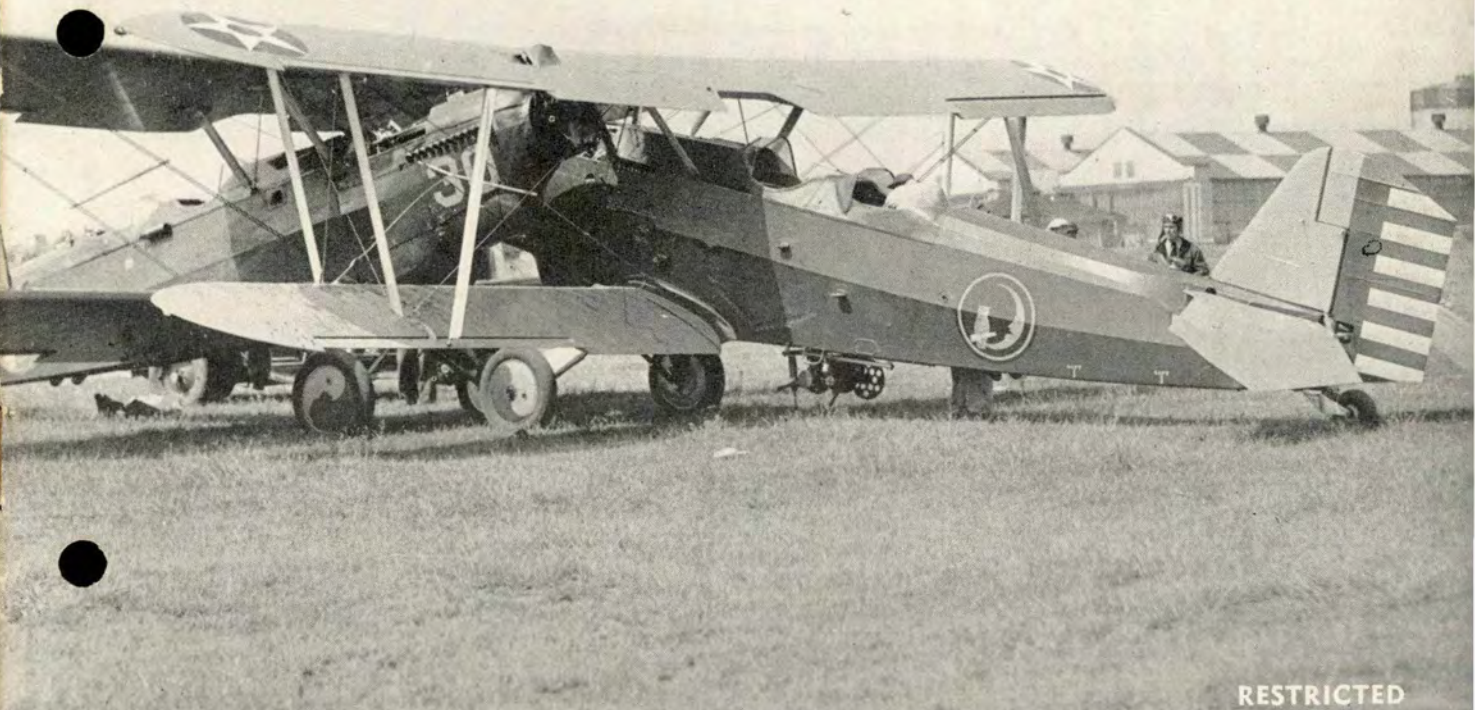
Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED

MAY 1948



RESTRICTED

THE COVER STORY

Taxiing into another airplane for failure to keep an alert lookout is not a new type of accident. The two observation planes shown on this month's cover collided 16 years ago. The same type of accident had occurred before, and is happening repeatedly at the present time. Whether the taxiing accident happened in 1918 or in 1948, the reason is the same. The responsible person's answer is invariably "I didn't see the other plane until too late." The picture adds emphasis to an old problem which is given new treatment in the article "How Can We Improve Ground Handling of Airplanes?" appearing on page 8, this issue.

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DROP US A LINE

If we know what type of stories and articles you prefer we will be able to give you a better magazine. After you have read this issue drop us a card or letter with any comments or criticisms that come to mind. Mail direct to the Editor, FLYING SAFETY, Field Office of the Air Inspector, Langley Air Force Base, Hampton, Virginia.

FLYING SAFETY

Volume 4 No. 5 May 1948

CONTENTS

STORIES

ARTICLES

FEATURES

FLYING SAFETY is printed with the approval of the Bureau of the Budget, Executive Office of the President of the United States.

Direct communication is authorized with the Editor, FLYING SAFETY, Field Office of the Air Inspector, Langley Field, Virginia.

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THE FIRST LINE OF DEFENSE

IT IS WELL KNOWN that a tactical problem in war or in maneuvers is planned, developed and briefed by the higher echelons of command, but it is the small combat unit that is actually in contact with the enemy and executes the plan in a manner dictated by conditions met in the field. This is the "First Line of Defense."

A flying safety program, to be effective, is operated in the same manner. It is the Air Force base, in direct contact with the aircraft accident problem, that goes into action on the general directives and applies locally the fundamental safety strategy of higher headquarters. Should any of these plans prove to be confusing or impractical to carry out, base level echelons should be the first to discover this fact and recommend improvements or corrections to higher authority.

A high accident rate is often the result of a lowering of morale and efficiency. Similarly, as the accident rate climbs, morale and efficiency are reduced. What happens to an organization under these conditions is only too well known.

By arming the organization with the mental and physical weapons needed to combat the "enemy" it is possible to achieve a local success against an increasing accident rate. Some of the enemies of safety, such as materiel failure, can be recognized easily and challenged. Those hardest to recognize are disguised as pilots, maintenance men, or supervisory personnel. These disguises are hardest to penetrate, mainly because they look so much like you and I.

Sometimes a pilot is heard to say that he is afraid of an airplane. Probably he has based his fear on rumor. It may be that a field has had a series of accidents with a certain type of plane, and instead of checking for poor pilot procedure or careless maintenance, the airplane is considered dangerous. This is much like people who fear every snake they see — they haven't learned to identify the poisonous ones. And stories about "deadly" airplanes are, like snake stories, based on rumor and fear. By studying equipment with a view to really understanding it, worries will be replaced by confidence.

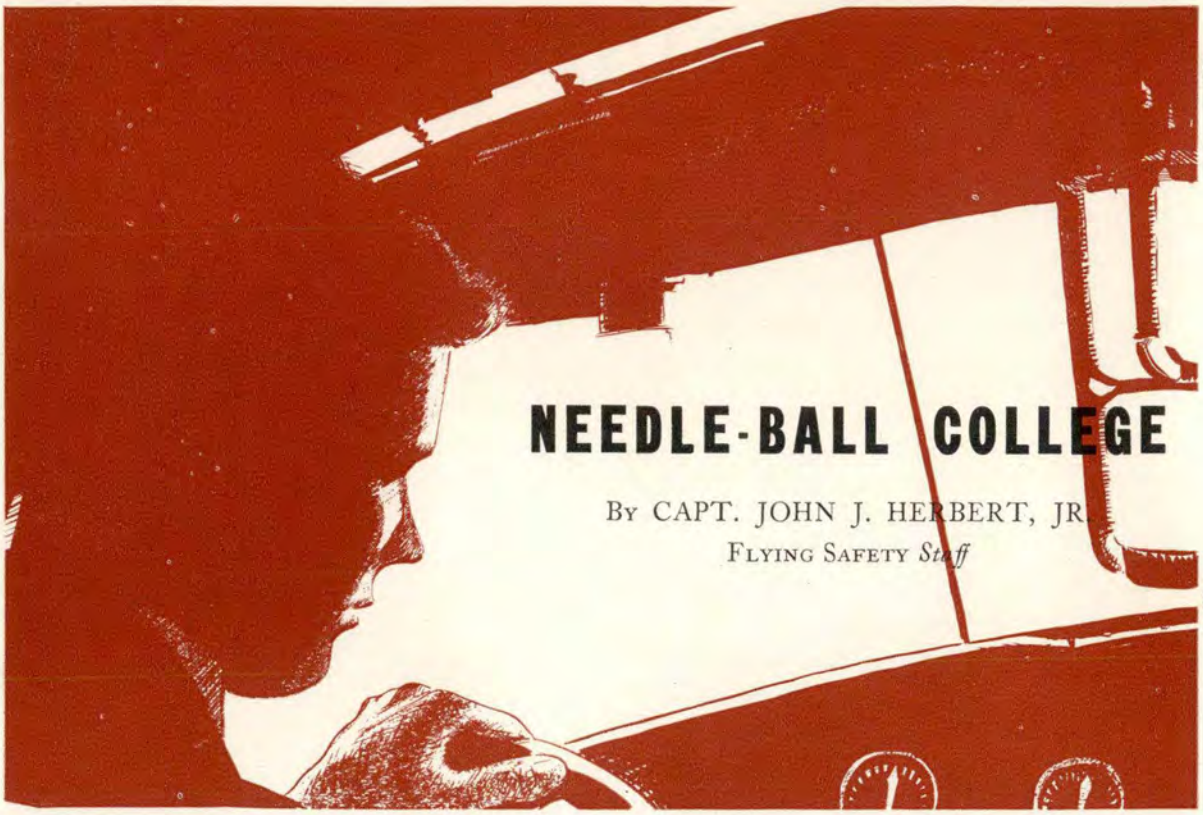
Another enemy on the local sector is an increasing number of petty violations. These, such as cutting others out in the pattern and similar discourtesies, are usually harmless at first. But soon it's every man for himself and the fat is in the fire.

Using disciplinary action as a sword hanging over the pilot's head in place of proper training and supervision is not conducive to steady nerves or good morale. In one case a base had this placard posted conspicuously on instrument panels: "Crack up this crate and you're a dead pigeon." Is that a good safety slogan?

Sloppy operations, careless maintenance and lack of supervision are all allies of an increasing accident rate. Supervisors must take time for local reconnaissance. They can look around and see what can be done to strengthen their position by increasing interest in the work. Pilots can be encouraged to put on a pair of coveralls and help pull 50- or 100-hour inspections. Crew chiefs welcome the chance to acquaint pilots with their maintenance problems which, in fact, are the pilots' problems also. Interest can be built by having maintenance men engage in competition among themselves to develop "the best outfit on the line." Personnel can be cocky without being careless. This is where good supervision comes in.

Instructor pilots can score against accidents by setting up standards of proficiency for checkouts above the minimum requirements. It is not meant that the requirements should call for supermen to qualify, but merely that intelligence, judgment and safety be stressed to the fullest extent.

The obvious solution to the problem of high aircraft accident rates is to build up a well-disciplined, conscientious organization with the wholehearted determination to tackle its own problem.



NEEDLE-BALL COLLEGE

By CAPT. JOHN J. HERBERT, JR.
Flying Safety *Staff*

"From the compass which kept him on his course, his eyes would glance rapidly to the turn-and-bank indicator. Next, to the altimeter, so that he would not get dangerously close to the ground. . . .

"From the altimeter his glance would have to go to the engine tachometer and the airspeed meter, so that he would be warned if the plane was climbing or diving. . . .

"At intervals his eyes would have to pass on to the clock, so that he could estimate the distance to be checked off on his map. When he could find a spare second he would shoot a swift glance at the oil pressure and temperature gages. Thus, the cycle would end — to begin again at once. . . .

"All this while he hurtled along at almost a hundred miles an hour!"

Thus runs the description of the mechanics of blind flying as described by Donald Keyhoe in his book, "Flying with Lindbergh."

Today, some twenty years later, "hurtling along in a B-25 at a hundred miles an hour is still considered something of a feat. The only difference being that today's hundred miles per hour is considered to be dangerously slow.

During the 20-year period since Mr. Keyhoe was gathering material for his book, the Air Force has made tremendous strides in the development of instrument flying, one of the longer strides being the establishment of the USAF Instrument School at Barksdale AFB, Louisiana.

The course of instruction at the Instrument School is of 10-week duration. During this period, the students fly 110 hours in B-25's. Of this total, 55 hours are spent under the hood or in actual weather. The remaining 55 hours are flown as student instructor pilot. These students learn their trade and then spend an equal amount of time getting hep to the technique of instruction so they can spread the gospel of safety gages when they return to their home stations.

The course has been set up in seven phases. In chronological order they are: Basic, 32 hours, Radio Range 13:30, Visual Aural Range 4:30, RDF 18:00, Blind Approach 4:00, Flight Planning and Cross Country 30:00, and Review and Final Check 8:00.

All takeoffs are made under the hood and, when-

A Cadet demonstrates radio range orientation with a synthetic training device at Barksdale. As the "wand" or pointer in his hand is moved over the station represented on the card, signals duplicating those transmitted by a real radio range are heard.

ever practicable, actual GCA letdowns are made. If GCA is inoperative, the instructor acts as the GCA controller and talks the student through a simulated GCA landing.

Each phase is practiced in the C-8 Link trainer on the day preceding actual flight. Intensive instruction is given in procedures to be used the next day in the B-25. The system of using the Link has proven itself to be the best method of getting procedures across. Two students and one instructor are assigned to each Link. As soon as the first student completes the assigned problem, the instructor holds a critique. In this way, both students learn by each other's mistakes. The second student climbs into the Link and his period is followed by a critique. Because the Link is fully utilized, a minimum of time in spent on demonstrations by the instructor in the airplane. The student knows the procedure thoroughly from his Link session and can devote almost his entire period to practice under the hood.

The plague of most pilots has always been ground school. Not so at the instrument school. For one thing, the instructors are the best obtainable. The classrooms in the ground school building are equipped with large scale mock-ups of all types of instruments, computers and radio equipment. Every synthetic training aid is identical to the real thing. Training films are also fully utilized. Before a man is assigned to the ground school as an instructor he must first prove himself as a top-notch flight instructor. Each ground school instructor is required to take a standardization check periodically. Occasionally, each is assigned to fly with students who in turn are checked by supervisory personnel for standardization.

What do the students say about the ground school? Well, the proof is in the pudding. I went over to the academic building to talk to Captain Robert E. Broft who was lecturing on the visual-aural range. I arrived at the door of the classroom about five minutes before the class was due to wind up. I waited and waited and waited. Fifteen minutes later, I got to see Broft. So keen was the interest in his lecture, the students were unaware of the fact that they were running into the next hour of instruction. Recess between classes invariably

finds the students gathered in the hallway in a group with their instructor. Questions are fired at him until he is forced to retreat to his office. Does that answer the question?

The Dean of the Needle-Ball College is Lt. Col. James Y. Parker. Colonel Parker came up the hard way. He took the course as a regular student. After being graduated, he instructed for several classes. His students were constantly checked for standardization as was Colonel Parker himself. He still participates actively in the program, often pinch-hitting as an instructor.

The mission of the instrument school is to train instrument instructor pilots, who will then be assigned to the instrument board at their home stations. In this way, all Air Force pilots will benefit. Colonel Parker expressed the desire that Air Force bases and commands send people who are genuinely eager to pursue the course of instruction at the instrument school. In some instances, and they are few and far between, pilots are assigned in order to fill a quota. It is sometimes necessary to return these people to their home stations because they express no desire to take the course and feel that they were sent only because of vacancies in the quota allowed for their home station.

Another shortcoming of the over-all Air Force instrument training program is the fact that some graduates of the school do not engage actively in the instrument program at their respective stations.

Of the several students who were queried, all were unanimous in acclaiming the cross country phase as the part of the course they liked best. As one major put it, "I am a fighter pilot and I'll admit I was a wee bit shy of flying in the soup. I was more than somewhat nervous when I went on my first weather cross country. I made five letdowns in one day and now I'm convinced it works. Since my class started, we have averaged 15 hours of weather time. Ten weeks ago, I'd have gotten a room in the BOQ but instead I'm now heading home in a P-51 and home is forecasting 500 feet and two miles."

WELL DONE

TO

M/SGT. DON TENNYSON and T/SGT. L. B. KEITH

Albrook Air Force Base

Quick action by two Air Force Sergeants, who, after exhausting the supply of fire extinguishers in a vain attempt to master a fire which had broken out in the bomb bays of their B-17, continued to battle the flames with their bare hands, was credited with saving the airplane and the lives of all aboard on a flight from Albrook Air Force Base, Panama Canal Zone, to Tampa, Florida. One of the passengers aboard was a Congressman returning to the U. S. following an official visit to the Canal Zone.

The two airmen, M/Sgt. Don Tennyson of Comanche, Texas, and T/Sgt. L. B. Keith of Paris, Texas, were aboard the Fortress in the capacity of flight engineer and assistant, respectively, when the accident occurred.

The fire was discovered by Capt. M. H. Bryant of Manhattan, Kansas, who first smelled smoke and notified the pilot, Lt. Col. C. K. Nelson. Tennyson and Keithe grabbed Foamite fire extinguishers and started to work on the blaze which had broken out in a section of wiring beneath the floor of the Fortress.

When the fire was discovered, the plane had just passed over the Atlantic coastline of Panama. Colonel Nelson immediately turned back toward the coast and prepared for a forced landing at France Air Force Base.

The flames gained headway despite the application of foamite and it was then, with fire extinguishers exhausted, that the sergeants ripped up the floor and tore out the burning wire with their bare hands. The flames were brought under control just as the airplane turned on the final approach for its landing at France Air Force Base.

The action of the two men was considered all the more outstanding by other members of the crew in that the fire had broken out at a point just under the fuel transfer valves. The aircraft was carrying 2,700 gallons of high-octane gasoline, making the danger of explosion imminent. The two men, despite this added hazard, did not hesitate to continue to fight the blaze even after all normal methods of in-flight fire fighting had been exhausted.

Colonel Nelson has initiated correspondence recommending that Sergeants Keith and Tennyson each be awarded the Soldiers' Medal.

Sergeant Tennyson has served in the Air Force for nine and a half years. He was in the Asiatic Pacific theater from April 1940 until September 1943. Sergeant Keith has served in the Air Force for the past five years. Both men are on duty with the 3rd Base Complement Squadron at Albrook.

Other members of the crew were: Major J. C. Keene, copilot, 1st Lt. Arthur Weber, navigator, and S/Sgt. Norman E. Harris, radio operator.

T/Sgt. L. B. Keith and M/Sgt. Don Tennyson

ENGINE CO

BY LT. RODGER W. LITTLE,

BACKFIRING, rough engine operation, blown cylinder heads, and impeller sections catching fire are problems that every base has experienced at some time. In many instances, the flight crew cannot combat these difficulties effectively and is forced to make an emergency landing—sometimes with disastrous results.

Engineering officers can hold such accidents to a minimum by proper and detailed preventive maintenance. "Engine conditioning" is the answer. It isn't anything really new, but is a gathering of all of the best methods known into a systematic and logical application of existing maintenance practices.

An engine which is structurally sound will operate satisfactorily and with a minimum of maintenance when *all* of its parts are adjusted properly. When any one of these adjustments is incorrect, a

set of variables may develop which might become very confusing when attempting to locate the trouble. Such variables include cylinder compression (indicating ring and valve setting), valve clearances, timing of spark, ignition harness, spark plugs and proper fuel-air ratio. Engine conditioning provides for a system of checks to enable a correct interpretation to be placed on the functions of the parts singly and together.

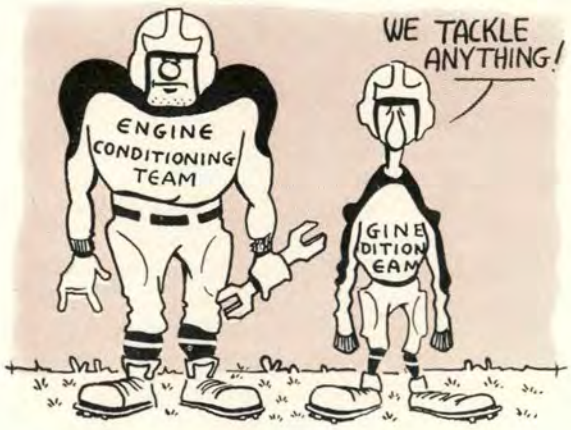
It has been established that much of the corrective maintenance now performed on aircraft engines can be eliminated economically if proper preventive maintenance procedures are used. For example, the majority of spark plug difficulties or rough engine operations are due to improperly adjusted idle mixtures and to improperly adjusted engine valves. Hence, the Air Force must either continue to replace spark plugs at an expensive rate or eliminate the cause of spark plug failure.

Also, the improper adjustment of idle mixtures often requires a higher rpm for ground operations resulting in fast and dangerous taxiing, an excessive use of brakes, or both.

The Air Materiel Command has trained crews in engine conditioning for all Air Materiel Areas and for special instruction in the Air Training Command specialized schools. Likewise, selected personnel from other USAF commands have been given training at Wright-Patterson. As a result, teams are now in the field giving on-the-job training in the art of engine conditioning.

A "Packet" full of trouble was recently turned over to an engine conditioning team after maintenance personnel at a certain USAF base admitted defeat.

This particular C-82 first caused trouble when both engines started backfiring in flight. After landing, the spark plugs were changed and the Packet test-flown with little improvement in the performance of either engine. Carburetor trouble was the next guess. So both carburetors were changed. Another flight test indicated no improvement in operation. They tried the spark plugs again and main-



tenance personnel changed plugs a second time. In the next flight, backfiring was still noted, so the magnetos were changed, resulting in a fourth test hop and no improvement.

NDITIONING

FLYING SAFETY STAFF

The ignition harness was the next to be changed. Then came the fifth flight with no favorable results. As maintenance personnel proceeded to change spark plugs for the third time, nerves became a bit frayed and the situation between pilots and ground crew anything but calm. To ease hard feelings, maintenance personnel flow-tested the carburetors and found them to be on the rich side. New carburetors were requisitioned and installed. Back from another test flight came the pilots. Still not satisfactory. So another new set of spark plugs were installed. On the eighth flight and with the fourth set of plugs the engines were still backfiring.

An engine conditioning team was called upon the scene.

The team reviewed the previous maintenance action and found that it had consumed three weeks, 250 man hours, six carburetors, two magnetos, two ignition harnesses, 288 spark plugs and had required fruitless test flights with accompanying pilot vexation.

Two members of the engine conditioning team went to work on the C-82. A complete cockpit check was first. Since efficient trouble shooting makes it desirable to duplicate or simulate the actual

trouble with a ground check, tests were made on single ignitions with carburetor mixtures in auto lean. The ground tests paralleled the previous flight tests. The backfiring, cylinder head temperature, carburetor air temperature and mixtures were the same.

Results of these tests indicated that a complete conditioning of both engines was necessary. One phase of engine conditioning was done at a time, thus obtaining a better indication of the cause for the backfiring. The team's routine of conditioning checks was as follows:

1—Cylinder compression. 2—Valve adjustment. 3—Ignition system (magnetos). 4—Spark plugs (yes, spark plugs). 5—Ignition harness. 6—Cold cylinder check with the "Magic Wand." 7—Fuel-feed valve. 8—Vapor vent lines and vapor elimination. 9—Intake pipes. 10—Primer and drain lines.

From these the cause of the backfiring was determined to be marginal ignition system adjustment and

improper fuel distribution between cylinders caused by varied valve clearance. This resulted in one or more cylinders being lean enough to backfire. Simple!

Again the pilots flew the Packet. Both engines worked perfectly. The conditioning of both engines had required 160 man hours and one set of spark plugs which were later removed and replaced by the old ones which also worked without backfiring.

Once an engine is conditioned completely it requires the cooperation of both ground and air crews to keep an accurate running check on its condition. That's engine conditioning.

(EDITOR'S NOTE: For a complete description of the use of the Magic Wand, consult T.O.'s 03-5E-5 and 17-15CF-1. Technical Orders 02A-1-29, 02A-1-88, 02A-1-89 and 02A-1-90, which were distributed in February, 1948, cover in detail the engine conditioning procedures.)

HOW CAN WE IMPROVE THE GR

By COL. J. A. WILSON, *Chief, AMC*

(Editor's Note: In repeated visits to most Air Force Bases in the United States, Colonel Wilson has noted an alarming number of malpractices in the methods of handling airplanes on taxi strips and on the parking ramps. These unsafe conditions prompted him to write the following suggestions and comments. Flying Safety welcomes this type of contribution in the belief that it can help reduce the taxi accident rate.)

The taxi accident as a result of lack of wing men is too familiar. And in most cases the pilot is criticized because he did not employ wing men. It has been my experience that with the possible exception of the period covered by the normal week day duty hours, wing men are apparently never voluntarily available at AF stations.

The taxiing of an airplane, especially at night, is complicated in the case of all types without nosewheels, because of poor forward visibility. Frequently the "S"ing of a single engine airplane can be accomplished only in a very limited way due to insufficient room on the ramp, difficulty of taxiing in a crosswind, and obstructions in the taxi path such as chocks, fire extinguishers and snowbanks. Aircraft-parking personnel are often inexperienced and incompetent. It may be that they have never been given proper instruction, which is a reflection on supervisory personnel.

A pilot must either put full trust in the parking personnel, or ignore them completely. He can't watch their signals at the same time he is looking for obstructions.

In twin or multi-engine aircraft the pilot sits on the left and, if parking personnel can't see him, he can't see them. All signals should be visible to the pilot as the man in the right seat may be a person who is not familiar with parking signals or taxiing procedures.

In guiding aircraft to the parking area, follow-me jeeps should use different procedures for tail wheel airplanes as compared with nose wheel airplanes. Pilots in nosewheel airplanes can see the jeep at all times, consequently, the jeep can proceed down the middle of the taxi strip or ramp. Pilots in tailwheel airplanes cannot see ahead unless the airplane is "S"d from side to side, therefore, the jeep driver should favor the left side of the taxi strip or ramp so the pilot can keep him in sight.

Alert crewmen should not bring the airplane any closer than 25 feet to the parked jeep when the airplane is being spotted at the gas pit or in its parking spot. This is because wet or snowy ramps or slip-

OUND HANDLING OF AIRPLANES?

Liaison Section, Office, Deputy Chief of Staff, Materiel

ping brakes will frequently let the airplane slide forward a few feet while props are being placed in low pitch or oil dilutions are being applied.

Windshields and canopies sometimes become fogged or frosted during taxiing and a pilot has a most difficult time getting out of a congested parking area. Wiping the windshield does very little good because it fogs up again in just a very few seconds. Inclement weather makes it impractical to attempt to taxi with the canopy open. Even if this is done, visibility to the right, for example, is nonexistent while the pilot is looking out the left side. Under these conditions personnel in the tower can be of great assistance. Unless there is a considerable amount of traffic, the tower operator should be required to warn a pilot of his approach too close to any object that could result in an airplane accident, considering, of course, the ability of the tower operator to see the particular hazard. At night, for example, the tower operator usually has a better view of the ramp and the location of parked aircraft than does the pilot taxiing an airplane equipped with tailwheel.

It would be of great assistance if alert crews would remain within sight of the pilot until such time as the airplane has taxied out of its parking position and has started moving down the cleared taxiway. Where sufficient personnel are on duty, the pilot should be conducted out to the vicinity of the takeoff runway by the follow-me jeep. At the majority of Air Force stations, sufficient transient aircraft alert crew personnel are on duty, but are often reluctant to leave the lounging room.

In my estimation there is too great a tendency to place the responsibility for ground accidents on pilots, when actually a considerable part of the responsibility should be placed on the commanding officer of the base.

It is admitted that it will be most difficult to have an accident investigation board, under the jurisdiction of the base commander, reach a finding that the base commander was responsible for the accident. It is believed, however, that until some such arrangement can be worked out, the responsibility for accidents will never be placed where it belongs. The expression "supervisory personnel" is too vaguely used in a great many instances in placing responsibility for deficiencies. It should be placed squarely on the commanding officer who is in an excellent position to take drastic action against his supervisory personnel if they are neglecting their assigned duties.

The flight doesn't end on the runway, it ends when the plane is parked.

everybody talks about it . . .

GOOD WEATHER FORECASTING and briefing constitute an important phase of air safety. Air Weather Service is actively aware of the vital consequence of its work, as a protecting shield against what is sometimes a bad enemy—weather.

Air Weather Service became a part of the US Air Force over ten years ago—in July 1937, but did not meet its major test until the demands of war began to assert themselves nearly five years later. It was then that the United States stepped up its air operations and began to flood the skyways with planes carrying men and tons of equipment to the ever-widening theaters of war. Through the probing insight of the weatherman, Air Weather Service sought to cushion this great air armada against the weather dangers inherent in traversing wide expanses of land and sea over distant and unfamiliar places. Indeed, it became a job of the first magnitude to search out and find the storms, plot their course and intensity, and map the least hazardous passageways through the elements.

In 1942 a tremendously heavy concentration of air traffic was passing over the North Atlantic ferry routes through the arctic and sub-arctic regions, so routed because of the shorter distances and to avoid enemy contact. Initiating a program to explore this vast, little known cradle of our weather, AWS undertook its first aerial reconnaissance mission in August 1942, tracking the weather pattern to the far north. This was followed during the next year with a series of reconnaissance flights over the North Atlantic ferry routes. The program soon began to pay off in rich dividends of valuable information, and units were organized and trained for every theater of operation. Tactical aircraft were modified for reconnaissance use and flew target, strike and hurricane reconnaissance, depending upon requirements.

Today, four squadrons of B-29's converted into weather stations range over the Arctic, tropical and oceanic areas. A routine flight, known as the Ptarmigan Mission, is now run to the North Pole and return as often as three times each week, by the 375th Weather Reconnaissance Squadron based at Fairbanks, Alaska. In an area far removed another squadron, the 373rd located at Kindley Field, Bermuda, is likewise contributing important service in hurricane reconnaissance.

Last fall this squadron tracked two hurricanes of particularly severe intensity and kept the Air Force and the public informed of their position and movements. In addition to the public service involved in preventing life and property loss, through the sounding of warnings, these flights add valuable information to the overall weather picture.

In its world-encircling operations, though considerably curtailed in proportion to peacetime commitments, Air Weather Service maintains more than 200 weather stations, organized under two Wings, nine Groups and 14 Squadrons, to observe, record and analyze meteorological data; and to prepare and distribute it through the Airways and Air Communications Service for the use of all National Defense agencies. A working agreement is established whereby information is exchanged with the Navy, the US Weather Bureau and the national weather services of foreign countries. The composite data becomes the basis for routine forecasts.

In a typical project—the PACUSAN DREAMBOAT flight from Hawaii to Cairo, Egypt, via the North Pole—almost every weather tool and type of facility was brought into play, surface reports, upper air studies, reconnaissance flights, long-range forecasts from the Washington Weather Central, short-range forecasts from Hawaii and other points along the route, and the world-wide weather communication network.

To meet the increasing demands for even greater perfection in instruments, facilities and techniques, constant research is being conducted in collaboration with the Navy and the Weather Bureau. Successful strides have been made recently, for instance, in the wider and more effective use of radar and electronics in storm detection. It is now standard procedure to use radio direction-finding techniques to identify winds aloft, radar to detect storms, ultraviolet light to measure cloud ceilings, and special radio sets to locate atmospheric discharges of electricity.

All of these activities plus many others of equally vital importance, play their part in producing better technique—to insure the best available knowledge of weather for safe flying.

THEY DO SOMETHING ABOUT IT!

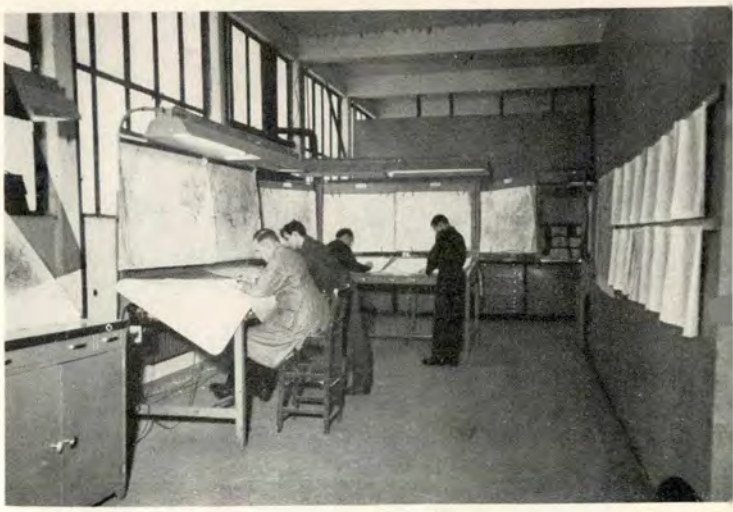
But to do the job requires a special skill. Air Weather Service demands the services of highly trained technicians, thoroughly equipped with the special scientific knowledge to function as a team of experts. Accuracy and precision on the part of every man is of paramount importance, because the work of each, no matter how seemingly inconsequential, fits into its special place in the master pattern like a finished mosaic.

The two basic specialists of Air Weather Service are the weather observer and the weather officer. The prerequisites for training in these two specialties are necessarily high. Officers must have three years of college, including mathematics through integral calculus, and one year of college physics. Enlisted men must have an AGCT score of 100 or better. For training beyond the observer and operator levels, they should have a good background in physics, albegra and trigonometry, and experience or training in electronics. In a recent Air Force-wide AGCT testing of the enlisted men, the entire list was led by weather forecasters with an average score of 136.7.

Basic training as a weather training officer is a requisite for all other weather specialties, such as oceanographer, upper-air analyst, hydrologist, climatologist-statistician, ballistics, radar, SFERICS (static direction finder), tactical warfare meteorologist, and aircraft observer. Training courses in the last four specialties are available in Army service schools, while all categories are covered in civilian educational institutions. Requirements for this additional training include a BA or BS degree, plus a college major in mathematics, engineering or a science.

The rigid requirements in screening and training the men to do this huge AWS job are never relaxed, and, in addition, for those already on active duty all possible care is exercised, through on-the-job training and special schooling, to insure the continued high level of proficiency envisioned in the Air Weather Service program.

In the manner of a medical doctor, the approach is scientific. And like a doctor, life itself, in addition to enormous values in property, depend upon the best employment of this science—to the end that the utmost in service and safety may be realized.



CRASH SURVIVAL

A SAFETY BELT's primary purpose was once considered that of holding a pilot in his seat when the plane was upside down. It was thought that too strong a belt would cut him in half if the plane crashed.

Because of the numerous survivors of comparatively severe crashes, the primary function of a safety belt is now recognized to be that of holding the body so that it will not fly forward with the full velocity of the plane in a crash and ultimately smash against the structure that has already stopped. The photos on this page are typical of crashes in which there were no serious pilot injuries. Credit goes to the proper use of safety belts and shoulder harness.

Details of many crashes have been studied, and the conclusion is that the safety belt itself rarely causes injuries. Along this line, studies of the National Research Council and the Armed Forces tell an amazing story of the body's ability to tolerate deceleration. Portions of the body that are stopped by the safety belt have been found to withstand decelerations up to 25 G's without serious injury! On the other hand the upper parts of the body, particularly when shoulder harness is not used or fitted properly, retain the full velocity of the crash as they strike against the cabin. These observations add emphasis to Air Force Regulation 62-3 regarding wearing a safety belt with shoulder harness.

Belts capable of holding 2,000 pounds were long considered the maximum force which could be applied to a pilot's lap without injury. But records show that persons weighing as little as 115 pounds have torn this belt in crashes. Now a holding capacity of 4,000 pounds has been suggested as the safe minimum. A weak belt, while it may absorb much of the force of the crash before parting, actually has been found to flip the pilot so that he will plunge head first into the forward wreckage.

An easy way to picture why the head striking objects in the cockpit is responsible for so many fatalities is to accept the fact that the human head is in reality a ten-pound weight. Because of its weight, it strikes with a sledge-hammer blow when it flies forward and smashes into cabin structure. Either the head or the aircraft must give. The kind of structure the head hits determines whether the injury is minor, moderate or fatal. A head with an estimated impact velocity of up to 100 feet per second can be stopped in a few inches without dangerous injury if it strikes light, yielding structures.

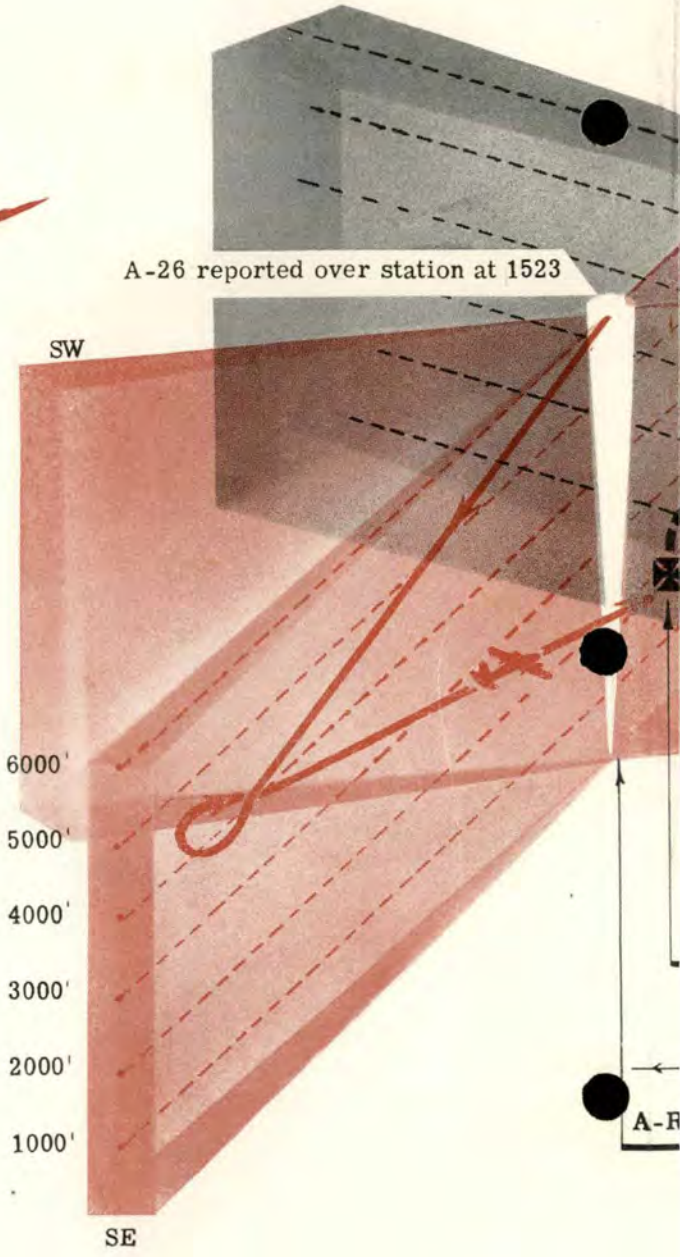
Today's military planes are anything but flying mattresses. Until some radical way is found to soften them or otherwise ease the shock of any sudden stop, proper use of the safety belt and shoulder harness is the best crash insurance.

WHERE HABITS ARE FORMED

With the use of the AT-6 in primary flight training, now called Basic Phase I, the aviation cadet is schooled constantly in the importance of accurate pre-flight checks and precise cockpit habits. The student learns by imitating his instructor, and at Randolph AFB it is considered of primary importance that the instructor be capable of demonstrating precision and procedure to the cadet in training.

Attention to regulations ranks foremost among the precautions taken in the training program. The cadet is taught the importance of personally checking the airplane and his equipment before every flight. He learns the correct use of radio and the rules for air traffic. Because Randolph operates on the concept that a properly-planned program, properly supervised will produce the least number of accidents, the cadet acquires safety habits that will be valuable throughout his flying career.

Collide Path



THE ANCIENT ADAGE that two is company, three is a crowd does not apply in radio range orientation and letdown. Two becomes a crowd when one pilot or both fail to follow the prescribed procedures.

Recently, a B-25 cleared by ATC and the tower to make a standard instrument approach to an Air Force base collided with an A-26 also making an instrument approach — over an Air Force station 35 miles away. The Mitchell was descending on the initial approach leg apparently with no regard for standard letdown procedures.

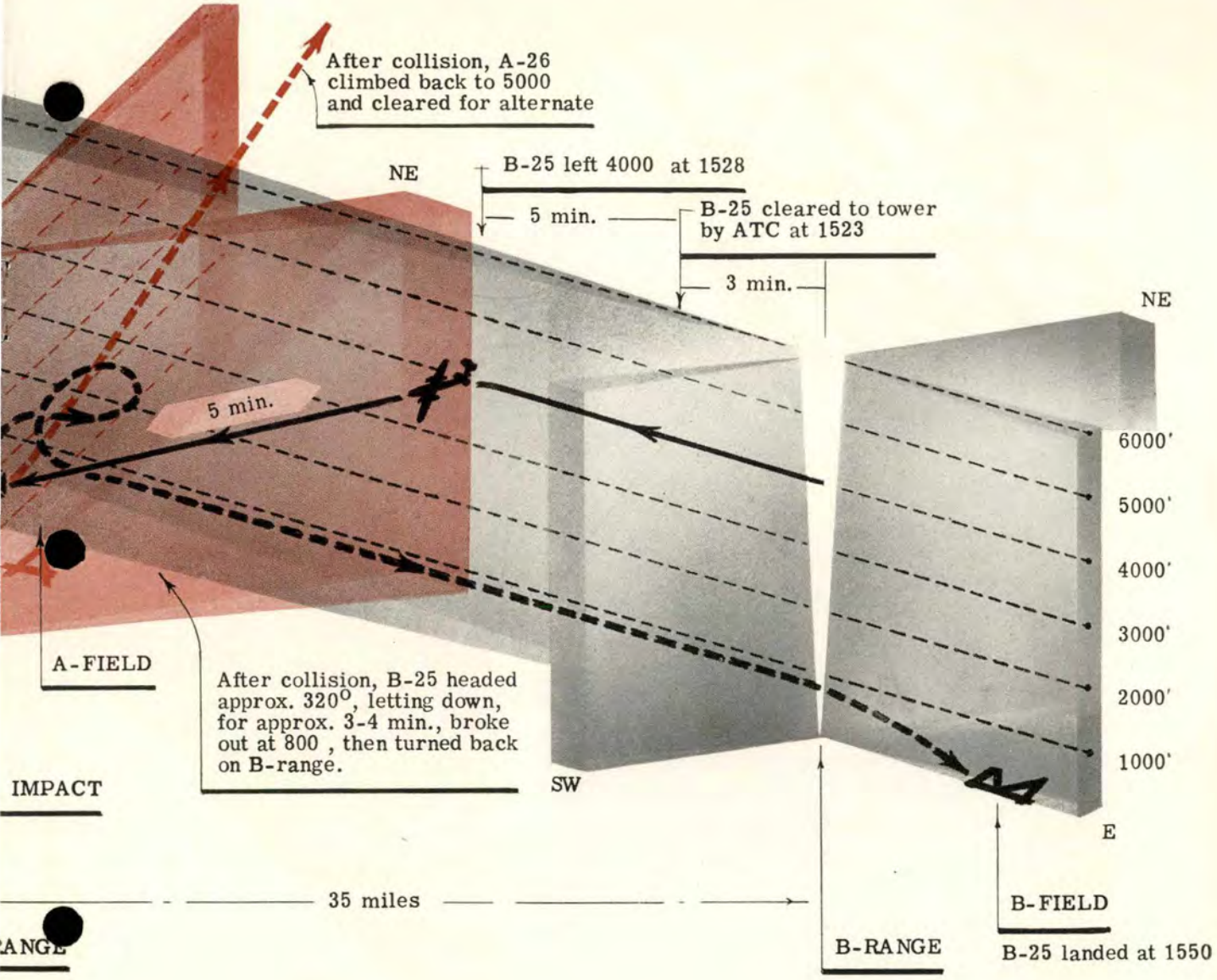
The B-25 pilot was descending 500 feet a minute outbound at 180 mph when he saw a blur. Before he could take any evasive action, he felt a terrific impact. He regained control of the B-25 and continued to descend until VFR. After determining that the damage to his airplane would not affect its flight characteristics he proceeded VFR to the field and made a normal landing.

The A-26 pilot climbed immediately to 6,000 feet where he broke out on top. Because of a damaged elevator, abnormal control pressures were necessary to maintain flight at cruising speeds. However, reduced airspeeds seemed to correct this situation and the A-26 was flown to the alternate airport for a normal landing.

At the time of the collision the B-25 pilot was on the initial approach leg 13 minutes from his range station. The time-distance table inside the cover of T.O. 08-15-3, AF Instrument Letdown Procedures, prescribes eight minutes as the maximum safe distance from this station at 180 mph. That allows a safety margin of 10 miles when letting down on this particular range.

Does hearing about this type of accident make you wonder? Are you thinking of how many times you may have been in the proximity of another airplane during instrument flight? Of the times you have put yourself in the same position because you ignored the prescribed let-down procedure? Or do you feel that there is plenty of room for all, and that this accident is one in a million? If you believe the latter you'd better change your heading because you're pointing for trouble.

Any letdown procedure consists of a prescribed series of maneuvers executed in a standard sequence, designed to bring the pilot, flying on instruments or on top, down through the overcast into conditions



of ceiling and visibility which will permit the landing to be completed under visual contact conditions. Ceilings at the airport must, therefore, be as high or higher than the minimum altitude specified in each instance.

As soon as the range station is crossed by the aircraft headed toward the procedure turn, speed is reduced to the rate proper for the type of aircraft being flown, and altitude is reduced to that specified for the procedure turn.

Then the procedure turn is made at the altitude specified, and in no instance beyond the time in minutes converted from the prescribed mileage indicated by the dotted line in the vertical view of the letdown procedure and the table inside the front cover of T.O. 08-15-3. Upon return to the on-course signal, at a heading toward the range station, altitude is reduced to pass over the range station at the final approach altitude. Timing to the field commences as the aircraft crosses the range station. Further descent to minimum altitude is now made and visual contact with the ground should be established at or before reaching the minimum altitude.

If visual ground contact is not established, an im-

mediate climb must be made to the altitude specified by the missed approach procedure. If no missed approach altitude is specified, climb must be made to the emergency altitude. Report of a missed approach must then be made to the control tower or other ground radio station.

You can readily see that there is much more to making an instrument letdown than just descending on a heading until visual contact is made with the ground. These procedures are designed to help the pilot accomplish his job safely, and with the least possible delay. A thorough knowledge of a few of the more important points in range work would have prevented the B-25 and A-26 collision.

Check the definitions below (they're right out of the book) and see if they jibe with your knowledge of range orientation and letdown procedures:

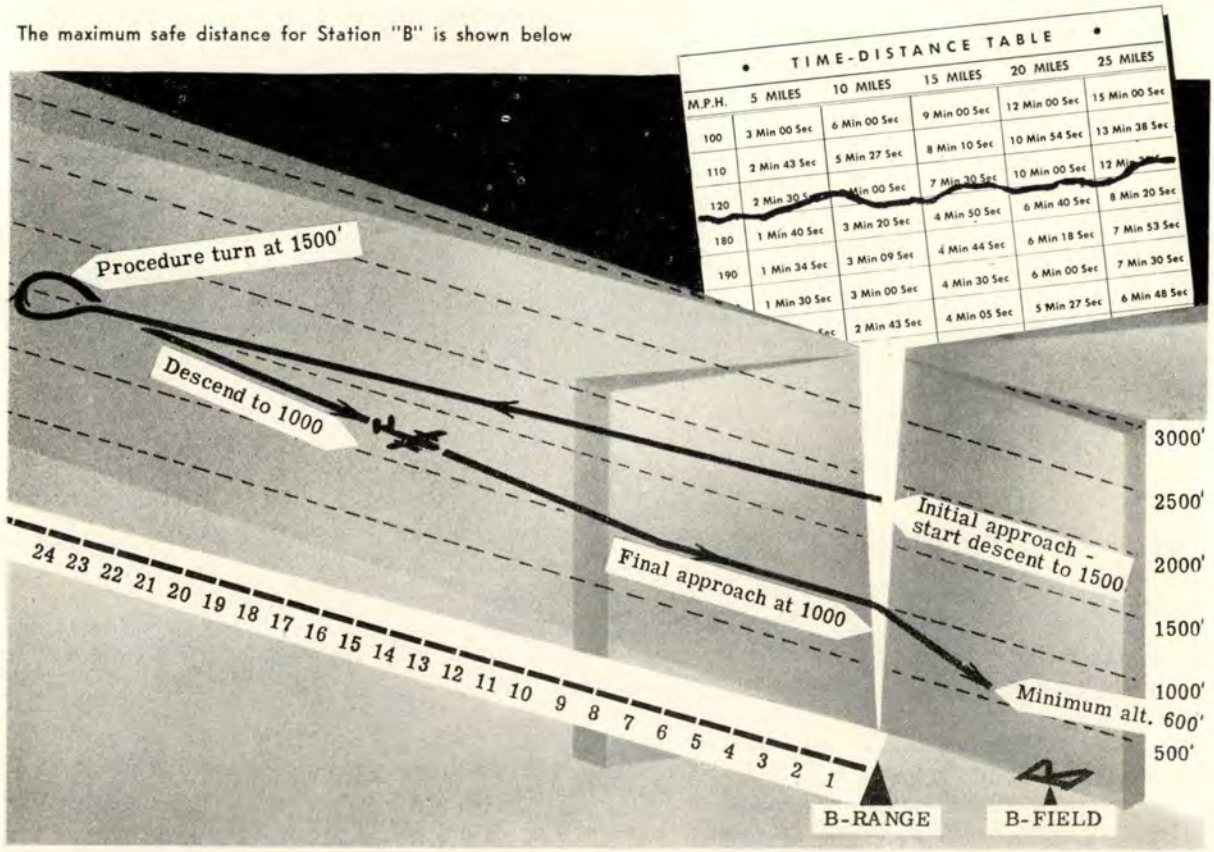
A procedure turn is a standard rate turn and is executed by turning off course 45 degrees in the direction indicated for 45 seconds, and making a 180-degree, one-minute turn away from the station to return to the on-course signal and establishing a heading toward the range station. The initial 45-degree turn normally will be to the left and will cross the on-course signal. The altitude specified for the procedure turn is calculated to insure 1,000-foot terrain clearance throughout the maneuver.

Final approach altitude applies to that altitude over the range station which will clear by at least 500 feet all terrain and obstacles between the place where the procedure turn may be completed and the range station. The final approach altitude will in no case be less than the minimum altitude authorized for the airport.

Minimum altitude is the minimum safe instrument flight altitude for an approach to the airport after crossing the range station. The pilot should be in visual contact with the ground at or before reaching this altitude. If visual contact is not established at the minimum altitude, an immediate climb should be commenced and the missed approach procedure followed.

Remember: Don't exceed the time and distance limits! Stay in your own backyard! If you don't, you may suffer the penalty for poaching on someone else's premises.

The maximum safe distance for Station "B" is shown below



VIOLATION!

A PILOT PREPARED to make his first flight in a P-51 since his return to active duty. His only briefing on local weather was that he had heard someone say that the weather was expected to hold good for the remainder of the afternoon. This pilot did not possess an instrument card and he had flown an AT-6 for only 5½ hours since his return to duty. Giving the usual preparations little thought, the pilot taxied out, preflighted his airplane, and made a normal takeoff.

As the pilot carried no maps of the local area, he decided to stay close to the field. After flying fifteen minutes on a heading of 220°, he made a 180° turn and headed back toward the base. When he had held this new heading 15 minutes, he discovered he was on top of an overcast. He made no attempt to contact the tower.

The P-51 pilot flew a course of 0° for approximately 15 minutes, all this time looking for a hole through which to let down. No breaks could be found, so he flew east for approximately 20 minutes in another attempt to find a break in the overcast. Becoming slightly anxious about his predicament, he attempted to contact a radio range station, but found that his receiver was not operating. At this point the pilot let down through the overcast and broke out at 500 feet. Unable to determine his position while contact, he elected to climb back on top.

After he started to climb back through the overcast his eyes left the instrument panel for a few seconds. When he looked at the instruments again, he found himself in a steep turn. An unsuccessful attempt was made to level out. The pilot said he pulled back on the stick to put the airplane in a climb and then noted that the vertical speed indicator showed a rapid descent. Believing that he was flying in an inverted position only 400 or 500 feet above the ground, he bailed out.

A civilian, who witnessed the crash, stated that the airplane came out of the clouds upside down slightly nose low. The airplane crashed on the edge of some woods.

The only planning that went into this flight was the reserving of a flying machine to be flown at a predetermined hour, PERIOD. The pilot was in no way briefed on the existing or forecast weather.

A few of the more serious violations committed by this pilot were: He made an unauthorized instrument flight, performed an instrument letdown from an unknown position without proper clearance, and flew an aircraft on instruments without a 200 to 400 KC receiver.

The people who really fumbled the ball were the supervisory personnel at this particular base. Since the pilot's proficiency was known to be low, he should have received special attention until his flying ability was regained.

VHF NOSING OUT LOW FREQUENCIES

STATIC AND SEVERE overcrowding are forcing civil aviation off the low frequency radio spectrum. The CAA is converting most of its communications and air navigation facilities to very high frequency, or VHF as it usually is called. Intensive combat use of VHF by the Air Force and the Navy during the war proved its advantages—freedom from static and most forms of interference, light weight equipment and reliability with lower power.

Installation of VHF civil communications equipment on the ground, such as in control towers, will be completed by about 1949. Soon thereafter, the CAA expects to have new VHF ranges in widespread operation. Low frequency equipment will be operated for a number of years in order to make the changeover to all-VHF as painless as possible for the private pilot.

MINIMUM ALTITUDES RAISED

Because of the number of accidents in which planes have failed to clear high terrain, the Civil Aeronautics Board has raised the minimum en route altitudes in mountainous areas. The minimum instrument altitudes over mountainous terrain are now 2,000 feet instead of 1,000 feet. Night visual flight in unlighted areas must now clear terrain by 2,000 feet as well. The minimum day VFR clearance has been boosted from 500 to 1,000 feet.

The new regulations, which apply to scheduled and non-scheduled commercial carriers, were ordered to provide a greater margin of safety in those areas or under those conditions where miscalculations, altimeter errors, or unusual weather conditions may result in insufficient clearance at the previously established minimum altitudes.

WORKHORSE GETS NEW LEASE

The Douglas DC-3, veteran workhorse of the airlines, and most widely used plane on domestic air routes, will be flying the airways for another five years. Originally scheduled to become obsolete at the end of 1942, the plane's airline usage was extended by the war, and its longlife was demonstrated in rugged flying assignments as the C-47 military transport. The Civil Aeronautics Board has now approved civil use of the plane until the end of 1953. The DC-3 was first put in airline use in 1934, making it a 19-year-old workhorse when it finally will be put out to pasture.

NAVY FLYING DOCK

A new seaplane dock which is transportable by air has been developed by the Navy air arm. The dock is large enough to accommodate the Navy's 72-ton Martin Mars-type flying boats. It can be unloaded from air transports and assembled by an experienced crew in from four to six hours.

GIT THAR FUSTEST WITH THE MOSTEST

Airplanes especially designed for the assault roles they must fill in the initial stages of an airborne-troop carrier attack have been announced by the Air Force and development work is going ahead on two of particular interest. They are the C-125 Northrop Raider and the C-120 Fairchild Pack-Plane.

Assault transports are an entirely new type of military airplane which may be used for establishing "airheads"—a task previously performed by paratroopers and gliders. First announced was the military version of the three-engined Northrop Pioneer, and the Air Force has ordered 23 of these new short-field transports. Its ability to pack heavy loads into and out of small, unimproved fields, has opened up new tactical uses for airplanes, it has been disclosed. While 13 of the new Northrop Raiders will be devoted to tests as assault transports, some of the others are to be used for arctic rescue operations. Their ability to take off in as little as 500 feet is expected to prove valuable in frozen wastelands. The planes are to be equipped with either heavy duty fixed gear for rough landings or skis for snow and ice.

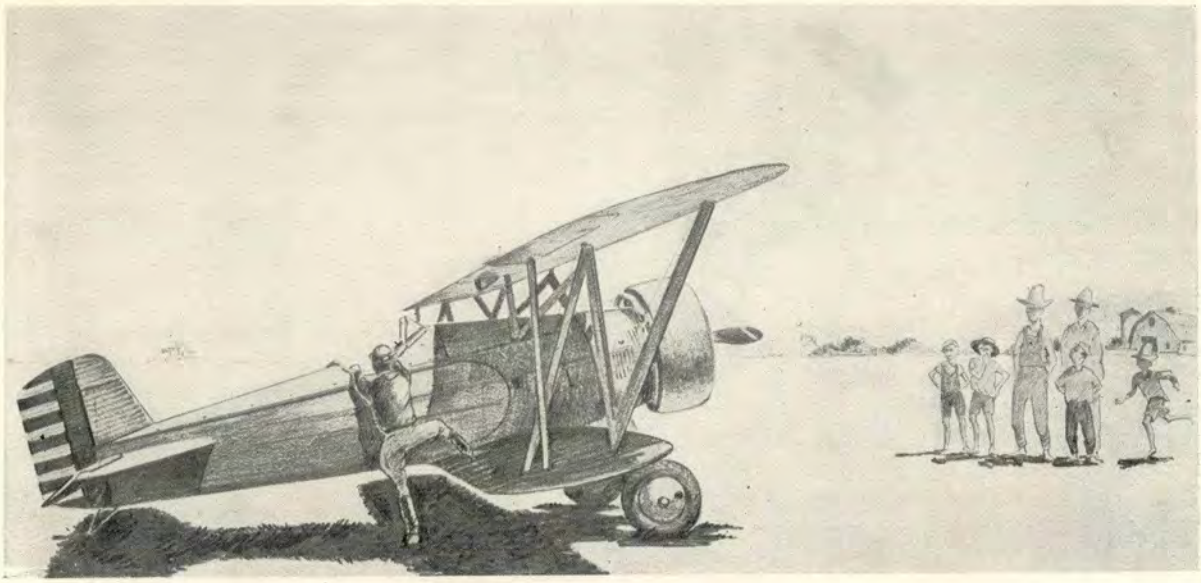
To facilitate ground handling of vast amounts of equipment, military strategists have long advocated a detachable fuselage. Study has also been given to dropping the pack in flight with parachutes or skidding it off on the ground from low altitude. In line with this thinking, Fairchild engineers have designed the Pack-Plane from the standard troop carrier C-119 Packet.

Based on the trailer-truck principle, the plane itself is intended to serve as the air tractor, flying with or without its cargo pack. Since the packs can take almost any form, they will present infinite possibilities for the transport of supplies and personnel to the front line or airhead. Such facilities as communications trailers, portable mess sections, and flying surgical units can be designed within a pack.

The Air Force has contracted for the development of a pack with a nine-ton payload capacity for a 2,000 mile range.

SOLAR RADIO NOISE

The decisive stages of World War II were fought during a period of minimum solar activity, and consequently radio reception was good. But now, after several years of relative inactivity, the sun has begun acting up again, and among the results are magnetic storms and radio fadeouts. These are said by scientists to follow or accompany the appearance of large hydrogen flares on the sun's disc. The newly-discovered radio noise, according to Harvard University meteorologists, is definitely of solar origin. The noise blasts come from active sun spots.



"NONE, SIR"

By CAPT. JAMES L. DUMAS

HE HAD BEEN plowing since before sunrise. When he heard an airplane engine, he stopped. His eyes soon located the tiny, two-winged speck that was playing tag with the beautiful cumulus clouds in the sky. As he leaned his skinny frame against the plow handles, Jim Baker knew that the tall, handsome Lt. Wayne McCauley he had seen in Judsonia the day before was at the controls. Lt. McCauley didn't realize it, but he was the hero of Judsonia and Jim's idol. Each time the lieutenant landed in Beale's pasture, the word spread and Jim was soon there admiring the wonderful plane and the superman flying it.

Jim had had one ambition as long as he could recall. He had to be a pilot in the Air Corps, as it was called in those days. Nothing would stop him from realizing that ambition. All through that day, Jim kept thinking of the day in the future when he too would wear that handsome uniform like Lt. McCauley's. Maybe he could fly with the lieutenant. He might even buy a Moon convertible like the one he saw Lt. McCauley driving when he was home on leave.

Jim was still day-dreaming when he unharnessed and started feeding his mules. As he climbed the ladder to the hayloft, he was not thinking of the job at hand; he was thinking of the day he would be coming home in one of those beautiful planes. As he stepped from the ladder to the hay stored in the barn, Jim's foot slipped and he fell to the ground. When he tried to move, a terrific pain struck him in his back. He couldn't move his legs.

For weeks Jim lay in the hospital in a cast. The doctor did not tell Jim that he would never walk again, but Jim knew it would be difficult. There was still no feeling in his legs. But that didn't depress Jim. His determination to fly would not let this injury lick him. He didn't know how, but he felt that he would recover.

Six years later when Jim enlisted as an aviation cadet, he still had occasional pains in his back, but there were no outside marks to give him away. When the flight surgeon said, "Any major injuries?" Jim quickly replied, "None, sir." He was determined to conceal his one weak spot. He knew the flight surgeon would never let him fly if he x-rayed his back. Jim had to have those wings.

When he reached Ontario, California, for his primary training, Jim was sent to March Field for another physical check. That made him nervous. Had they become suspicious? How could they have detected that anything was wrong? Again his answer to the flight surgeon was, "None, sir."

Primary and basic were quickly behind Jim.

Only an occasional pain bothered him now. He would make it. Advanced training shouldn't bother him any more than basic flying had. But Jim was wrong. The longer missions flown in advanced school made his back hurt more. Sometimes the pain was almost more than he could stand. Several times he thought of going to the flight surgeon and revealing his true condition. Then he would think of the days he had dreamed of the opportunity he was now enjoying. His AT-6 was far more complicated than the old biplane he had seen Lt. McCauley fly. He couldn't give up now. Only a few more hours to go.

When Jim was called in for his final physical before being discharged to accept his reserve commission, he was scared. He felt that he would be discovered. Again he replied, "None, sir."

After that wonderful moment when James L. Baker was called to the stand to receive his wings, he was sent to Payne Field to fly P-39's. All through flying school Jim had asked for A-20's or B-17's, "and they had to give me fighters," he murmured to himself.

After 60 hours in fighters, he was sent overseas as a trained fighter pilot. Jim had grown to love fighters. He knew he would make good.

His first mission was nearly four hours long. A pilot of a P-40 could get pretty tired in a flight of that length. Jim was so excited he didn't even notice the pain in his back.

After 62 missions, Jim was returned to the States. He wasn't proud of the record he had made as a combat fighter pilot, and he had thought many times that he would give himself up to the flight surgeon. He knew that the other pilots would have said he was yellow if he had. He wasn't, and no one had the opportunity to say that about him. He would have died in the cockpit of his plane before he would have quit.

About the time Jim returned to the States, there was much talk about a wonderful new plane called the P-80. The more he heard about it the more he was determined to fly it. After he had flown it he planned to turn himself in to the flight surgeon. The pains were occurring more frequently and were much more severe.

One flight in the P-80 was not enough for Jim. He wanted more. Up to Washington he went and returned with orders to proceed to March Field. His duty—P-80 pilot.

The California sky was filled with smog to 15,000 feet so Jim climbed to 20,000 before starting to practice his acrobatics. "Got to be in good shape for the airshow at Long Beach tomorrow," he thought. After 20 minutes of twisting and turning at the airspeeds common to the P-80, Jim could no longer stand the pain in his back. Even after he had landed it was severe. He told the squadron commander he didn't feel well and went to his sack.

The night was long and sleepless for Jim. The pain in his back was terriffic. He started to call the flight surgeon, then thought of his mother waiting at the air show to see her son fly that beautiful P-80. She was proud of Jim. No! He would wait until after tomorrow's show and then have something done for his back.

As the hours dragged by, Jim wondered how many pilots in the Air Force were in a condition similar to his. He felt there must be others. He considered himself a liability to the Air Force and a hazard to other pilots. He wondered how the other fellows in the squadron would feel when his true condition was known. He wondered how many valuable men and airplanes would be lost by other pilots like him who had concealed their injuries from the flight surgeon.

When he reported to the squadron next morning, his squadron commander asked, "Feel like flying your mission today, Capt. Baker?"

"Yes, sir," he replied as he yawned to conceal a new pain in his back.

"O.K., you and Simmons be over Long Beach at 1400 hours. You don't have to fly unless you feel all right. Sure you feel O.K.?"

"I'm feeling fine this morning, colonel. I'd like to fly this show today, then I think I'll take leave and rest up for a while," was his reply.

"What a beautiful airplane," Jim said to Lt. Simmons as they walked toward the P-80's in front of operations.

"Sure is, captain," Simmons answered, "Makes me excited just to look at it."

Jim led the flight over Long Beach, then headed for the municipal field. He and Simmons buzzed the runway at 100 feet, then pulled up into a steep climb, rolling in trail formation. Jim's plane wobbled crazily then started spiraling toward the earth.

"What's the matter, Captain Baker?" Lt. Simmons called over "B" channel.

The plane kept plunging toward earth gaining speed all the while.

"Get out, captain, get out!"

All that Simmons ever heard was, "My back, it's kill. . . . . ."

LUCKY BOY NO Fire

A PILOT'S ATTITUDE in attempting to avoid major damage to an airplane is always admirable. But it should not take the place of safe procedure. Here is a case where a good measure of luck kept a pilot alive after he had ignored basic forced-landing techniques in what he thought was an effort to minimize damage to his airplane.

An hour and a half after takeoff on a P-51 ferry flight, the engine began to run rough. It did not improve with higher power settings. Then it began to lose power. The pilot's map showed a civilian airport near his position. He circled back attempting to locate it, with the plane losing power each minute.

No airport was visible. A sod field without runways is not easy to spot in an emergency. He couldn't afford to lose any more time because precious altitude was going fast. There was a paved highway in line ahead. No good, he decided. Too much traffic. But just then he located a dirt road which was free from obstructions and decided to land wheels-down with the possible hope of saving the airplane.

With his remaining power and altitude he made a quick check of the road, saw it was clear and turned on final approach. As he rounded out and lined up, the engine failed completely. He cut off the switches and fuel. He attempted to roll back the canopy, but it seemed to jam and he had no time to clear it. By this time he was touching, wheels and flaps down. Rolling along the dirt road, the plane veered to the right. A wheel hit a soft spot, a 20-mph crosswind gave an extra boost, and the Mustang was on its back in the ditch.

Residents nearby heard the plane's engine missing and saw it flying very low. Then they heard the engine quit and saw dust as the plane hit the road. They ran to the scene, found the plane on its back. Gasoline was dripping into the sand from the filler covers on both wings. Underneath, they could see the canopy section filling a narrow ditch. The pilot was inside and alive, but unable to escape. The people arriving at the scene dug him out.

Fortunately for the pilot, the plane did not catch fire. Also, as luck was with him, the canopy rested in the ditch which probably saved him from crushing injuries.

The airplane was wrecked. Had a wheels up landing been made, the airplane might have been economically repaired. It all goes back to the primary rule: Never land an airplane (except those with fixed-gear) wheels-down unless a suitable airfield or strip is available and can be utilized with assurance of a safe landing. If this procedure cannot be followed, the plane should be abandoned at a safe altitude.

THE TRUTH WILL OUT

THERE IS AN OLD saying among detectives that a criminal will return to the scene of his crime. Here is a case where a pilot returned to the scene of a previous violation and was tripped up by accident sleuths.

A contract pilot, assigned the job of testing a Norseman UC-64, had been flying about 30 minutes when he told his crew chief that the aileron control was stiff. The crew chief suggested returning to the base to check the cause of the trouble. But the pilot told the crew chief he thought they should make an immediate forced landing.

He circled a farm half a dozen times and landed in an adjacent field. While taxiing to a stop, the plane struck a soft spot and nosed over.

The farmer, on whose land the accident happened, drove the pilot back to the air base where he reported the accident. This was considered by the pilot and the farmer to be the quickest way to notify operations.

Prior to takeoff, the pilot told accident investigators, aileron control was noticed to be stiff. Snug fittings, he thought. After 30 minutes flight the control was still stiff, the pilot said.

The plane had been flown directly to the farm. In spite of aileron trouble it circled the farm seven times. These facts, as well as the friendly ride back to the air base, might not have made a case for the investigators. After all, it is up to the pilot to make the best decision to save lives and property. And this pilot claimed the faulty airplane was the reason for his decision.

The important facts were not told by the pilot, but were discovered later.

These were that he knew the people who owned the field in which he landed. He had also landed an Air Force plane in the same field six weeks before, at which time the land was frozen and no trouble encountered.

It didn't take the board long to decide that the landing which resulted in the accident was premeditated and not exclusively the result of aileron trouble as the pilot stated.

If the pilots involved in accidents do not give complete and true statements as to what happened, and all the circumstances surrounding the accident, investigators may be led up a blind alley. They will be sidetracked in their efforts to take corrective action to prevent similar accidents.

This man might have caused costly inquiries into the subject of aileron controls, but for the turning up of the facts about his connections with the residents at the farm. The seriousness of his failure to give a full report was evident in the board's action. He was dismissed from further flying service for the USAF.

ONCE IS ENOUGH!

(EDITOR'S NOTE: These are experiences of pilots who knew better but had to undergo a bit of a shake-up to have the safety lesson sink in. The authors of the following stories remain anonymous at their own requests. If you have had a "Once Is Enough" experience, share it with other airmen by sending it direct to the editor, FLYING SAFETY, Field Office of The Air Inspector, Langley Air Force Base, Hampton, Virginia. We will withhold your name on request.)

Check and Double Check

AS FAR AS I CAN FIGURE the deal out, I'M DEAD! You just don't mess up as badly as I did and live to tell it. So consider this a ghost story. It was one of those days in England you read about, the visibility was about 50 feet, and sitting in a B-24 cockpit that adds up to exactly zero. Anyhow, the mission had to go, the target was clear and the troops over around the Ardennes needed some aerial assistance, but bad.

So with a jeep leading us and a man with a flare under each wing we were lined up with the runway —we thought! The C.O. hopped on board for a few seconds to bolster our confidence and then departed with a word of warning about checking everything. The directional gyro was caged and uncaged, all engine instruments checked, and with a cocky "Hi-Ho Silver," I poured on the coal.

With eyes glued on that gyro, I made sure it didn't move a degree. Yes sir, that big Liberator was making a bee-line—RIGHT OFF THE RUNWAY! We started mowing down sodium flare markers like a picket fence. The command pilot could see we were headed off to the right at gun emplacements, parked airplanes and engineering huts.

The CP hollered, "PULL 'ER UP!" So, with a full load of bombs and gasoline, I pulled her up! I.A.S. 90 mph. Of course, she stalled, luckily to the left, and we bounced on the runway. It was too late for breaking the momentum, so the only alternative was to hit emergency power on everything including the electronic super-charger. She got off the ground again in a half stall to the left. We broke out of the soup at about 350 feet. Later, we were told that we had flown between two parked aircraft, two maintenance hangars, and between a tree and a farm house. Our course had been about 350 degrees of a circle within the field boundaries.

After breaking out, we took inventory and found we had a badly bent B-24. So we aborted and spent the next few hours using up gas looking for a place to land. A break in the clouds finally showed a RAF field under us, so we landed. When we pulled up in front of the tower the right tire blew out — 36-inch gash in the tread. The bombs were still with us. Now what started this miracle chain of events? One over-confident pilot who forgot to check his directional gyro setting against the magnetic compass. Check and double check!—CAPTAIN PHILIP (GHOST) RIBLET, JR.

Haste Causes Fright

We had been having trouble with our radios before we landed at Tulsa. But we were in a hurry to take off again. So when Flight Service advised us that there were ceilings near the VFR minimums between Tulsa and Memphis, we phoned in our plan anyway.

Being a couple of eager beavers we strewed maps all over the B-25 cockpit after takeoff and started to navigate by pilotage. The radio compass seemed okay again and the needle was pointing straight ahead to Little Rock.

As we approached Little Rock the clouds began to skid underneath us. On checking the terrain features along our route we deemed it wise to stay on top and called Little Rock radio for a change of flight plan. They informed us that ATC would clear us IFR, 500 feet on top.

We gathered our maps together and gave them to the engineer to file and began to use our radio compass to navigate. Memphis range was picked up and we began homing on it.

About 30 minutes from Memphis the radio compass quit navigating for us. Being a couple of versatile characters we tuned in Memphis range on the command set and began to bracket a leg of the beam. This worked successfully, but just as the signals began to build up rapidly, the command set went out too. This left us with VHF only on top of the overcast at dusk.

Memphis Approach Control was contacted on VHF and we advised them of our sad situation. "Here I am, flat on top of the overcast — near Memphis. What do I do now?"

They advised us to circle! We, of course, questioned such advice immediately. They informed us that this was necessary only until they cleared traffic within a hundred-mile radius of Memphis.

In the meantime I could just visualize Rex Riley saying, "A captain and a 1st Lt. took off in a B-25 —"

But through the medium of all this chit-chat with Memphis Approach Control we learned that we could stay near Memphis by checking the volume of our VHF. When the volume was weak, Memphis advised us to do a 180 back towards the city. This developed into a regular pattern and we even took into account the wind drift at 6,000 feet.

One hour later Memphis advised us that we could start to let down in a few minutes — they had a 1,500-foot ceiling. We had been cruising at maximum endurance power settings and knew that the odds were against our staying up there forever. Suddenly we noted a glow on the horizon — it was the lights of Memphis shining through the overcast. This was a welcome relief as we were now reasonably sure of our exact location.

Permission to let down was received and we began nosing down into the overcast, timing it so we broke out of the clouds near the outskirts of the city. We landed at Memphis for repair of both pilots and radio equipment.—Lt. R. L.

Sleep No More

It was fly, fly, fly night and day for an instructor giving first phase to pilots just out of flying school. At the time I learned "once is enough" I was instructing in B-24's at Geiger in the summer of 1942. Every squadron was in the race to see which could keep its Liberators in the air the most hours out of each 24.

We would take two new pilots up for four to six hours of familiarization flight, then land and take a brief rest and report for another six-hour hop with a different duo. I had flown a high-altitude practice mission that morning, and it had been hot in the afternoon so that I couldn't sleep. That evening two spanking new lieutenants reported to me for their first ride in the B-24. They were eager, their eyes wide in amazement as I showed them through the big bomber.

I took the plane off with one of the student officers in the copilot seat, after a complete cockpit briefing. I found they had been reading the B-24 manuals all afternoon in anticipation of the flight. "This is a break," I thought. "These kids are going to get a quick check-out."

As we climbed up to about 11,000 the cool air freshened me. We started a trip "around the horn" — to Euphrata, to Walla Walla, and back to Geiger, a round-robin so familiar to me by then that it was boring.

By the time each of the two students had had a go at the controls, boredom had been replaced by drowsiness. I fought to keep awake. My eyes

smarted. The instruments blurred under the fluorescent lights. Then I did what has haunted me ever since. I turned the plane over to the two lieutenants and sat down on the floor behind them.

When I awoke, cramped and cold, it was still dark. The two pilots were seated in the same position as before I went to sleep. I looked at my watch. We should be past Walla Walla en route back to Geiger.

I leaned over the aisle between my students and asked, "Where are we?"

One of them planted his finger on a map and indicated a general area near Walla Walla. I motioned the student out of the pilot's seat. Glancing at the compass as I buckled the safety belt, I noticed we were heading in a Westerly direction still at 11,000 feet. I looked out the window to see if I could identify our position by city or airway lights.

I saw no lights through the side window, but did see a shape that stopped my breath — a mountain! I grabbed the controls and did a quick right turn. The peak I had seen towered above our altitude, and the plane's left wing seemed almost to be touching it when I first saw it.

After the turn we spotted the lights of Yakima. We had almost ploughed into Mt. Adams!—Maj. F. R. A.

FATEFUL INTERLUDE

A STORY BY
LT. COL. CHESTER H. MORGAN

SUSAN SAT on the edge of the bed yawning and stretching her body into wakefulness with the luxurious abandon of youth. Then with a sudden burst of energy, bounded across the room, threw open the curtains, blinked at the flood of sunlight, swept her gaze upward and after a moment focused her eyes on some thin curved lines which formed silver patterns against the blue sky. Vapor trails. She wondered if Bob was up there and with the thought came a warm glow and a radiant awareness that she was in love and tonight she would become Bob's wife. From sheer exuberance she began humming a happy tune for life was good and the future was full of promise.

☆

ROBERT L. HOTCHKISS, III, 2nd Lt., USAF, frowned, shook his head violently, rubbed his hand over his eyes and wiped the sweat from his brow. The captain sure was giving them a workout this morning of all mornings. Bob knew he wasn't doing so hot for the captain's voice had made that quite clear in terms that had rattled through his headset and scorched his ears.

Somehow Bob wasn't as smooth on the controls as usual. He wished the bachelor's party the boys had given him last night had broken up sooner. But it was his last fling and three o'clock had arrived before he realized it. Susan's face, with its frame of curly blond hair, dancing blue eyes, and provocative lips drifted into his thoughts. . . .

A sudden blast in his earphones ended Bob's reverie — "Are you trying to kill me or do you want to lead this formation?" Bob hastily retarded his throttle to get back into position. Too much, he realized tardily, and grimly jammed the throttle forward. Nothing happened. Frantically, he jerked his eyes to the tail pipe temperature gage. Holy cow, a flame-out! Panic seized him, then training took effect and he began going through his airstart procedure. No luck. Try again. More hurried this time, because the earth was rushing up to claim him like a prodigal mother. One more quick try and then over the side. He brought the nose up to slow the P-80 down, reached for the canopy release, and jerked. A fraction of a second later he remembered and started to duck his head — then blackout. As his body slumped forward, a thin trickle of blood ran from his nose and around his mouth. Unheard were

the screams in his headset . . . "Bail out, Hotchkiss, for God's sake, bail out!"

☆

A TALL, SERIOUS COLONEL, greying at the temples, was standing in front of a raised dais and speaking earnestly. The Arbiter looked down sympathetically.

"In conclusion, Sir, as Colonel Simmons' alter-ego I respectfully request that action be taken with the least practicable delay. Otherwise his son will not be able to finish college and since Mrs. Simmons is not well, their daughter will be forced to forego her own future to stay home and take care of her mother. Certainly YOU will agree that this family has contributed a great deal more than their share to the advancement of the happiness of their fellow men. It is my firm conviction that unless immediate and positive action is taken undeserved hardship will result and the cause of justice will suffer."

The Arbiter stroked his chin and gazed thoughtfully at the high-vaulted ceiling. "Colonel," he said, "you plead your case ably, but I wish to remind you that you are asking for an exception to OUR rules. Colonel Simmons is a command pilot and has over 5,000 hours; therefore, he should know that if he is to fly safely he must maintain his proficiency. I realize he has had a desk job which has made it difficult for him to get away, but I consider that an insufficient reason for him to permit his proficiency to fall so low that he couldn't pass an instrument check if he had to.

"Command pilots have a dual responsibility in that they not only must maintain their own proficiency, but they must set an example for younger pilots. Colonel Simmons has neglected this responsibility. Furthermore, he has flown new-type aircraft with which he was unfamiliar; yet his pride in himself as a pilot prevented him from demanding a thorough check-out. Right now he wouldn't need MY help if he had been able to perform a good instrument letdown, but instead he tried to sneak in contact as he used to do in the P-12. I remember when he had less experience I used to help him quite often, but now he should be able to look after himself. Sorry, Colonel, but WE will take no action — Next!"

A major wearing a senior pilot's wings came forward briskly, saluted smartly, and began talking with a note of urgency in his voice:

"It's about my alter-ego, Sir, Major Snowden who was on TDY in California when his wife telephoned him that their little girl was sick. He immediately started for his home base in Ohio. The operations officer advised the southern route because of icing, but he wanted to get there as soon as possible and cleared to Denver. He signed as his own clearing authority and would have made it, but icing was more severe than forecast and he's in serious trouble over the mountains west of Denver. It would be deeply appreciated if YOU would do something to help him."

"My boy, with authority goes responsibility and Major Snowden has misused the authority granted him. He has had sufficient experience to comprehend the difficulties which lie in the path of the hasty, unwary pilot. Sorry, no action."

"But, Sir, what will become of his wife and two small children? They haven't saved much money and his insurance won't last long. How are they going to get along?"

"Major Snowden should have thought of those things before he signed his clearance. He should have realized that it would be better to arrive a little late than —" He didn't complete the sentence because the door to the chamber burst open and a second lieutenant rushed up breathlessly, started to speak, remembered himself, saluted, and began speaking hurriedly.

"Excuse me, Sir, but something's got to be done fast. My alter-ego, Lt. Hotchkiss, is in an awful jam and unless YOU bring him to so he can bail out he's going to be killed. Please, Sir, won't you send someone real quick?"

The Arbiter sat up straight.

"Didn't he just graduate from flying school?"

"Yes, Sir, just three months ago."

"How many hours does he have?"

"Only 250 total, Sir."

"Have WE helped him out before?"

"No sir. Please, Sir, help him before it's too late. He's supposed to be married tonight!"

"Gabriel!"

"Yes Sir?"

"Send someone to help Lt. Hotchkiss right away. Send someone who can fly fast because he's in a P-80."

"Right away, Sir."

Lt. Hotchkiss' alter-ego beamed joyfully, "Thank you, Sir, Lt. Hotchkiss will be a better pilot, I know. He's learned something today."

"I hope so, son." Then the Arbiter continued thoughtfully as though talking to himself: "Got to start a training program right away to get our angels to fly faster than these new planes they're building."

☆

THE STRAINS of Lohengrin filled the Church, and Bob, with a patch on his head, smiled happily as Susan came slowly down the aisle. Yes, for them life was good and the future full of promise.

LETTERS TO THE EDITOR

Dear Editor:

I have read from cover to cover the January and March issues of FLYING SAFETY and wish to send my personal congratulations to you and your staff.

To my mind, FLYING SAFETY represents a tremendous and appropriate stride in the Air Force's plan to bring to the attention of our pilots, in an interesting yet forcible manner, the ever-present need for observance of our accepted rules and regulations governing safe flying operations.

In my opinion, your magazine should be required reading for every rated officer in the Air Force, and its distribution not limited, as at present, to one copy for each five persons directly connected with flying. . . .

One of my Aides has standing orders to bring your publication to my personal attention immediately upon its receipt each month.

The interesting content, the manner of presentation and the general planning which is evident in FLYING SAFETY are indicative of a very capable and hardworking staff. My whole-hearted best wishes to all concerned. . . .

GEORGE E. STRATEMEYER
Lt. General, USAF
Commanding, ADC

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Dear Sir:

Your magazine is one of the outstanding publications on Flying Safety and the valuable information gained from it and "AF Aircraft Accident Review," if utilized fully by all Air Force Personnel from commanding general to private, will reduce aircraft accidents and produce more proficient pilots and crew members in the United States Air Force.

However, if the undersigned may be allowed one criticism of the Flying Safety Program, the tremendous potential value of the published material is seriously minimized by the lack of emphasis many commanders, including base, group and squadrons place on it. In the last two years, the undersigned has observed that it is a rare occurrence when a base or group commander actually attends his own flying safety meetings. This definitely causes young pilots to put less emphasis and less attention on the flying safety program which, in turn, results in less attention to their flying proficiency.

It is true that all commanding officers are very busy persons and must put "number one" projects first and leave those of less importance to their subordinates. However, if they put a high priority on flying safety and attend scheduled meetings for two or more hours each month, their presence would emphatically direct the attention of pilots and crew members of their organization toward Flying Safety.

ELMON R. COBB
Major, USAF

(*We agree C.O.'s should sample their own pie.*—ED.)

★

Dear Sir:

During February, I landed at Air Force Westover Field, Mass. and while filing a flight plan, was given a copy of FLYING SAFETY for December 1947. I found it to be a very informative, instructive, and valuable publication.

As Operations Officer of the squadron, I know it would be of considerable value in the squadron safety program.

R. D. NYE, LCDR USN
Naval Air Station,
Quonset Point, R. I.

(*Welcome, Commander. We hope others will copy Westover in keeping the magazine circulating.*—ED.)

SAFETY QUIZ

1. Holding consists essentially of
   a. maintaining constant airspeed and power settings.
   b. maintaining a fixed heading to stay "on course."
   c. maintaining a fixed rate of turn.
   d. flying between fixed limits on a leg of the range at a definite altitude.

2. A certain radio beam has two fan markers: one on the NE leg, and one on the SW leg. The marker on the NE leg transmits a signal of
   a. 1 dash.
   b. 2 dashes.
   c. 3 dashes.
   d. 4 dashes.

3. The formula for computing approximate time out from a radio station using the radio compass is
   a. $\frac{60 \times \text{min. flown between bearings}}{\text{degrees of bearing change}}$
   b. $\frac{\text{true airspeed} \times \text{minutes flown}}{\text{degrees of bearing change}}$
   c. $\frac{\text{true airspeed} \times 60}{\text{degrees of bearing change}}$
   d. rate × time equals distance.

4. Variation is the difference between
   a. true heading and compass heading.
   b. magnetic heading and compass heading.
   c. magnetic north and compass north.
   d. true north and magnetic north.

5. A "wing-tip null" exists
   a. only when homing on a station.
   b. when the station is off to 90° and the needle is at zero.
   c. when the station is off to 90° and the needle is at 180°.
   d. when passing the station with the needle at 90° or 270°.

6. The width of the "null" when using the LOOP position may be varied by
   a. changing frequency.
   b. varying angle of bank.
   c. switching to COMP.
   d. changing volume.

7. A pilot is flying at a true airspeed of 180 mph at a right angle to the inbound bearing to the station. If his null heading changes 5° in 5 minutes, the time to the station is
   a. 30 minutes.
   b. 45 minutes.
   c. 60 minutes.
   d. 80 minutes.

8. A pilot is west of a station and is flying a 315° heading. The relative bearing to the station as read on the radio compass needle is
   a. 90°
   b. 135°
   c. 270°
   d. 360°

9. In solving the "180° ambiguity" of the aural null, if the relative bearing has increased, the radio station is
   a. directly behind.
   b. directly ahead.
   c. to the right.
   d. to the left.

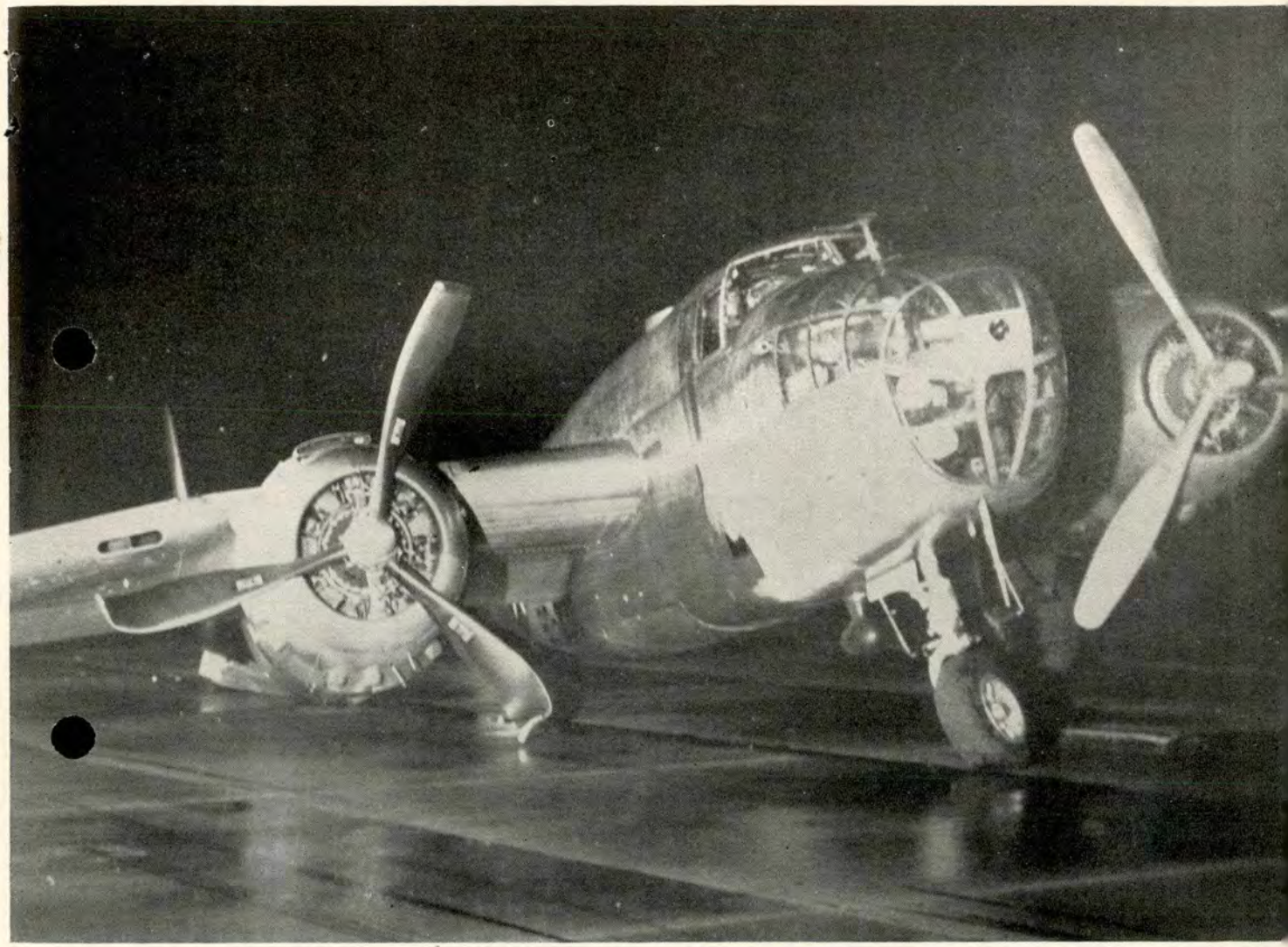
10. A pilot tracking inbound, drifts off 10° to the left and makes a 30° correction. He will intercept the track when the compass needle indicates
    a. 10°
    b. 30°
    c. 330°
    d. 350°

★

ANSWERS

1—d; 2—a; 3—a; 4—a; 5—d; 6—d; 7—c; 8—b; 9—c; 10—c

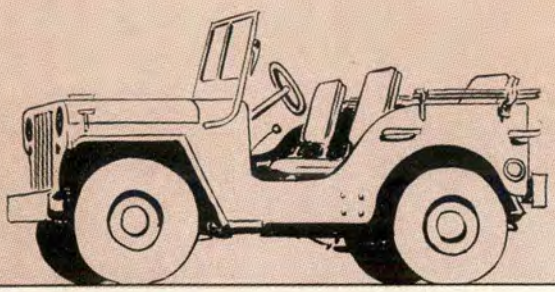
WHY?

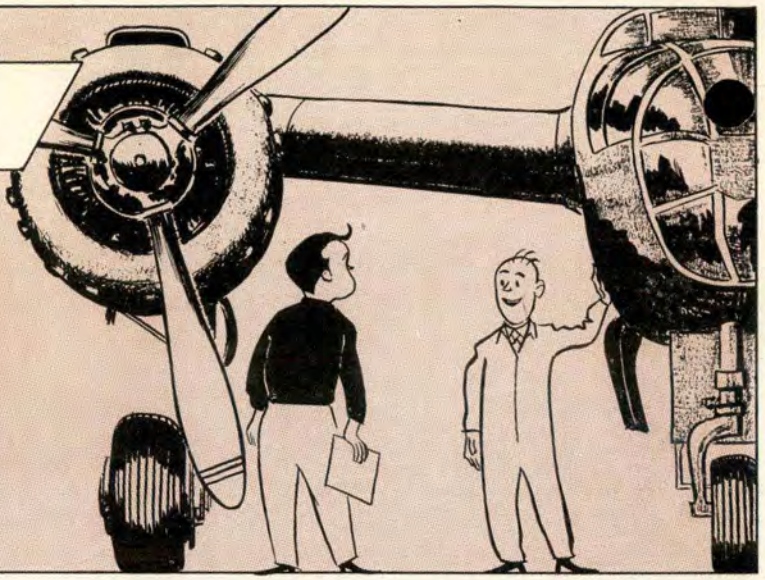


RETURNING ON TOP to his home base after an instrument instruction flight, a student pilot made a normal range letdown. After crossing over the high cone, the approach was turned over to GCA. The instructor pilot took over on the final approach because the student was flying above the glide path and was making no effort to increase his rate of descent to get back on the glide path. The gear was lowered by the student pilot. Breaking contact, the instructor turned the controls over to the student. A normal landing was made. As the B-25 slowed down to taxiing speed, the instructor reached down and opened the cowl flaps. The student reached down for the wing flap handle and noticed that the wire safety catch was not in position over the gear handle. He promptly raised the gear handle so that the safety wire could be placed in the proper position. As the right gear folded, he returned the handle to the down position. The airplane received major damage.

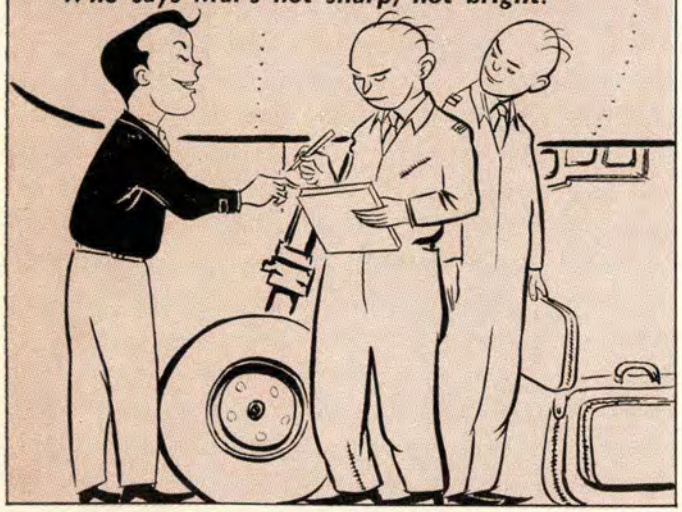
Mal Function

AO Mal shows boys in plane
Parking place in farthest lane.

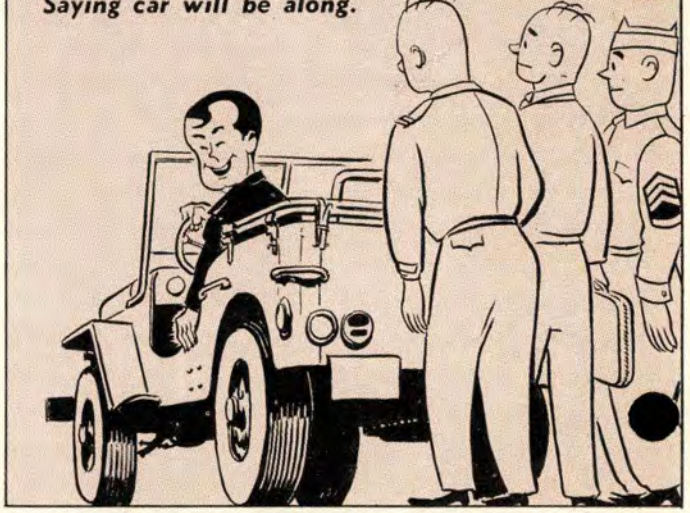




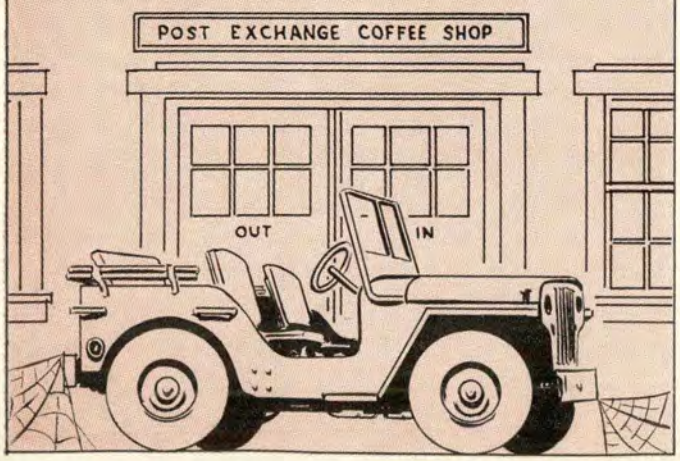
Just these forms will make things right,
Who says Mal's not sharp, not bright?



Duty done old Mal is gone,
Saying car will be along.



Mal has minor change in plan
Must look after inner man.



Much, much later—hot and mad,
Three poor guys know they've been had.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1948—751954/3258