charles M. Kincheloe....*Four trans-Atlantic ferrying flights.*

Staff Sergt. R.J. Barrett, Jr.....*Extraordinary achievement while participating in an aerial flight as 1st Radio Operator on an urgent and vital mission from Belling Field to Netherlands East Indies.*

Staff Sergt. Elvin P. Wescott.....*Harriman mission to Russia.*

SILVER STAR

Maj. General Lewis Brereton

Lt. Nelson P. Davis (Co-pilot)

Lt. Bruno Deltissier (Bombardier)

Lt. Raymond W. Giannini (Navigator) - *Participation in an attack on the Andaman Islands, April 2.*

Lt. Paul J. Long (Co-pilot)

Lt. Delmar J. Rogers (Pilot)

Lt. M.J. Svovode (Navigator)

Staff Sergt. E.E. Lindley (Bombardier)

Lt. Gene L. Bound.....*Outstanding action during aerial engagement over Bali, Feb. 7.*

Lt. Robert L. Ferry.....*Meritorious achievement in the performance of an aerial flight against the armed enemy.*

Lt. G.A. Whiteman (Posthumous).....*Gallantry after his plane had been shot down Dec. 7, in the Japanese attack on Oahu, Hawaii.*

Staff Sergt. Charles A. Fay.....*Initiative, presence of mind, coolness under fire and determined action.*

PURPLE HEART

Major Norman H. Llewellyn
(Posthumous)

Capt. Elmer Felix Parsel
(Posthumous)

Lt. James V. Cunningham

Lt. G. Harkness (Posthumous)

Lt. Duke Paul (Posthumous)

Lt. R.B. Sprang (Posthumous)

Sergt. Howard A. Bennett

Sergt. R. Gregor (Posthumous)

Corp. R.F. Sampson

Corp. Clifford C. Ventriss

Pvt. O.B. Knox (Posthumous)

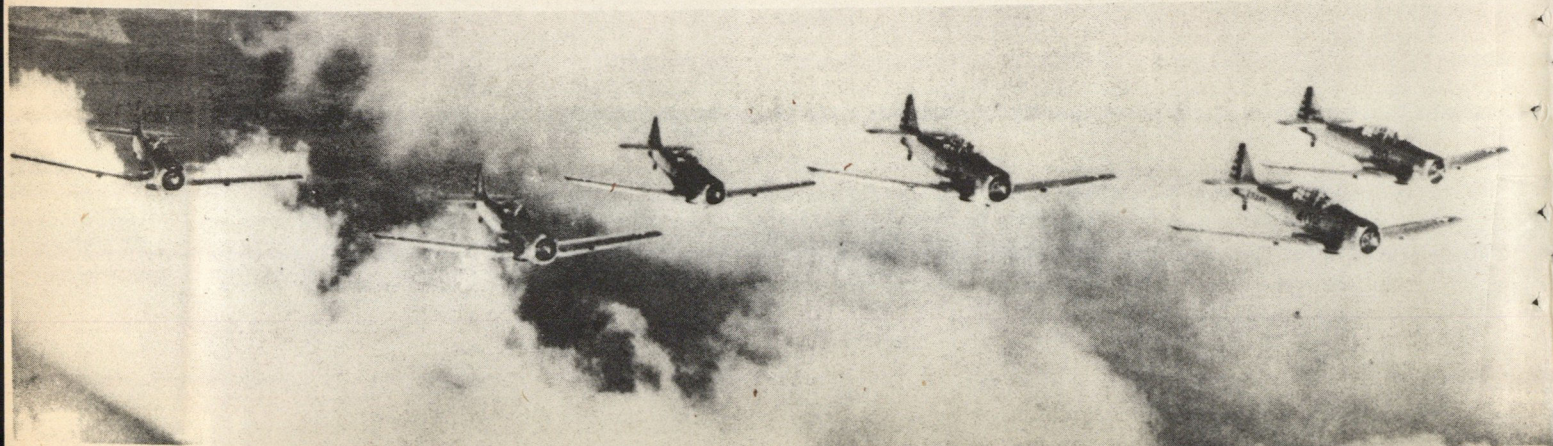
Pvt. J.C. Paounoff (Posthumous)

Pvt. John N. Richards

Pvt. Willie T. Stokes

(Posthumous)

Pvt. Leonard York



Sweeps Over France

by Flight Lieut. Brendan "Paddy" Finucane

Royal Air Force

The author, leader of a famous Australian fighter squadron, late in May shot down his 32nd German plane over France. A few months earlier he had celebrated his 21st birthday by bagging his 21st enemy aircraft. Flight Lieut. Finucane's 32nd was a new Focke-Wolf 190. It brought his score even with that of the South African pilot, Wing Commander A.G. Malan, now officially listed as missing, who had the highest score in Britain's Fighter Command.



I have been on about 50 sweeps, and most of my victories have been gained over France. I've got my bag because I've been blessed with a pair of good eyes, and have learned to shoot straight. I've not been shot down--touch wood--and I've only once been badly shot up (I hope that doesn't sound Irish). And for all that I've got a lot to thank the pilots in my section. They are Australians and I've never met a more loyal or gamier crowd of chaps. They've saved my bacon many a time when I've been attacked from behind while concentrating on a Messerschmitt in front of me, and they've followed me through thick and thin. On the ground they're the cheeriest friends a fellow could have. I'm sure that Australia must be a grand country if it's anything like it's pilots, and after the war I'm going to see it. No, not flying, or farming. I like a job with figures--accountancy or auditing.

Perhaps that doesn't sound much like a fighter pilot. But pilots are perfectly normal people.

Before going off on a trip I usually have a feeling in my belly, but once I'm in my aircraft everything is fine. The brain is working fast, and if the enemy is met it seems to work like a clockwork motor. Accepting that, rejecting that, sizing up this, and remembering that. You don't have time to feel anything. But your nerves may be on edge--not from fear, but from excitement and the intensity of the mental effort.

I have come back from a sweep to find my shirt and tunic wet through with perspiration.

Our chaps sometimes find that they can't sleep. What happens is this. You come back from a show and find it very hard to remember what happened. Maybe you have a clear impression of three or four incidents, which stand out like illuminated lantern slides in the mind's eye. Perhaps a picture of two Me. 109's belting down on your tail from out of the sun and already within firing range. Perhaps another picture of your cannon shells striking at the belly of an Me. and the aircraft spraying debris around. But for the life of you, you can't remember what you did.

Later, when you have turned in and sleep is stealing over you, some tiny link in the forgotten chain of events comes back. Instantly you are fully awake, and then the whole story of the operation pieces itself together and you lie there, sleep driven away, re-living the combat.

congratulating yourself for this thing, blaming yourself for that.

The reason for this is simply that everything happens so quickly in the air that you crowd a tremendous amount of thinking, action and emotion into a very short space of time, and you suffer afterwards from mental indigestion.

The other week I was feeling a little jaded. Then my seven days' leave came round, and I went back bursting with energy. On my first flight after getting back I shot down three Me.'s in one engagement, and the next day bagged two more. That shows the value of a little rest.

The tactical side of the game is quite fascinating. You get to learn, for instance, how to fly so that all the time you have a view behind you as well as in front. The first necessity in combat is to see the other chap before he sees you, or at least before he gets the tactical advantage of you. The second is to hit him when you fire. You mightn't have a second chance.

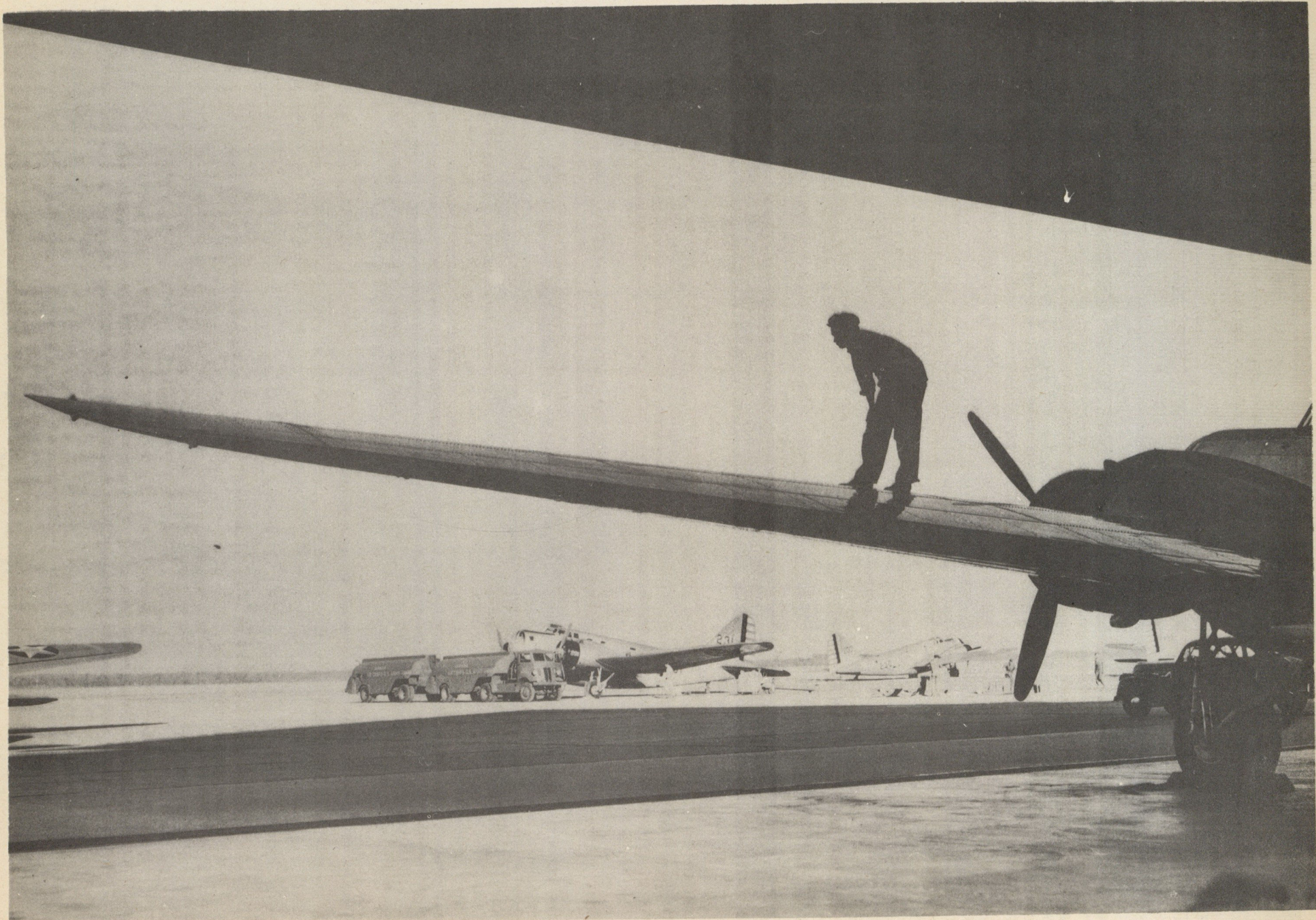
After a dog-fight your section gets split, and you must get together again, or tack on to others. The straggler is easy meat for a bunch of Jerries. Luckily, the chaps in my flight keep with me very well, and we owe a lot to it. On one occasion recently I saw an Me. dive on to one of my flight. As I went in after him, another Me. tailed in behind to attack me, but one of my flight went in after him. Soon half a dozen of us were flying at 400 mph in line astern, everybody, except the leader, firing at the chap in front of him.

I got my Hun just as my nearest pal got the Hun on my tail, and we were then three Spitfires in the lead. When we turned to face the other Me.'s we found that several others had joined in, but as we faced them they turned and fled.

The nearest I've been to being shot down was when another pilot and I attacked a Ju. 88. The bomber went down to sea level so that we could only attack from above, in face of the fire of the Ju.'s rear guns. We put that Ju. into the sea all right, but I had to struggle home with my aircraft riddled with bullets and the undercarriage shot away.

I force-landed without the undercarriage, and was none the worse for it. But it wasn't very nice at the time.

Well, as I said just now, one day I'm planning to go to Australia--and audit books.

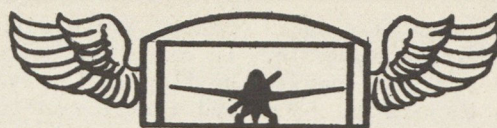


Gassing up at Barksdale

Confessions of a Veteran Pilot

By Captain W. V. Brown

Wheeler Field, Hawaii



I went to Randolph and Kelly Fields ten years ago, as a Flying Cadet. We had a mighty fine class of boys, 208 started I believe, and 83 were graduated. Almost all of the fellows were out of college a year, had worked at depression jobs, and decided that flying held a vastly more impressive future. Besides, Randolph Field had just recently been constructed as a magnificent new training center, and we were all anxious to take a crack at flying at this beautiful field.

We turned out some good men, too. To mention a few: Capt. Bierne Lay, Jr., whose "I Wanted Wings" and other stories have made their mark among the real yarns of flying lore; Jack Strickler, who is designing speedy ships for pursuit pilots; several officers who must remain anonymous who are working night and day to provide better planes by constant testing at Wright Field; scores of crack airline pilots, who are also now ferrying military airplanes for the Allies to all corners of the globe; and the remainder, without exception I believe, occupied with Service flying.

Our training together provided a bond which is closer than any fraternity could ever hope to attain. We lived, slept, talked, ate, drank, and practiced flying as a closely knit unit for one whole year, with the result that we came as close to being 83 brothers with a common purpose as it is possible for unrelated men to be. That is why I like to hear of the present day feats of men from my class, and why I look back fondly on their exploits of the past.

Classic Boner

I recall a classmate at Randolph Field who pulled the classic boner of many another unsung pilot. He was making a practice landing during his basic training stage into a comparatively small strange field, when he saw that he was rapidly running out of field while still rolling on the ground at a fast clip. The fence ahead became a prominent landmark on the immediate horizon. An experienced pilot would have opened his throttle and gone around again for another attempt, but not this lad. He figured he could "Whoa, Nellie!" and pull up short; so he practically stood on his brakes and promptly flipped over on his back.

He was flying a biplane trainer, comparatively large and sturdy, and when the dust cleared and he had oriented himself, he could see that his ship was resting comfortably on its upper wing with the fuselage well above and parallel to the ground, he himself gazing back down the field upon which he had just

tried to land, with his normal vision somewhat distorted, since he was hanging upside down in his seat, with only his tautly stretched safety belt accomplishing his defiance of gravity.

Thoughtfully considering the safety of his airplane and mindful of the fire hazard, as he hung slothlike in his cockpit, he carefully cut off his ignition and all other electrical switches, closed his fuel selector valve, and after deciding that he was unhurt and ready to leave the ship in good order, he released his safety belt with a flip of the catch and immediately fell on his head to the ground four feet below, knocking himself out and spraining his neck to such an extent that his recovery required a three weeks tour in the hospital.

It Stayed Dedicated

A dedication ceremony I shall never forget was that of a newly completed stagehouse at an auxiliary field near Randolph. By way of explanation, a stagehouse is generally a small wooden building for the comfort and convenience of instructors who are watching the practice landing performances of their solo students, and provides also a meeting place for other students who are awaiting their turns to fly and be judged. The house always has ample plumbing accommodations, though sometimes of a rustic nature, depending on the locality. This particular house was situated nearly in the center of a large practice field, with a commodious and conspicuous adjacent building devoted to the installation of sanitary facilities.

On this particular morning I was watching my instructor's other student making practice landings over a hurdle, trying to pick up a few pointers on how and what not to do when I had my own turn with the ship, when out of the sky from the west came a large formation of Keystone bombers, the big lumbering biplanes flown in the Bombardment section at Kelly Field in those days for the training of bomber pilots. They swept majestically in a wide circle several times around the field, then swung into line and passed in review in close formation directly over our heads, about one hundred feet up.

When just above us, a rain of paper rolls descended upon us from the rear cockpit of each airplane, with quite a few direct hits being scored upon the stagehouse. I later learned that the Kelly instructors had decided that an edifice of this nature had never before been properly christened, so they utilized a real graduation review practice formation

flight for the execution of their ceremony. Doggone practical too, considering the nature of the bombardment missiles.

While we're dealing in indelible experiences, here's another feat which will always stick in my memory. The incident occurred some years ago in the fall, October to be exact. My friend, whom we'll call Homer, then stationed at a field in the northwestern United States, was on an altitude mission in a two-place observation airplane when he happened to glance at the instrument panel clock and saw that it was lunch time. He had completed his mission, so he lazily half-rolled and headed for the ground. A few seconds afterwards, the ailerons started to flutter violently, the ship trembled and shook, and with a snapping jolt, both ailerons suddenly peeled off and let go.

The plane immediately went into a tight spiral almost like a spin, which no amount of counter control with the stick and rudder would remedy. Homer ordered his enlisted passenger to bail out, and watched him as he struggled out of the rear cockpit and dived off its edge. With the change of weight distribution occasioned by this action, the ship began to slow up its spiral a bit, and finally by his working of the throttle and the controls in various combinations, the ship came out of the spiral and righted itself. With a little careful experimenting he found that he could partially control the wings by skidding the ship with the rudder, that is, he could lift a wing by applying a bit of opposite rudder. So with rudder and elevator controls only, he decided to try to land the airplane and possibly save it.

He attempted to call the control tower at the field to notify its personnel of his plight in order to have the crash truck standing by ready for his landing, but found that his radio had been put out of commission by the severe vibration of losing his ailerons. So with plenty of altitude in which to maneuver the controls and maintain a fairly even keel, he wrote a note on a piece of paper from the ship's log, took off his leather jacket, stuffed the note in the pocket, and then flew over the field at a safe altitude and tossed the jacket overboard in front of a hangar. He then climbed back up to await results, but he could see his untouched jacket lying on the ground and not a soul in sight. After a few more moments he decided to try again. This time he took off his shirt, wrote the same note, buttoned it in the pocket, and sent the shirt overboard to join the jacket.

As I have said, the month was October, it was lunch time, the locale was northwestern United States. This particular combination rendered it exactly the right time for baseball fans to listen to a radio broadcast of the World Series ball game being played at that hour back east in New York. Especially during the lunch hour all personnel on the ground had their ears glued to their radio sets. Con-

sequently Homer's shirt, like the jacket, received absolutely no attention whatsoever.

Finally in desperation Homer took off his pants, wrote a third note and placed this one in a pocket, and now shirtless and pantless he flew as low over the hangar line as he dared and tossed over his trousers. This last time someone heard the motor in time to run out of the hangar and see the pants floating down, retrieved them, and in short order had the crash truck and other personnel prepared for the possible crackup. However, Homer was such a good pilot that he brought the plane in for a nearly perfect landing, with rudder and elevators alone, sans ailerons, into a small tree-bordered field, without putting so much as a scratch on either wingtip. But he had to remain in the cockpit until someone remembered to bring him his clothes.

No Dull Moment

Some few years ago the Army was ordered to take over the flying of the air mail, in the dead of winter. I know a pilot who was flying the run between Cheyenne and Omaha, in an open cockpit ship one cold February morning. When about 125 miles from his half-way point, North Platte, Nebraska, he noticed that his fuel pressure gauge had suddenly dropped to zero. Having just changed to a full tank of gas, he thought that the tank selector valve was not set properly, readjusted it, and worked the wobble pump a few times. (Incidentally, the wobble pump is merely a manually operated fuel pump to bring gasoline pressure to the carburetor until the motor driven pump operates.) The fuel pressure remained up only so long as the wobble pump was operated. The truth then dawned on the pilot. His motor driven fuel pump had broken. Rather than land at some emergency field with a full load of mail behind, he decided to try to fly on in to North Platte, so for some fifty minutes he held the stick in one hand and worked the wobble pump with the other, alternating hands when the pumping grew tiresome.

Upon arrival over North Platte he saw the kind of a landing he would have to make. The airport at that time was shaped like a slice of pie, the wedge pointing west, with a highway, fence, and the inevitable high tension power line along the north edge, and the Platte River forming the southern boundary with its embankment. The one hangar was situated at the point of the wedge, and the arc of the slice was rough with sand dunes. A thirty mile wind was blowing from due south, which made for only one choice; that is to land across the narrow slice, over the high tension lines toward the river.

After carefully circling several times in search of the best spot on the field, and having gone over mentally the things he would have to do practically simultaneously while landing, the pilot started his final approach for a landing. Keeping the wobble pump going with one hand and holding the stick between his

knees, he rolled back the stabilizer and rolled down the flaps with the other hand, using his left elbow to jab at the throttle to retard it when necessary, while steering the rudder conventionally with his feet. When just short of the ground, he slapped the throttle shut, grabbed the stick with his right hand from between his knees, and kept pumping the wobble pump with his left. Luckily he timed his actions correctly, for he landed according to intention and rolled to a stop safely, and well short of the river bank.

If anyone ever spent a busier sixty seconds I should like to know about it; for I was that pilot.

Omaha Express

Then there was the example of straight thinking which overcame an emergency with hands down honors. However, I would not recommend the practice for habitual usage, since it is definitely non-habit forming:

On a night flight out of Chicago the weather had gone suddenly sour, a blizzard set in, drowning out all radio beam signals, and the snow cut visibility to a radius of from cockpit to wing-tip lights (and they looked fuzzy); so there was nothing left for the pilot to do except keep flying, or else. He kept his course and maintained a safe altitude for more than an hour, after which it stopped snowing, but he was still flying on instruments in the solid overcast. Estimating his position by elapsed flying time and with his radio still useless because of static, he cautiously eased down to what he thought was a safe minimum altitude to try to get a glimpse of a break-through or hole in the clouds. No luck. Finally, he went as low as he possibly dared and still retain a safety margin, and after a while began to fly through open space and scuds, with the solid ceiling a few feet over his head.

His original destination was Omaha, west and just a bit south of Chicago. He had tried to keep his course as nearly correct as possible, but he had no way of telling what his drift had been, whether he was north or south of his proper track, or exactly how far he was from Omaha. In short, he was lost, which provided the necessity that mothered his inventive genius.

He noted the first lights he came to, a small town, and tried to find the main road running in an east-west direction. With better visibility but still a low ceiling he noticed another town off to one side of his course, a larger one which upon investigation proved to have a highway running in the desired direction. He followed it by the lights of the few cars traveling at that time of night, and came to another town. Feeling that he was at least paralleling his intended course, he was following the road along when he happened to glance down at a car over which he had just passed. It was a passenger bus, with a lighted sign above its front windshield. He cautiously circled and flew low over the bus, getting a

fleeting glimpse of "OMAHA" on the sign as he flashed past.

Taking a figurative hitch in his fuel belt, he lessened his throttle to minimum for safe flying speed, leaned the mixture control as economically as the engine would take without loss of power, and literally circled the bus into Omaha.

I later asked him what he would have done had he run out of gas.

"I had figured my gas consumption closely" he said, "and would have kept the last ten gallons for one of two choices. The first, a trial parachute flare to see if there was sufficient open space to try a landing with wing lights, and if not, to climb to sufficient altitude into the overcast, cut my ignition, set the stabilizer for a glide, and bail out, without fear of total destruction of my mail cargo or injury to myself."

Pretty smart thinking all the way through, don't you agree? If not, try it yourself some bitter cold night, without benefit of armchair, pipe, lounging robe and slippers!



T N T FOR TOKYO

Up! Up! My lads, the moon is fair,

We've work to do in upper air.

Cargo, tonight, as you must know,

Is T. N. T. for Tokyo.

Avenge Pearl Harbor and Bataan?

Hell Yes! We'll do that - every man.

And, time is near when we will sow

Our righteous wrath on Tokyo.

We'll comb the land, the clouds, the seas

Until we find the Japanese.

And when we do we'll fix them so

They'll not return to Tokyo.

So gather, Eagles, in your might,

A battle brood that's fit to fight.

Equipped with men and planes to go,

We'll blast Hell out of Tokyo.

*N. R. Cooper,
Lt. Col., Air Corps.*

Chanute's Favorite Son

by Maj. M. F. Ranney

Chanute Field, Ill.

DOWN through the years America's soldier has provided inspiration for story, poem and song. But no less imposing is his contribution to the pictorial arts, whose vast galleries reveal him in a multitude of artistic styles.

Each of America's wars has produced not only styles and idioms of artistic expression, but often definite characters. These, in time, have become associated definitely with that war.

World War I gave us such well-remembered characterizations as the "Dere Mabel" series, Ahern's "Balmy Benny" and Bruce Bairnsfather's "Ole Bill". The Spanish-American and Civil Wars produced their particular characters. Even the present day cartoon conception of "Uncle Sam" dates back to the Mexican War.

It is not unusual, then, that this war should produce its crop of characters destined to join the parade.

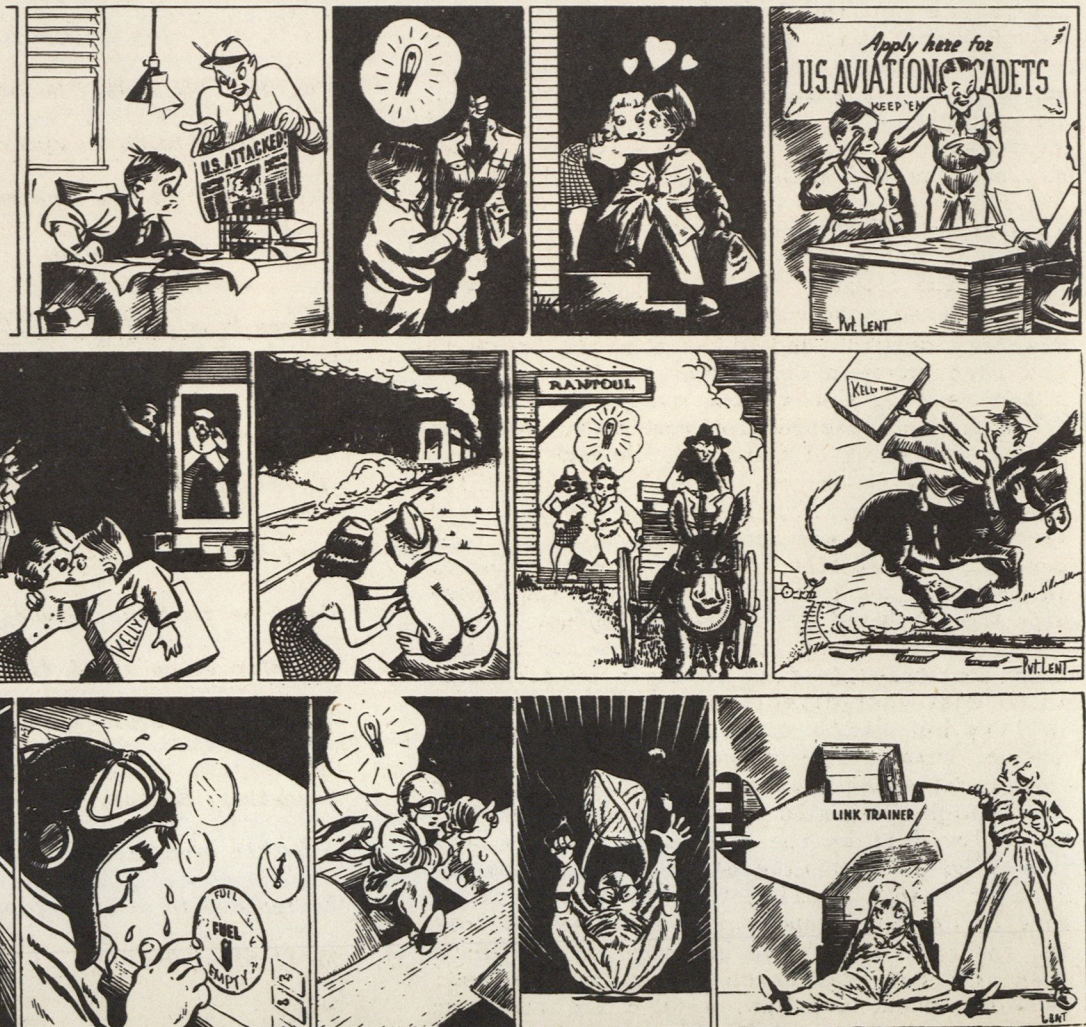
At Chanute Field such a character has taken

rank with the thousands of soldiers undergoing technical training there. His name is "Reggie". He is the brainchild of Sergeant William T. Lent, staff artist assigned to the Chanute Field public relations department.

As to pedigree, "Reggie" has absolutely none. He did not come in a dream, nor creep out of the mists of imagination. He just popped up one day before Artist Lent's drawing board in the public relations office--a real flesh-and-blood soldier, with an elfish cast in his eye and a hair-trigger smile. He had a way that was pleasing and a good personality.

Alert Sergeant Lent recognized in this soldier something that typified all the soldiers at Chanute Field. Lent's pen rapidly traced lines on his drawing board; the sketch took form--and in a minute or two, there was a character!

Sergeant Lent stylized his new character, and without altering him physically from his real-life prototype, developed a personality which had individuality, yet embodied certain



Sergeant Lent, upper left, and some glimpses from the life and aviation career, of his brainchild "Reggie"

collective traits of all the men around him.

Such a depiction is not easy. But Sergeant Lent—Private Lent in those days--was a skilled illustrator who came to the Army with a well-rounded background in the field of art. He had left a position in the art department of one of the country's largest firms and came to Chanute Field where his talents were put to work in the public relations department.

"Reggie" made his debut officially as a cartoon character June 6, 1941, in *Wings*, the Chanute Field post newspaper. He offered something different in soldier art. Unlike most cartoon strips, Lent used no "blurbs" and the pictorial story depended entirely on action for its continuity.

Under Lent's guidance "Reggie" was a personable fellow whose antics were designed to bring a laugh and at the same time carry a moral. Often the moral was secondary to the laugh--but the two were usually there together.

Thus, "Reggie" in a sense became a "propagandist"--at least an instrument to put ideas across in a pleasing way without preaching about it. Truth is, he has been detailed to countless such assignments, putting forth a message in one way or another, and serving up a smile at the same time.

And how do the soldier readers who follow "Reggie's" adventures like him?

Some time ago a poll was taken and "Reggie" proved himself 100 percent popular. When Artist Lent was released from service October 16, 1941, because of his age, "Reggie" dropped from the pages of *Wings* and the pleas were so numerous that Lent threatened to continue the feature after his return to civil life. However, Lent re-enlisted last January 9 and "Reggie" promptly returned to his former place in *Wings*.

Most creatures of the imagination lack realism. Not so with "Reggie". Lent spends hours observing the men around him and the product of these observations asserts itself in the shape of "Reggie's" next strip. The remarkable fact is that "Reggie" was patterned after one typical soldier, but reflects the characteristics of many different ones.

When Lent returned to duty in January interest in Aviation Cadet training was at a high pitch, and "Reggie" was launched on a new career as an Aviation Cadet, which series is currently appearing in *Wings*, keeping the advantages of this field of training constantly before post personnel.

The "Reggie" strip has attracted wide attention and from time to time has been reproduced in numerous newspapers, magazines and other national publications. Presently it is appearing through a courtesy arrangement in *Texacts*, post newspaper at Sheppard Field.

In its broader aspects, the "Reggie" cartoon has had a material effect on morale at Chanute Field; not alone in the particular sense that he has provided amusement through his humorous

antics, but more through the fact that he has been a source of inspiration. It was in a large measure because of interest in "Reggie" that Chanute Field soldiers staged an art exhibition between August 16 and September 9 last year.

Actually there were many soldiers who had artistic ability. Seeing "Reggie" as a product of their own post, made them eager to have a go at drawing, painting and photography.

The Chanute Field exposition, one of, if not the first of its kind in the Army, brought together many men of mutual interest. The event was widely publicized and interest outside Chanute Field was equally ardent. Supported by the post newspaper and civilian newspapers in the area, thousands of soldiers and civilians viewed the exhibit, which was climaxed when a committee of prominent artists judged the winners.

In the ranks of American soldiery today there are doubtless many other budding masters. The barracks room scene--the shadowed hangar--the study of a single face--these and many more rise up from the soldier's canvas to present a story no words can tell. All combine to make a picture-history that will live.

RESCUING 56 ship-wrecked sailors is all in the day's work for the crew of a big Sunderland flying boat of the RAF Coastal Command.

One day while making a routine patrol flight the captain of the flying boat spotted three life-boat loads of men floating aimlessly down below. Landing, he piled the whole bunch--56 of them--into his ship and brought them home. He had to taxi for five miles over the sea before he could get his plane in the air.

The rescued men were the survivors of a U-Boat attack on a British merchantman 200 miles off the coast of Britain. They had been adrift for 16 hours.

SPECIAL instruction in military camouflage for Air Forces officers will be started shortly at the Engineer School, Fort Belvoir, Va. and at the Aviation Engineer School, March Field, Calif.

The first class, held at Fort Belvoir, will be for 70 officers--50 from the Air Forces and 20 from the Ground Forces. The course will consist of two weeks' intensive training, including concealment of airdromes, dispersal and concealment of aircraft, and the use of photographs in camouflage interpretation. The course will also include the carrying out of actual camouflage projects in the field.

The purpose of the course will be to extend a knowledge of camouflage throughout the Air Forces and to provide every squadron with officers trained in the use of camouflage in combat operations.

Maximum Aircraft Speed

By Lieut. Perry J. Ritchie

Sub-Depot Engineering Officer,
Stockton Field, Calif.



BACK in 1930 it would have seemed logical to predict that by 1940 the maximum speed for aircraft would be about 575 mph, since from 1920 to 1930 the speed increase was about 19 miles per hour per year. But it is now 1942 and the maximum speed record is approximately 100 mph less than would have been predicted in 1930.

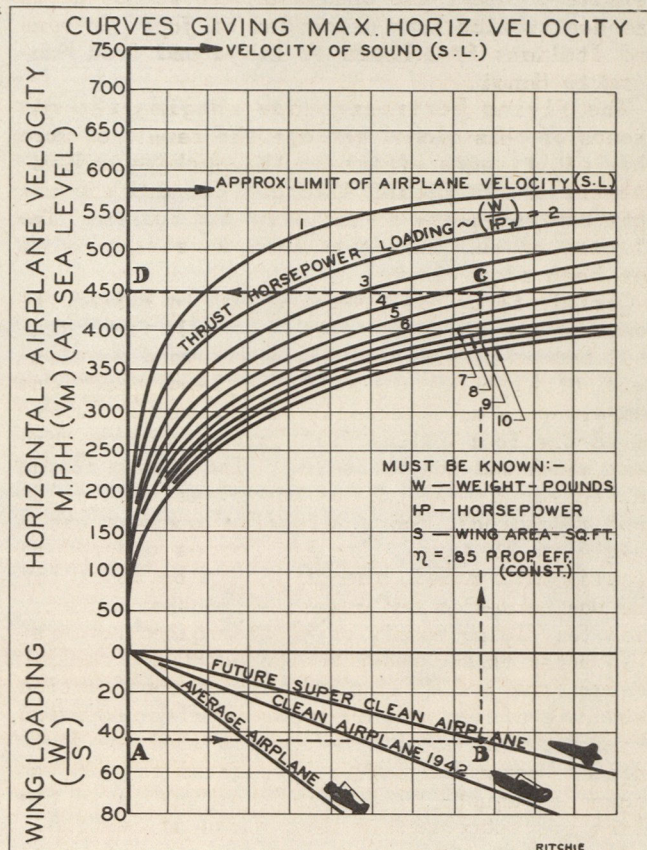
This question immediately arises. Why does the curve flatten out, indicating that higher speeds are getting harder and harder to attain?

There are a good many reasons for this. Among the most important are: the "compressibility effect" on the propeller and airplane; power plant design; want of more maneuverability; increased armament; cost; and last but by no means least, the physiological aspect.

The factors affecting the speed of an airplane are horse power, propeller efficiency, drag, wing characteristics and weight. Also, after attaining a speed of about 350 mph an entirely new factor comes up which has to do with the approach to the speed of sound. After passing this speed (350 mph) the effect of compressibility of the air becomes noticeable, and the compressibility effects become worse as the speed increases.

Whenever the velocity of the air around any part of the airplane equals the speed of sound, a so-called shock wave is formed. This causes an entirely new type of air flow. When this compressibility shock wave forms, a considerable amount of energy is lost as heat and the drag jumps up. At the same time, the lift decreases so that a greater angle of attack is required, thus leading to a further increase in drag. All of these factors are included in a high speed equation, and a very simple high-speed curve may be plotted as shown in the graph. A little explanation of this curve will enable anyone to approximate the high speed of almost any airplane.

Three things must be known about the airplane; weight, wing area, and horse power. These three quantities are easily obtainable because of their basic importance in the airplane design. From these quantities the wing loading and thrust horse power loading can be found by use of the following equation:



Wing Loading = $\frac{\text{Weight (Pounds)}}{\text{Wing Area (Square Feet)}}$

Thrust Horse Power Loading = $\frac{\text{Weight (Pounds)}}{\text{Horse Power} \times .85}$

Starting with the wing loading at "A", going horizontally to the line that corresponds to the shape of the airplane being considered, which gives point "B", go vertically from "B" to the curve that corresponds to the thrust horse power loading which gives us point "C" and going horizontally back to the left side of chart to point "D" which is the maximum airplane velocity in mph.

It is noticed from the graph that it is almost impossible to get a speed over 575 mph even with an airplane that is super-clean, having a 60 lb. per sq. ft. wing loading and a thrust horse power loading of one lb. per horse power.

(Maximum speeds referred to in this article apply only to horizontal flight. Aircraft speeds in excess of 600 mph have been made in free falls. As a matter of interest, this theory of maximum speed was advanced by Prof. Baldwin at the University of California as far back as 1926. --Ed.)

Boeing's Flying Fortress . . . Toughest of All

ONE of the most effective weapons in the Army Air Forces' arsenal is the Boeing B-17 Flying Fortress. General Arnold has described it as "the guts and backbone of our aerial offensive". Under the shadow of its wings, death and destruction have descended on Japs, Germans and Italians from Luzon to Libya and from Hamburg to Hanoi.

The Flying Fortresses now ranging the air fronts of this global war are the result of more than eight years effort by the workers and engineers of the Boeing Aircraft Co. and the pilots and engineers of the Army Air Forces. The history of this ship has been as stormy as it has been significant.

Our air force has always sought to extend the range of its striking power. By 1934 the Martin B-10 bomber had pointed the way toward development of high speed, multi-engined monoplane bombers with an internally braced wing. We entered the four engine field with a design contest which was won by Boeing. The Boeing design called for a four engine monoplane with a 150 foot wingspread, heavy defensive armament and a weight of 35 tons. The Air Forces ordered an experimental model, the XB-15, to be built for the Boeing design and announced another competition for flying models of multi-engined bombers.

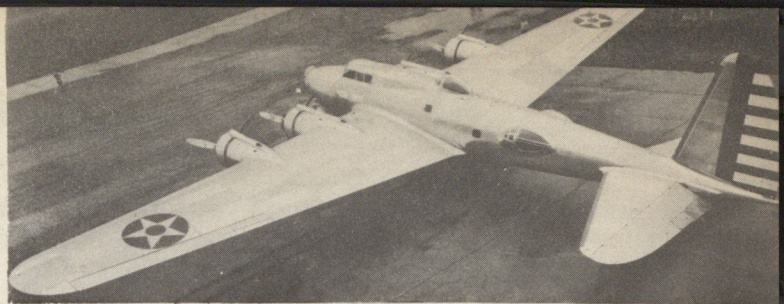
To enter this contest Boeing hatched a smaller design from its XB-15 plans, added construction features of its highly successful commercial transport—the Model 247—and produced the four-engined Boeing Model 299. Design of the 299 was begun in August, 1934, and 11 months later the plane was successfully test flown at Seattle.

This \$600,000 experiment weighed 16 tons against the projected 35 of the XB-15 and had a wing span of 104 feet. It had a slim, highly tapered fuselage marked by gun emplacement blisters. Its four engines were set in the leading edge of its single wing; bomb load, defensive armament, speed and range surpassed those of all previous bombers.

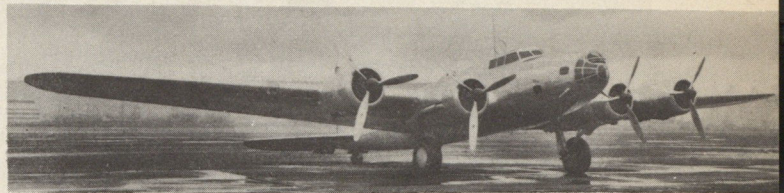
Just a year after its design was begun, the 299 was flown from Seattle to Wright Field (2,000 miles) by Boeing Test Pilot Lee Towers in nine hours for an average of 226 miles per hour—an unofficial non-stop speed-distance record. At Wright Field the 299 was entered as the XB-17 in competition with twin engined models and flown by both Boeing and Air Corps personnel. Before the tests were completed the big ship crashed after taking off with locked controls.

On the basis of its performance the Air Forces ordered 13 YB-17s for service testing in the field and an extra model to be broken up in static testing at Wright Field. The first YB-17 was delivered in January, 1937, and all were in service by midsummer.

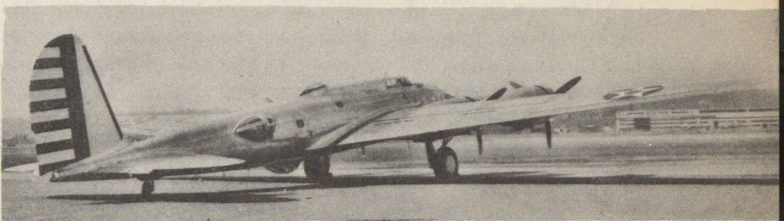
Few planes have been given such arduous service tests as those first Flying Fortresses. It



YB-17



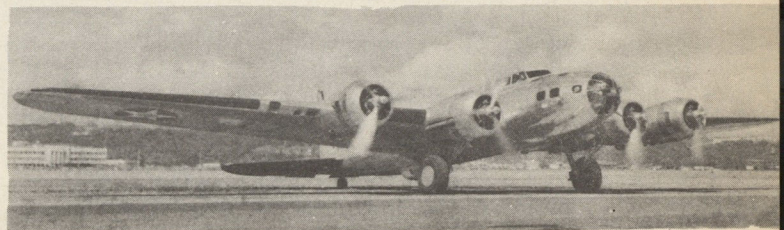
YB-17A



B-17B



B-17C



B-17D

was this batch of Fortresses, flown by the men of the Second Bombardment Group at Langley Field, that were to make aviation history and lay the foundations for the development of heavy bombardment. The records of the first ferrying flights to deliver new Fortresses from Seattle to Langley include the names of some of the men who later flew these planes to fame--Maj. Gen. Robert Olds, Brig. Gen. Harold Lee George, Col. C. V. Haynes, Lieut. Col. Alva Harvey, Major W. D. Old and others who now wear decorations won by the exploits in the big B-17s. Among the crewmen were Capt. Adolph Cattarius and Lieut. James Sands who rose to their present ranks from sergeants as a result of their work on four-engined bombers.

With their YB-17s the pilots and crews of the Second Bombardment Group smashed records with great regularity. They flew the Fortresses higher, faster and farther with heavier loads than any other military plane and they pointed out the path of heavy bombardment development in spectacular fashion.

General Olds led a flight of six Fortresses from Langley Field to Buenos Aires in February of 1938 and in November 1939 led another flight of Fortresses to Rio de Janeiro. The Buenos Aires flight won the Mackay trophy for the Group and the Distinguished Flying Cross for General Olds. General George, and Cols. C.V. Haynes and Vincent J. Meloy flew three Fortresses to Bogota, Colombia, in August, 1938. To settle an argument on the plane's range, a B-17 was flown 1,400 miles non-stop from Bolling Field to Bermuda and return.

During the summer of 1938 military economic and political pressure threatened to end future development of the B-17 and might have succeeded but for the performance of a Langley Field pilot. During a long range test a heavily loaded B-17 was inadvertently stalled and spun through a heavy overcast. The plane's wings were bent due to the excessive load developed during the maneuver but the pilot recovered from the spin and landed the plane safely. Recording instruments carried on the flight showed that the plane had held up under more strain than it was designed to stand.

This performance eliminated the necessity of static testing the 14th plane in the YB series. Maj. Gen. Oliver P. Echols, then chief engineer of the Materiel Division, ordered the static test plane converted into a flying model and equipped with turbo-superchargers to experiment with high altitude performance. At that time there were no further funds for B-17 development. If it were not for the unscheduled Langley Field performance, the Fortress might never have climbed into the stratosphere and proved the value of heavy bombardment.

Engineers of the Air Forces and the Boeing Company collaborated on installation of the turbo-superchargers on this plane and it took to the air over Seattle in January 1939 as the YB-17A, the first stratosphere bomber. On the

basis of the YB-17A's performance, the 39 B-17Bs were ordered equipped with turbo-superchargers.

During the summer of 1939 the growing Fortress family smashed a series of national and international records to celebrate the 30th anniversary of the Air Corps. General Olds began the record breaking on July 23, piloting a YB-17 to 24,034 feet with a payload of 5,000 kilograms. This performance set three national records. Two days later Lieut. Col. Alva Harvey, piloting another Langley Field YB-17, carried a 5,000 kg payload for 2,000 kilometers averaging 200 mph to set eight national records.

August 1 of 1939 was a big day for the B-17s. Capt. C. S. Irvine in a 17A carried a 2,000 kg payload for 5,000 kilometers, averaging 166 mph to break the international record set the year before by two Italian airmen. On the same day Capt. Irvine reached 34,025 feet in the B-17A carrying a 5,000 kg payload to smash the international record set by two German pilots in a Junkers model in 1938.

That same day the first B-17B to roll off the Boeing production line arrived in New York just 9 hours, 14 minutes and 30 seconds out of Los Angeles averaging 265 mph to smash the old transcontinental record of 221 mph made by the Douglas DC-1 in 1935. Col. Stanley Umstead and Lieut. Col. Leonard F. Harman, now chief of the Bombardment Branch, Production Division at Wright Field, were the pilots. Their flight was made at an average altitude of over 26,000 feet.

The XB-15 which made its first flight in October 1937, also took part in the record breaking. Piloted by Col. Haynes and Maj. Old the XB-15 carried 31,180 pounds payload to 8,200 feet on July 30 to set an international record for payload at 6,000 feet. On August 1-2 Col. Haynes and Maj. Old set an international speed record of 166 mph over 5,000 kilometers with a 2,000 kg payload. The B-15 flew steadily for 18 hours and 40 minutes over a closed course between Patterson Field and the MacChesney airport near Rockford, Ill.

Col. Haynes also flew the B-15 from Langley Field to Santiago, Chile with a ton of Red Cross supplies to relieve victims of the September 1939 earthquake in Chile. He received the Distinguished Flying Cross for this performance.

The B-17C appeared in 1940 with flat paneled gun position replacing the blisters in the early models and a "bath tub" gun position slung under the fuselage. Armor plate protected all gunners and the engines' horsepower was boosted. Early in 1941 20 B-17C's were diverted to the RAF in England and Egypt.

About the time the B-17D was making its debut with leakproof fuel tanks, engine cowl flaps for better cooling in fast climbs, 1200 hp. engines and speed of more than 300 mph, the B-17C was making its combat debut as the Fortress I of the RAF.

France was basking in the warmth of early summer. Shimmering heat waves rippled over the countryside around Brest. Only around the great

docks where the Scharnhorst and the Gneisenau were being repaired was the laziness of the perfect June day ignored. More than 30,000 feet above Brest rime ice was forming on the wings of a Fortress I. The de-icers were cracking it off in great chunks. The cockpit windows were thick with frost and the crew encased in heavy fleecelined winter flying clothes. Without warning a stick of bombs hurtled from the wintry altitude of the Fortress into the midst of Brest's summer day, blowing docks and German workmen to bits. The Fortress had made its first mark on German-held territory.

Another Fortress I piloted by Australians bombed Hamburg from 35,000 feet at high noon and Axis convoys in the Mediterranean also fell under the shadow of Fortress wings before the year was out.

Meanwhile, two huge formations of Cs and Ds were winging their way across the Pacific to the Philippines to reinforce General MacArthur's Army. The first flight from Hawaii to Fort Stotsenburg was led by Major Emmett O'Donnell and all who participated in it were awarded the Distinguished Flying Cross. Col. Eugene Eubank also won the DFC for leading the second mass formation from San Francisco to Clark Field.

In addition to proving the ability of long range bombers to fly to the scene of action wherever it may be, these formations of Fortresses bore the brunt of the Jap attack in the Orient. From their pilots and crews came the first American air heroes of the war--Capt. Colin Kelly, Capt. Hewitt Wheless, Capt. William Bohnaker, pilots; Lieuts. Marion Wheeler and Cecil Gregg, and Sgt. William Burke, bombardiers; Major Fisher, Lieut. Fred Rowan, navigators; and Sgts. John Brown and Louis Silva, gunners. B-17s also evacuated General MacArthur and his staff from the Philippines.

The B-17s proved their combat ability during those first few months when almost alone they tried to stem the tide of the Jap advance through the Indies. The effectiveness of their defensive armament and their ability to outclimb Jap pursuits and bomb accurately from high altitudes were outstanding.

The performance of Capt. Wheless and his crew in fighting their way through 18 Jap Zero fighters to bomb their target and return 500 miles to their base is now an AAF classic. But behind the performance of that battered ship, limping more than 400 miles on two motors, is a photograph of a pile of junk tacked on the wall of Lieut. Col. Harman's office at Wright Field. The junk in that picture is 279 lbs. of hydraulic lines, fuel lines, cocks, gauges and controls ripped from the innards of the B-17 fuel system over two years ago by the Materiel Division, in eliminating "Achilles Heels", so that bombardment airplanes could absorb gunfire.

As part of their program to make bombers less vulnerable to attack, these Wright Field engin-

eers replaced the complicated and vulnerable hydraulic fuel system with a simplified electrically controlled system, using only self-sealing hose. Throttle controls were equipped for operation despite hits by gunfire and much internal equipment was re-designed to insure as efficient operation under combat conditions as possible.

In addition to these features the studies of the bombardment engineers resulted in the B-17E--more than five tons heavier than the original Model 299 and 40% faster. The B-17E has a power turret on top of the fuselage, a dust bin turret below, waist guns and a pair of guns in the tail. All are 50 caliber machine guns. The E has been in action in the Indies and Australia and has proved to be even more effective than its predecessors.

Fortresses are now operating with the Royal Air Force in England and the Middle East; under Lieut. Gen. George H. Brett from Australian bases and under Maj. Gen. Lewis H. Brereton from India. The demand for more B-17s has become so heavy that Vega and Douglas factories will turn out subsequent models in addition to the big Boeing works at Seattle.

At Wright Field a new lab for testing engine performance and durability is being prepared for engines up to 8,000 horsepower.

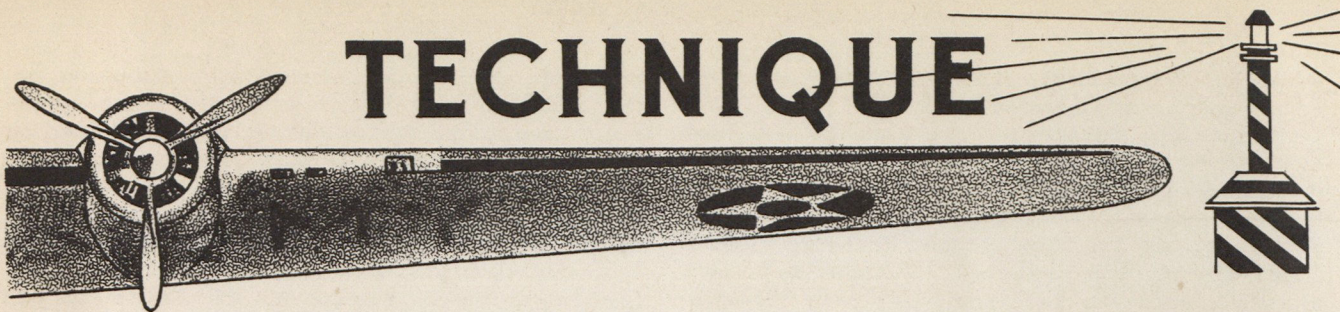
Tomorrow's propellers probably will be reversible as well as full-feathering, since the reversible feature has value as a braking force to shorten the landing roll of heavy aircraft.

In an effort to give its employees a chance to get whatever complaints they may have off their chests, North American Aviation, Inc. recently distributed "gripe" questionnaires throughout its plant. More than 3,500 replies came in almost immediately.

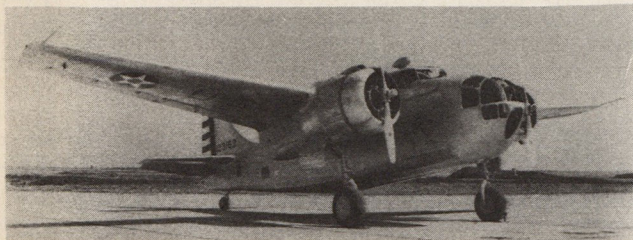
Many of those who replied, however, passed up the opportunity to criticize and used their questionnaires to compliment the Air Forces' production program and North American's part in it. One typical patriotic reply was: "My only gripe--more B-25s, and quick." Another said "No gripes from me", and another: "No complaints, maybe I haven't been here long enough."

Most actual gripes centered about such things as the need for additional lunch areas. President J. H. Kindelberger said that every effort would be made to correct deficiencies revealed by the survey, and announced additional surveys would be made in the future in order to keep up with employee opinion.

Aero medical research reports reveal that a man not adequately protected in the stratosphere will consume--from shivering--six times as much oxygen as when he is warm and at rest. Equipment is now being used by the Air Forces which will prevent exhaustion from this cause.



NEW ADVANCED TRAINERS



The New AT-15

TWO new twin-engine advanced trainers for combat crew instruction--the AT-13 and AT-15--are being delivered to the Air Forces.

The AT-13--already accepted by the Air Forces for quantity production--is made by the Fairchild Corp. It is a midwing monoplane of durable plywood construction, powered by radial, air-cooled engines. It will be used for the training of crews of four to six men, including pilots, bombardiers, navigators and gunners. Equipment includes tricycle landing gear, machine gun turret, internal bomb racks, bomb scoring camera, radio, compass, marker beacon and a complete interplane communication system. Wing span is about 52 feet and weight about 11,000 pounds.

The AT-15--still in the test stage--is being manufactured for the Air Forces by Boeing's new Midwestern plant. Like the AT-13, it is designed for the integrated training of pilots, co-pilots, bombardiers, navigators and gun crews. Equipped with constant speed props, radio compass, automatic pilot, radio, flexible machine gun, gun camera, power turret and bomb bay, the AT-15 looks like a small twin-engine bomber. It is constructed of steel tubing with wood-faired, fabric covered fuselage and plywood covered wings and surfaces. Powered with Pratt and Whitney engines, it has a speed of over 200 miles an hour. Wing span is 59 feet, length, 42 feet.

AIRPLANE MODELS HELP WAR EFFORT

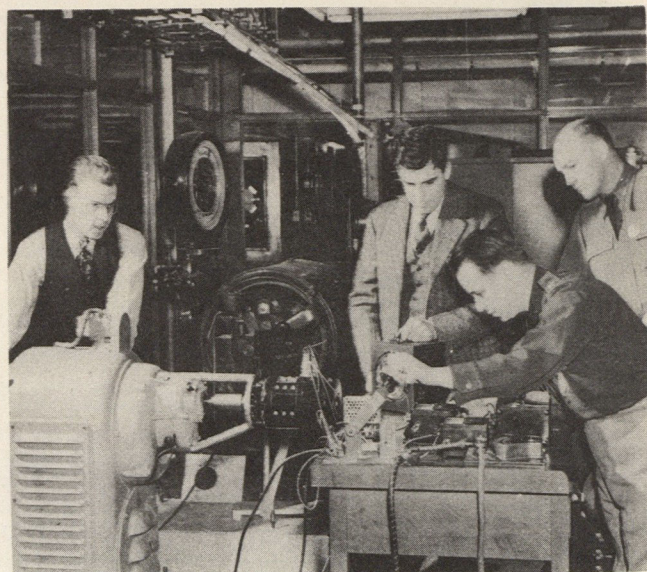
Miniature airplanes of both Axis and Allied powers are being constructed by special contractors to the Army Air Forces. With these models, built to a scale of one inch to six feet, high altitude bomber crews learn how to identify each nation's warplanes. Models now under construction cover the military and naval aircraft of the United States, Great Britain, Australia, France, Italy, Germany and Japan.

STRATOSPHERE COLOR COMING UP

WITHIN the next few months color photographs will be possible from altitudes of from five or six miles. Color film ordinarily used for photos from 12,000 to 15,000 feet will not work at all from five to six miles--too muddy and unbalanced. This problem is being solved with the use of a three-lens camera with matched lenses and special combinations of films and filters which vary from day to day with weather conditions.

Wright Field engineers also report that color photography is now possible at night--with the aid of brilliant flash bombs of colored light. The flashes of these bombs are so bright they can be seen for 200 miles. Photoelectric shutter trippers insure that the picture is taken at the peak intensity of the flash.

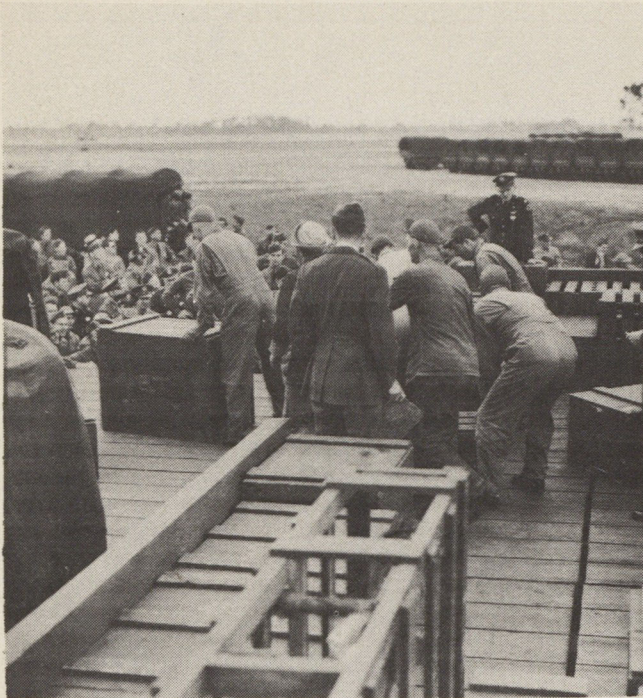
GENERATOR PROGRESS



Generator Lab

In Wright Field's electrical laboratories, Materiel Command engineers have developed aircraft generators which produce 800 percent more power than those of a few years ago. This has been accomplished while the weight of generators was being reduced from 32 to 27 pounds. This great increase in voltage per pound was made possible through perfection of design and increased generator speed. Aeronautical generators now must supply power for from seven to 20 miles of electrical wiring in Air Forces planes.

"FACSIMILE" BOX-CAR AIDS TRAINING



Drew Field's "Ersatz" Box Car

ALTHOUGH the nearest railroad is six miles away, resourceful officers at Drew Field, Florida, have solved the problem of teaching enlisted men how to load and unload freight cars by erecting a "reasonable facsimile" on air base property. Shipping materiel by freight is a necessary part of Air Forces supply.

The simulated box car was built under the supervision of Major Robert E. Slack, Base Supply Officer, and was the idea of Colonel Melvin B. Asp, Commanding Officer of Drew Field. It is complete with ramp and side loading platform, and is portable. It can be converted from a 40-foot box car to a longer 50-foot flat car with very little effort. Sides may be adjusted to both 8½ and 9½ feet widths.

In a recent demonstration a picked crew of men were able to load over 9000 pounds of Air Forces equipment into the car in less than 11 minutes. Another test crew moved two 10-wheel trucks aboard the car and prepared for movement in 20 minutes.

THUNDERBIRD'S "TEE"

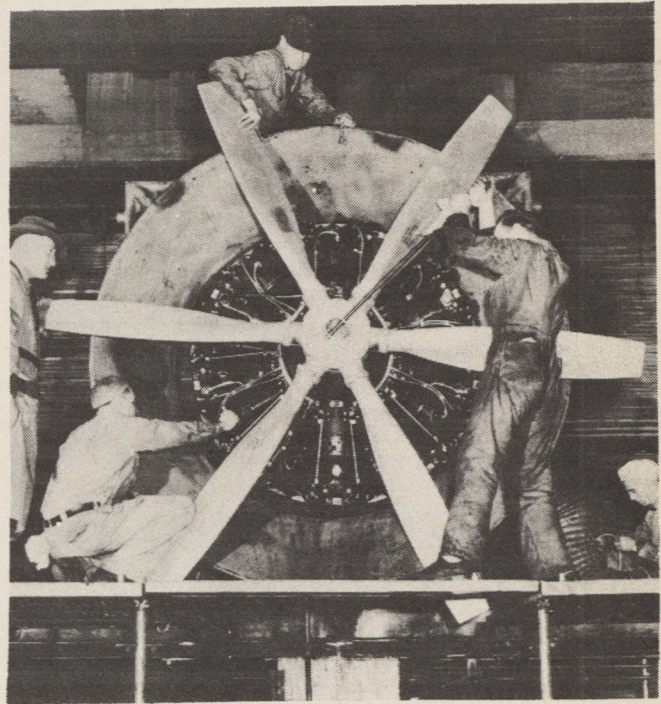
THE largest wind-tee in the world guides pilots at the Air Forces Primary Flying School, Thunderbird Field, Arizona. The huge tee is patterned after the regulation Army tee, but is proportionately larger--with an overall length of more than 71 feet.

The wind finder may be used as a "convertible tee", turned by as little as one mile per hour of wind, or as a pattern tee. If used as a pattern tee, the device will turn only at a certain

adjustable wind pressure--which can be selected within a four to 30 mile per hour range. A 10 mile per hour pressure is usually used. This means that the tee will remain in a pattern setting until a wind of at least 10 mile per hour velocity develops from a new direction.

The tee was designed and constructed by Mr. George Frock, Maintenance Superintendent, and Roy Lindsey, Chief Mechanic at Thunderbird Field.

WRIGHT FIELD "TEST CLUB"



Engine Testing at Wright

The picture above shows the way engines are tested at Wright Field. The six-bladed "object" hooked on the front of this engine is not a propeller. Materiel Command officers call it a "test club". After an engine has whirled this monster around for a couple of days, Wright Field experts have a pretty good idea what it can do for an airplane.

THE new Aircraft Year Book for 1942, published by the Aeronautical Chamber of Commerce, has been printed and is now on sale.

The year book contains a section on the Army Air Forces, one on the Navy Air Forces and another on air transport activities, in addition to a number of special divisions on all phases of aviation. A directory of airplane, engine and aviation equipment manufacturers is also included in the appendix.

Editor of the Year Book was Howard Mingos, of the Aeronautical Chamber of Commerce. The Chamber is located at 30 Rockefeller Plaza, New York City.

Airdromes

(Continued from Page 12)

of the field and operation of airplanes becomes more difficult.

Aircraft land and take-off into the wind decreasing their speed relative to the ground, and hence, the distance required for taking-off or landing. However, it is not always possible to land directly into the wind. With light winds under 5 miles per hour, cross-winds are not serious, but as the velocity increases, it becomes progressively more important to control the direction. Naturally, it will be impossible to meet every condition for the number of runways is limited. Although in peace a larger number can be built, in war, at a maximum, a field airdrome may have 3 runways, and normally 2 runways will suffice. Only in regions of constant winds will a single direction field be constructed.

The arrangement of runways must be such as to utilize the existing ground to maximum advantage. Conventional symmetrical and triangular intersecting layouts should be avoided. Not only are these patterns difficult to camouflage, but the intersections provide vulnerable targets. Instead, a more irregular pattern without crossing intersections should be sought.

Aircraft performance has a definite relationship to the size of the landing and take-off area. In general, as the wing loading of an airplane is increased, the stalling speed of the airplane increases; consequently the speed which must be attained prior to take-off is greater and the minimum safe speed which must be maintained in gliding in for a landing is also greater. It follows that the distance required for an airplane to take-off and land is increased. For each type of military airplane, the wing loading, as well as the ground roll required for taking-off and landing are given in official publications. As these figures are obtained by experienced pilots under favorable conditions, these take-off and landing distances should be increased 20 to 30 per cent to obtain the safe requirement for service conditions. Normally it will not be necessary to know the exact makes of airplanes and their characteristics, as by experience, standard runway requirements have been established for all general classes. The pilot naturally wants the maximum length possible, and the engineer, pushed for time, the minimum permissible. The final length selected will be a compromise, based not only on the type of aircraft which is to use the airfield (and any field may have to take several types) but also on the condition of the approaches, the obstructions and the altitude of the field.

Although greater lengths are desirable for safety, especially for training units, at operational airdromes the following are the minimum runway dimensions which should be equalled or exceeded.

- (1) Light Observation only:
 - Length. 2500 feet
 - Width 100 "
 - Shoulder. . . . 100 " (each side)
- (2) Pursuit
 - Length. 3500 feet
 - Width 150 "
 - Shoulder. . . . 150 " (each side)
- (3) Bombardment
 - Length. 4500 feet
 - Width 150 "
 - Shoulder. . . . 175 " (each side)

The above lengths apply at sea level only. Increased length must be provided at higher altitudes for the take-off run and the landing run, as airplanes land and take-off at higher speeds and climb at flatter angles as the altitude above sea level increases. As a rule of thumb, increase the distance required at sea level 10 per cent for every 1000 feet increase in altitude.

It should be noted that the shoulders are an essential part of the runway, and should be graded to the same grades. At field airdromes, it is not contemplated that the entire landing field will be leveled and seeded. With runways of adequate width, supplemented by this additional cleared strip on each side, there appears to be no military reason demanding the leveling of the remainder of the area. If the ground is unsuited for use without runways, planes unable to land on the runways will gain little benefit by having the whole area graded. The cleared strip on either side of the runway should give ample margin of safety for planes temporarily out of control which run off the pavement.

Although desirable to have clearing continued to give a cleared strip 500' wide each side of the center line, at field airdromes vegetation and low trees which are not major hazards may be left within this 1000' strip. Where local terrain conditions require, airplane revetments may be located within 300 feet of the runway center line. No construction should be permitted in prolongation of the runway.

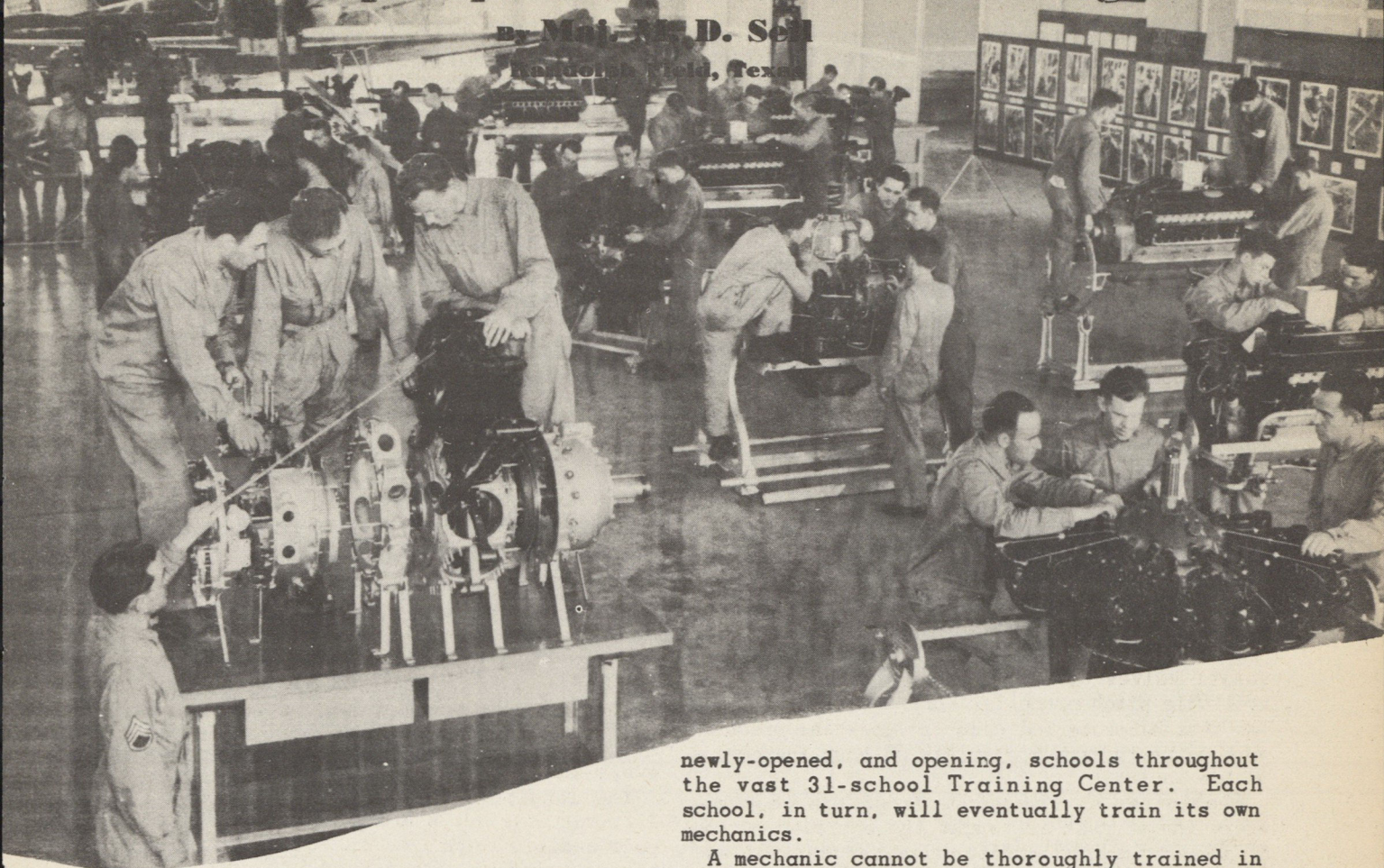
In general, the maximum grade, longitudinally and transversely, should not exceed one per cent (1%). Grade changes should be gradual, not exceeding one-half of the one per cent ($\frac{1}{2}\%$) in any one hundred foot interval. Runway longitudinal intersection grades should be joined by vertical curves at least 500 feet in length. Where practicable, the longitudinal tangent interval between vertical curves on runways should not be less than 1000 feet long.

Runways must be sited to avoid obstacles at their prolongation, as a clear glide path of not less than $1/20$ is needed. When possible, a glide angle of $1/40$ should be provided for the distance of two miles in the approach zone. For instrument runways or where overload take-offs are planned, this glide angle should be $1/50$ for the first 1000 feet. (This is the first of a series of three articles on wartime airdromes by Colonel Smyser. The second article will appear in the July issue.)

Randolph Speeds Mechanics Training

By Maj. M. D. Sell

Randolph Field, Texas



WHEN the Gulf Coast Air Force Training Center dropped airplane and engine operation from the Aviation Cadet basic flying curriculum in February, Randolph Field, the Army Air Forces oldest and largest of the basic flying schools, was left with one vast school-hangar, fully-equipped, but without a student to call its own.

But only for four days. It took just that long to convert that part of fledgling training into the new streamlined mechanics school which has been grinding out enlisted ground-crewmembers with methodical regularity.

They aren't expert mechanics, these newest graduates of the AAF's new "Training Type Mechanics School for Enlisted Men", but they're definitely on the way, if the Training Center's theory of operation proves correct. And it has--up until now, at least.

The purpose of the short, concentrated two-week course is to teach the basic soldier or newly-enlisted man the approved methods of inspection and maintenance of training planes, and such other technical duties normally performed in the school squadrons of the Training Center. No attempt is made to take the place of the Air Force Technical schools such as Chanute Field, Ill., where a more comprehensive course is presented. The short course was designed specifically to meet the needs of

newly-opened, and opening, schools throughout the vast 31-school Training Center. Each school, in turn, will eventually train its own mechanics.

A mechanic cannot be thoroughly trained in such a short time. However, the fundamental or basic technical knowledge can be given without entering into too much detail. For example, the ability of a student to remove and re-install a magneto or carburetor and to understand the principle of operation and routine maintenance is sufficient. It is not necessary for him to know how to completely overhaul such equipment. With this foundation, he can quickly go on with his learning when he has been reassigned back to his squadron--or should he decide to apply for advanced training at one of the technical schools.

From the time the new enlistee reports at Randolph until two weeks (96 hours of actual instruction) later, he is in the hands of First Lieut. W.C. Holton and his specialist-instructor faculty of 25 non-commissioned officers, each of whom is an expert in his own right. Lieutenant Holton himself is a veteran instructor-mechanic with 14 years of experience, including the eleven years which Randolph Field has been in operation. He has trained over 20,000 Aviation Cadets in mechanics. He received his commission only last April.

Students in the mechanics school are all volunteers, and are chosen by set quotas distributed between Randolph Field and the other schools in the Training Center. "These men," says Lieutenant Holton, "represent the 'forgotten men' of the Air Forces--the basic soldier whose ability would never be recognized if it

were not tapped and brought to the Service in this manner.

"Some of them have never even seen the inside of a hangar, but that's nothing new to us. We make mechanics out of them just the same; all we ask is the willingness to learn."

The curriculum of the course consists of 72 hours of classroom lectures, highly effective visual training film instruction, demonstrations and practice jobs—supplemented by 24 hours of calisthenics and drill. A passing average of 70 must be maintained at all times.

As for the actual instruction, this is roughly divided in the following manner:

Six hours to fundamental engine principles and engine construction; 12 hours to carburetion, fuel systems, and technical orders; 12 hours to ignition, generators, generator control panels, starters, spark plugs, etc.; six hours to hydraulic systems, engine operation (starting and stopping, etc.); nine hours to aircraft construction, landing gear, wheels, and brakes and propellers; 18 hours to practice work on test blocks, such as practice installation of magnetos, carburetors, fuel pumps, fuel pressure relief valves or combination fuel units, controllable pitch propellers and trouble-shooting. The test block period also includes the practice work of performing a complete 50-hour inspection on the engine.

The latter is the backbone of the course—where the student is taught the approved method of inspection and maintenance through the use of inspection forms which may mean the difference between life and death of the man up in the air.

"And they take pride in their work, as the good mechanic does," says Lieutenant Holton. "He may not know the man who flies the plane, but if he can put his own personal stamp of approval on the machine he's just as proud as the man who takes it up."

The school is conducted right on the Randolph flying line, and is held in one of the hangars which is complete with classrooms, practice equipment, and actual training-plane wing and fuselage cut-aways. A complete museum exhibit of motors dating back to World War I helps remind the students of what remarkable strides military aviation has made in the last near-40 years. In the course itself, the student will see service on motors ranging from the 450-horsepower BT-9 to 1000- and 1200-horsepower Allison motors used in the fastest pursuit ships.

In the practice labs he will "ground-fly" a complete ground-built, control-operated "mock-up" of a training plane. He can also trace its entire electrical circuit through every tiny wire and switch; he can go back and trace fuel distribution by a system of glass-enclosed threads which show the direction of movement. He will tear down and reassemble starters, generators, magnetos, and carburetors; he will learn how to moor a ship when no regular con-

crete mooring rings are available. He will do all this and much more.

Then, at the end of his two weeks he will receive his certificate, which usually reaches him the following week—after he has already reported to the flying line of his original field to assume his unheralded job as one of the nine men on the ground who keep one flying.

THE GREEKS FLY ON

INSPIRED by the desire to carry on the struggle against Nazi tyranny and to free their country, the Royal Greek Air Force has been working for many months to prepare itself for the day when it could form independent units to join the squadrons of the Royal Air Forces in the Middle East.

That day has now arrived, and Hurricane fighters, ornamented with the colors of the standard of Greece, will soon be in action on the desert front.

Many of the personnel, both air crews and ground staff, escaped from Greece and Crete during the campaign of the spring of 1941. Others followed when they heard of the formation of a Royal Greek Air Force in the Middle East. The stream of volunteers increases daily, and every man is Greek.

The long period of training presented many difficulties, but schools were established, repair centers organized and clerical and operational branches were formed.

All the pilots flew either on the Albanian front against the Italians or during the German invasion. They are looking forward to a renewal of contact with the Royal Air Force, with which they fought in Greece.

These forces do not represent the total effort of the Royal Greek Air Force. Numerous pilots, ground crews, air gunners, observers, engineers and personnel of all categories are being trained for the expansion that is to come.

In addition, bomber pilots of the Royal Greek Air Force have already helped in anti-submarine patrols over the Mediterranean, for many months. This Unit, which has the cooperation of Greek Naval officers, is also to be reinforced.

--RAF Journal

Small models of German planes are used as practice targets at the Air Forces gunnery school at Harlingen, Texas.

Students at Air Forces gunnery schools practice first on stationary ground targets, then moving ground targets, before taking to the air.

Fifty million square feet of blueprints were turned out during 1941 at Wright Field, which has the largest blueprinting plant in the world. The machines of this plant can turn out enough blueprints in one week to span the earth in a foot-wide circle.

Germany's Messerschmitt

Dissecting the 109



The Messerschmitt 109 is one of the German Luftwaffe's standard pursuits. It is a single seater, low wing, skin-stressed monoplane with a cantilever single-spar type wing. Its E model is powered by an 1150 horsepower Daimler Benz liquid-cooled inverted V-12 motor. A similar type 1200 horsepower motor is used in the F. It carries a three-bladed propeller and mounts a 20 mm cannon and two machine guns which fire forward from the fuselage. Its normal flying weight is 6,050 pounds. Armor protects the pilot's head and back.

The following conclusions on the flying characteristics and maintenance of the 109 were reached by engineers of the Royal Air Force after extensive tests of captured models. The flying characteristics apply only to the E model. No flying experience had been obtained on the F at the time of this report.

MAINTENANCE

EXAMINATION of the ME109 models indicates that great care has been taken by German designers to insure ease of maintenance in the field by crews with a minimum of skill and experience. Inspection doors are liberally provided and are locked by a single fastener of the spring-loaded push button type. The doors open easily without tools and provide a good flush fit when closed. Wing guns are particularly accessible through a large hinged door along the leading edge.

Rigging points for plumb bolts, straight edges, etc., are marked by dome-headed rivets which stand out from the skin and are painted red. There is no adjustment for wing incidence. A simple and convenient jacking arrangement is provided by holes in opposite sides of the fuselage. A bar can be passed through these doors and supported on framework on either side.

The universal use of multi-pin plug and socket electrical connections is an important factor in maintenance. These connections consist of shielded plugs held by wire yokes which are easily releasable by hand. Every detachable sub-assembly involving wiring is served through such connections so that no dislocation of wiring is necessary when the sub-assembly is removed. On the 109F the sockets of all plug connections serving the engine are grouped on a single panel.

No fuses are employed. Their places are taken by a small group of switches controlled by temperature. Tripping any one of these switches is revealed by raising a button on the particular switch; resetting is done by pushing down the button. The time spent looking for and replacing ordinary blown fuses is eliminated.

The combined hand and electric inertia type engine starter is very good and makes starting independent of the electrical system. Engine removal and replacement can be performed very quickly by virtue of the simple standardized mounting and the electrical plug connections.

FLYING

THE general conclusion is that the 109 handles well and has excellent response to the controls at low speeds. But all controls become far too heavy at speeds over 300 miles per hour. The ailerons become virtually solid at 400 miles per hour and maneuverability at high speeds is considerably restricted.

The turning circle of the 109 is also poor. At 1200 feet the circle is 885 feet compared with 696 feet for the Spitfire. This is due to the higher wing loading on the German ship, which is 32 pounds per square foot compared to 25 pounds on the Spitfire. The disadvantages resulting from high wing loading and aileron freeze detract considerably from its fighting qualities, the RAF reports.

These disadvantages are to some extent offset by good performance at high altitude, excellent rate of climb, gentle and amply warned stalls. The 109 has an absolute ceiling of 37,500 feet. Its best rate of climb is developed at low air speed and consequently the angle of climb is very good. The 109 has a direct fuel injection engine which does not sputter or cut out under negative "G" such as occurs when diving suddenly to seek cloud shelter.

The stall is very gentle with no tendency to spin. Ample warning of the approach to the stall is given by aileron vibration and buffeting. Owing to the high wing loading the stall occurs at relatively high airspeeds.

The take-off run is remarkably short and the initial rate of climb excellent. Flaps are lowered 20% on take-off. Landing is tricky until the peculiar feel of setting the tail down is mastered. Wheels are well forward of the center of gravity and heavy braking is possible immediately after the wheels touch without producing tail lift. The 109 can be taxied extremely fast.

The ship has an adjustable stabilizer. Lack of an adjustable rudder results in additional pilot fatigue since there is a large change of

direction rudder trim required at high speeds and continuous application of rudder controls to keep a straight course is very tiring.

Slots open at very high air speed and their opening is accompanied by aileron vibration which is transmitted back to the stick and is sufficient to spoil a pilot's aim in combat and make accurate looping impossible. Vibration stops when slots are fully open.

Lowering flaps produces nose heaviness which is compensated by stabilizer adjustment. Controls of flaps and stabilizer are made by a single handle which automatically makes adjustments for flap lowering.

On the 109E the ailerons are connected with the flaps and come down 11 degrees with them. This does not detract from the effectiveness of the ailerons but makes them feel heavier. This inter-connection is not present on the 109F. A very simple and effective flap position indicator is used. Lines painted on the slotted flaps at 10 degree intervals lie under the trailing edge of the wing and emerge into the pilot's view as the flaps are lowered. Take-off and landing positions are indicated by different colored lines. Flap operations are entirely mechanical by screw and nut gear and avoid the vulnerability of hydraulic systems.

The 109 cockpit is too cramped for comfort. It is too narrow and has insufficient head room and a tiring seat position. The cramped position seriously restricts the force the pilot can exert on the controls, particularly side pressures for the ailerons.

Extreme simplicity is featured in the engine controls. The throttle arrangements are made by manipulating a single lever. Mixture control, supercharger speed, oil temperature and propeller pitch are all controlled automatically.

Instruments are well grouped with flying instruments on the left and engine gauges on the right. There is no artificial horizon. View is generally good but due to the cramped cockpit the rudder can be seen only by turning most of the torso. The cockpit hood hinges along the right side and cannot be opened in flight. A spring catapult can fling the hood clear and the radio aerial mast of the plane to make a parachute escape easier. A panel arrangement directly in front of the pilot provides a two inch, draught free opening for direct vision. This facilitates maintaining high speeds while flying through rain, sleet and snow. The cockpit glass is not bullet proof.

• • •

Personnel of the Army Air Forces base "somewhere in Costa Rica" live in tents with mahogany flooring and sidewalls. Although this may sound ultra-swank, it isn't. Mahogany is the cheapest lumber in the vicinity.

The Costa Rican Air Force base is a section of the Caribbean Defense Command, and the pilots regularly patrol the Pacific and Caribbean in that area. President Rafael A. Calderon of Costa Rica often visits the American flyers.



THE LIEUTENANT'S LAMENT

A lieutenant is an officer,
Or so some people say.
He wears pink pants and shoulder straps
And draws commissioned pay.
But if you pause and ponder
You will see that they are wrong;
'Tis such a cause for wonder
That I've put it into song.

The colonels live in quarters,
The privates live in tents;
By the post commander's orders
The lieutenant merely rents.
The USO gives dances
For the poor enlisted men;
The colonels' wives plan parties
Where each rooster has his hen.
The college girls
Cast their pearls
Before the crude cadets;
But the men of Mars
With single Bars,
'Tis them the world forgets!

To buy their meals they are allowed
Just sixty cents per day,
But they must mess in with the crowd
And ten bits for it pay.
And if a post commander
Does, perchance, provide them quarters,
He builds them out of tarpaper
And living there is orders.
What is the rent?
Oh, it is meant
To provide such quarters free--
Lieutenants merely do without
A forty dollar fee!

Oh, lieutenants they are officers,
Or so some may have thought,
They wear pink pants and shoulder straps
But really they are nought.
They must respect their betters,
And 'tis numerous they are,
Their bars are really fetters
To an eagle or a star ...
Rank without authority,
Duty without power,
Service without glory,
Officer, for an hour!

Lt. Donald E. Super
Maxwell Field, Ala.

ME 109

SIDE ELEVATION



NOTE: WING SPAN
NOT CUT VERY SQUARE

FRONT VIEW



OVERHEAD VIEW

