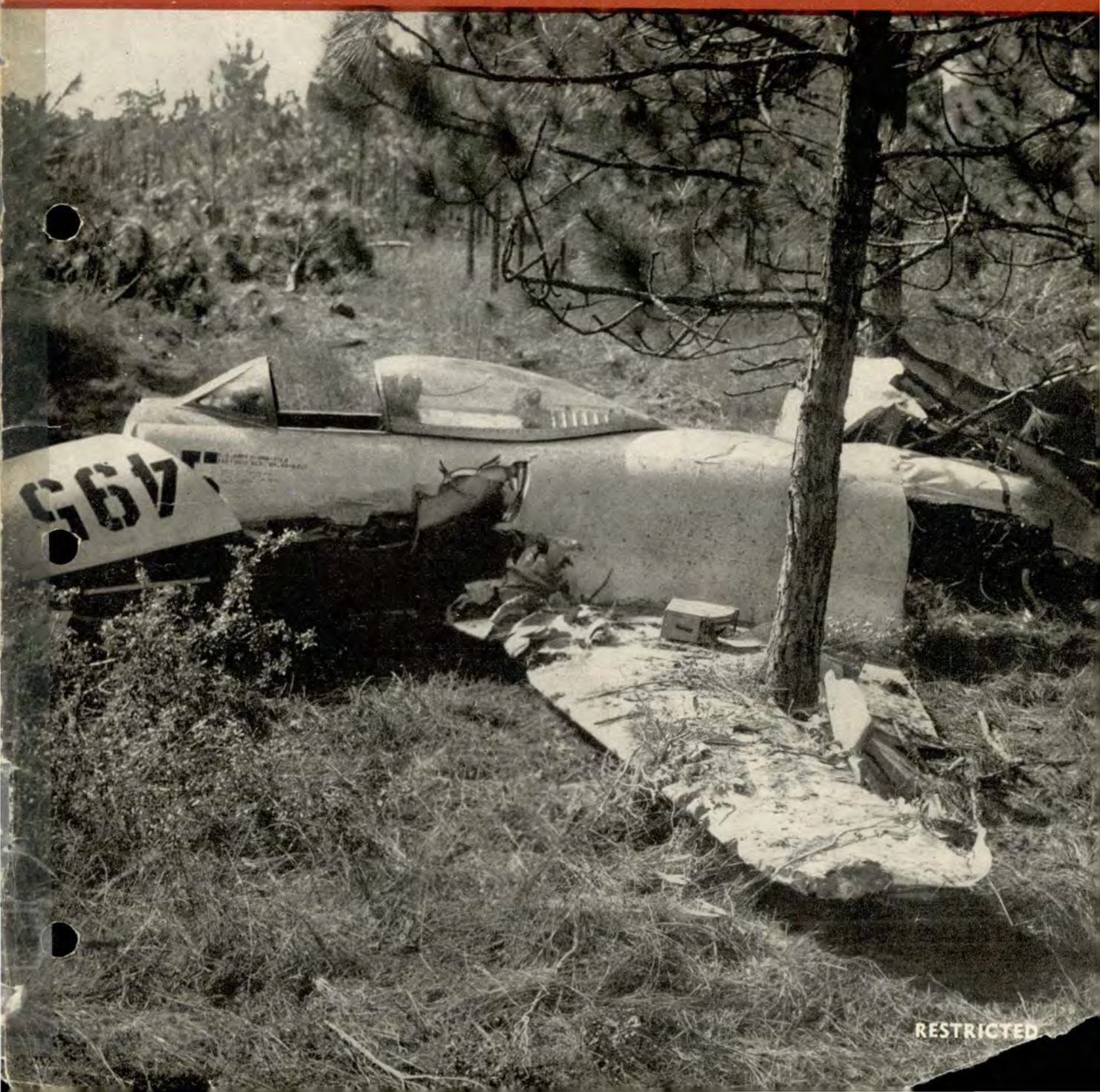
Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED

JANUARY 1948



RESTRICTED

THE COVER STORY

What would you do if your power failed at low altitude in a traffic pattern with heavy traffic preventing you from reaching a clear runway?

While flying at 1,000 feet and 385 mph, the pilot of the P-80 on the cover heard an explosion and power failed completely just as he prepared to enter the traffic pattern. There was little time left for action. With other planes in the pattern and on the runways, and consequently numerous radio calls, there was not enough time for the tower to clear the runway in use for an emergency landing. Unable to glide to a runway that was clear, the pilot had no alternative but an immediate crash landing. He turned slightly to hit a spot where the trees appeared thinnest. The jet airplane slashed into the pines at 130 mph, cutting a wide swath before it crashed into the ground. Miraculously, the pilot was uninjured, but a bull and two cows grazing in the woods were killed.

★

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 to the address at the bottom of this page.

FLYING SAFETY

Volume 4 No. 1 January 1948

EDITOR ..... CAPT. H. P. ANDERSEN
ASSOCIATE EDITOR ..... 1ST LT. HAL J. BASHAM
ART EDITOR ..... CAPT. WILLIAM M. METTLER
ASSOCIATE ART EDITOR ..... CAPT. JOHN J. HERBERT

CONTENTS

ACCIDENT 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.

Facts, testimony and conclusions of aircraft accidents printed herein have been extracted from USAF Forms 14, and may not be construed as incriminating under the 70th Article of War. All names used in accident stories are fictitious.

This document contains information affecting the national defense within the meaning of the Espionage Act, 50 U.S.C., 31 and 32, as amended. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

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

SAFETY'S FIRST READER

THROUGHOUT THE WAR the principal challenge to U. S. air power was not enemy action but accidents. During the first 32 months of battle, for example, a total of more than 11,000 USAF aircraft were lost in non-combat wrecks in the U. S. alone, compared to 7,700 lost on combat missions or attributed to enemy action.

The same challenge exists today because accidents threaten our future air power. The crashes reported in this and every issue of FLYING SAFETY magazine have a direct bearing on how well America and its ideals can be defended, they determine how many first-line planes we will have for an emergency and they even determine the production plans of our entire aircraft industry.

Here is why:

The future strength of the United States in the air will depend not merely upon its Air Force but upon the foundation upon which air power rests: the magnitude of commercial and private aircraft operations, the size of the aircraft industry, and the technological advancement which will be fostered by large scale growth. Public acceptance of aviation as a principal part of the American transport system will to a major extent provide a basis for national security. The public will not accept a dangerous thing by using it on a large scale. An unhealthy aviation industry and a weak transportation system do not back up air power.

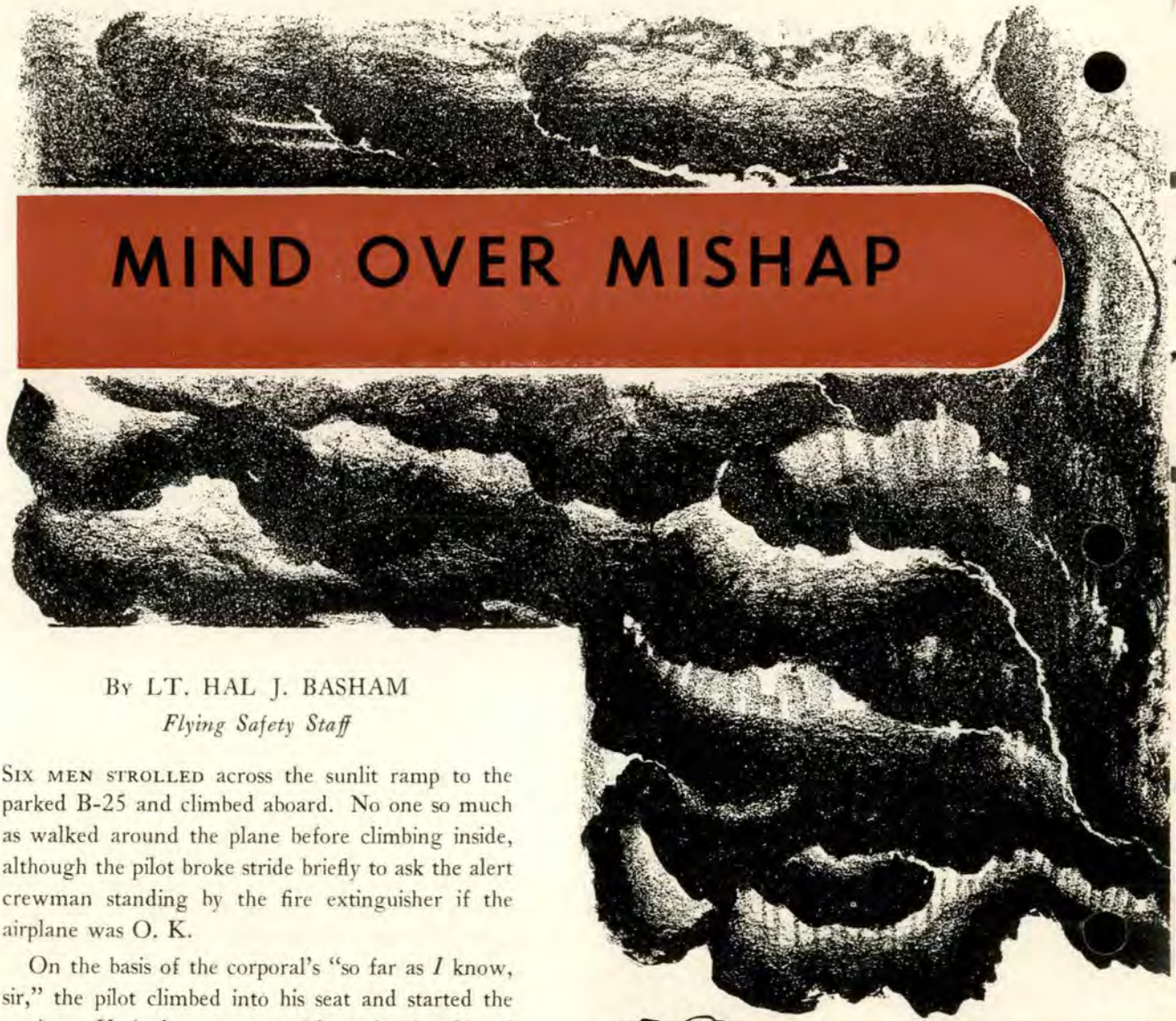
We cannot escape the conclusion that military aircraft accidents stunt the future growth of civil aviation. Likewise, we are faced with the facts that all air accidents hamper our military potential because they thwart the growth of the industry.

This publication has access to the greatest single source of aircraft accident information. It is the data to be found in the tens of thousands of accident reports available in USAF Headquarters. To use this information as a basis of furthering safety standards in peacetime aviation is a possible compensation for the tremendous wartime losses such information represents.

Public support for air power will be contingent upon the realization of high standards of air safety. The economy and reliability which the public wants in all forms of air transportation, military and civil, can only be achieved by safety.

And maximum safety can be attained only by employing to the highest degree the knowledge gained from past experience and the results of research and study. Thus, this magazine seeks to present the experience and know-how of the Air Force in an effort to engender flying safety among the members of the largest and most successful operators of aircraft in the world.

MIND OVER MISHAP



By LT. HAL J. BASHAM
Flying Safety Staff

SIX MEN STROLLED across the sunlit ramp to the parked B-25 and climbed aboard. No one so much as walked around the plane before climbing inside, although the pilot broke stride briefly to ask the alert crewman standing by the fire extinguisher if the airplane was O. K.

On the basis of the corporal's "so far as *I* know, sir," the pilot climbed into his seat and started the engines. He had supreme confidence in himself and the airplane. He had flown more than 2,000 hours in B-25's.

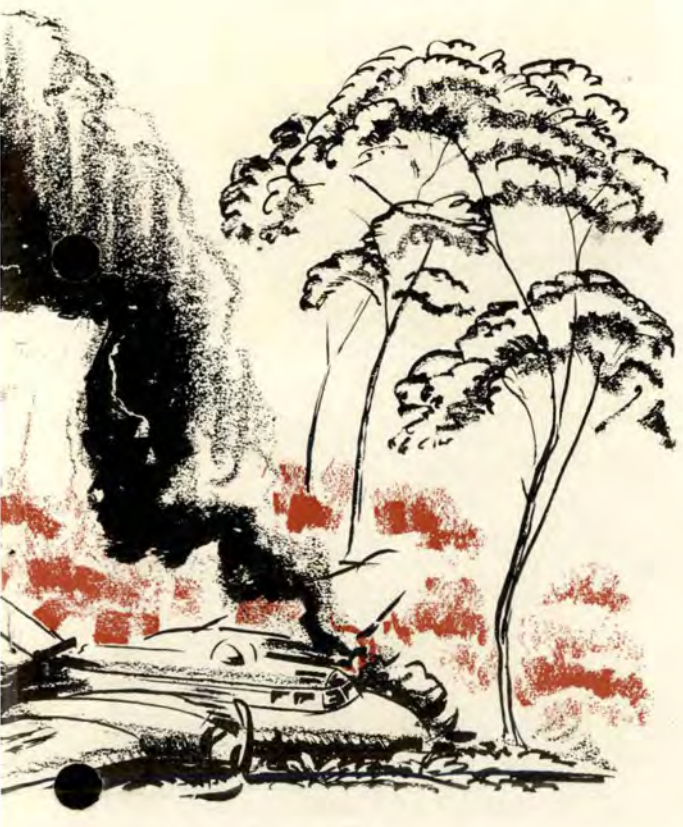
Ten minutes later the plane was a blazing funeral pyre for the over-confident pilot and his five passengers. Only minutes after takeoff at approximately 2,000 feet fire had broken out in the right engine. A farmer and his hired hand had seen the plane pass overhead with the right engine feathered and the right wing in flames just a minute before the crash.

Evidence indicated none of the crew had donned parachutes upon entering the plane because there

was sufficient time between outbreak of the fire and the crash for everyone to have bailed out if they had been wearing chutes when the emergency occurred. The corporal on the fire extinguisher had been an alert crewman and was not even a mechanic.

The pattern of this particular accident is growing all too familiar to personnel in Flying Safety. The pattern is the more deadly because it denotes an increase in the attitude of complacency and blind confidence held by many pilots. *This insane attitude is based solely upon the fact that recent past flights were uneventful and successful.* Pilots who entertain this insidious frame of mind are not asking for the ax, they are demanding it.

This unfounded complacency is not to be confused with the confidence that comes from the knowledge that the plane and its equipment have been personally checked and that everyone aboard is properly briefed and prepared for any emergency. This confidence is the natural, healthy result of sound practices. The dangerous confidence is that based on the figment that past success denotes future security.



The attitude takes many fatal forms. There is the "old-standby" fallacy, the "anybody-can-fly-these-things" or the "it's only a trainer" frequently applied to the C-45 and AT-6, and the granddaddy of them all "hell I got 500 hours in this kite," applied to any airplane. When a man begins to feel complacent, begins to take an airplane for granted, he is carrying disaster around in his breast pocket.

For the first nine months of 1947, 32.36 percent, one third of ALL Air Force accidents in the United States were AT-6 accidents. In September, the last month for which total figures are available, this percentage increased to 39 per cent of ALL continental accidents.

Nearly all of these accidents occurred with experienced pilots at the controls, pilots whose principal duty was not flying the AT-6, the airplane *anyone* can fly. Had this unhealthy "anyone can fly it" frame of mind been less prevalent, this ignominious record might well not have been.

A colonel command pilot wanted to take his young son up for a ride. The only airplane available was a C-45. The colonel was not current in the C-45 and did not know the emergency procedures, but what the heck, it was only a trainer; anybody could fly it. The colonel and his son climbed in and took off. He failed to use the checklist properly because he forgot to turn on the generators.

After several hours' flight, his radio and other electrical equipment failed. Naturally the gear would not extend normally. The pilot depressed the emergency clutch and attempted to crank down the gear, but, unfamiliar with the emergency procedures, he did not know that he should hold the clutch in while cranking the gear down. He was unable to extend it. The plane received major damage in the resulting belly landing. The colonel was a victim of his attitude that anyone could fly the C-45 without knowing its operation procedures. Other pilots are ensnared by other variations of false confidence.

The devil must love the C-47. It's this airplane,

the workhorse of the Air Force, the safest plane in the world, the "old standby," that brings him some of his most deserving candidates.

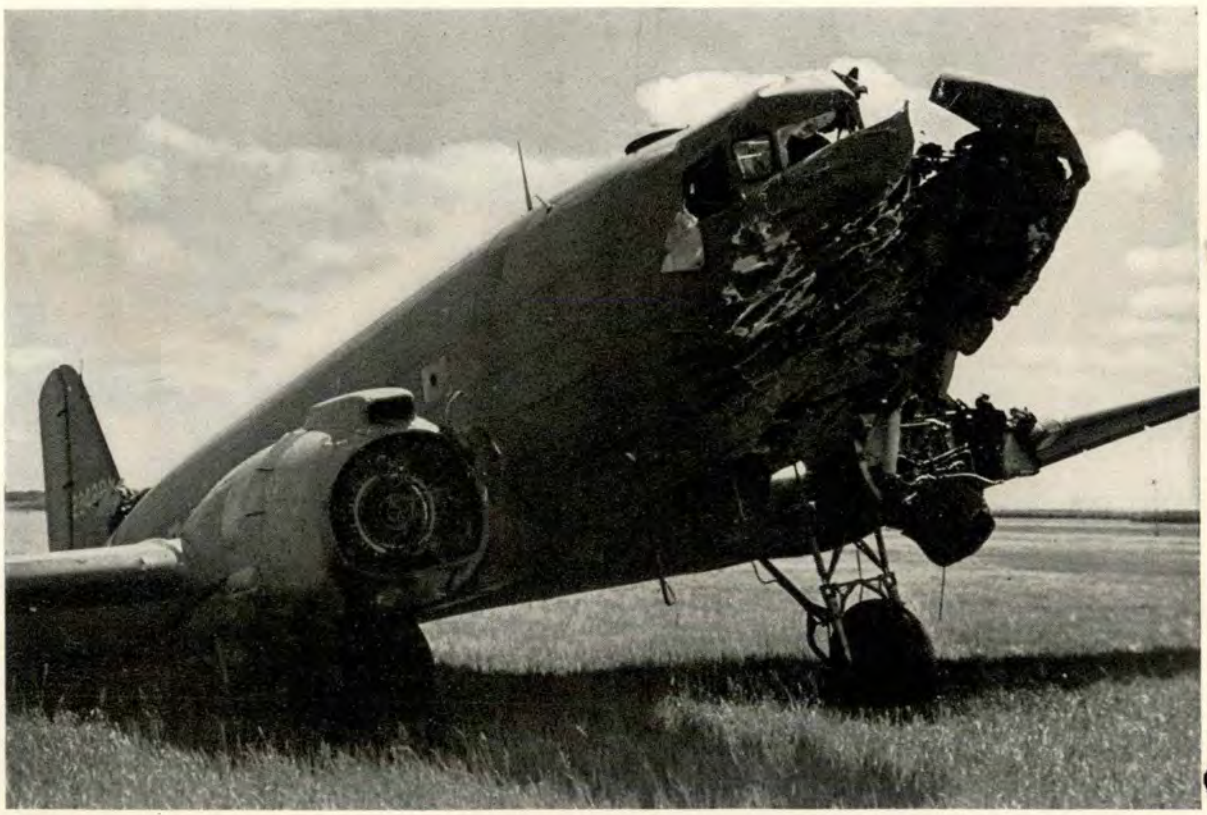
Because the Skytrain has an excellent margin of safety and a splendid record, it breeds a tendency in aircrews to climb aboard, pile the chutes and harnesses in the corner, and hit the blue.

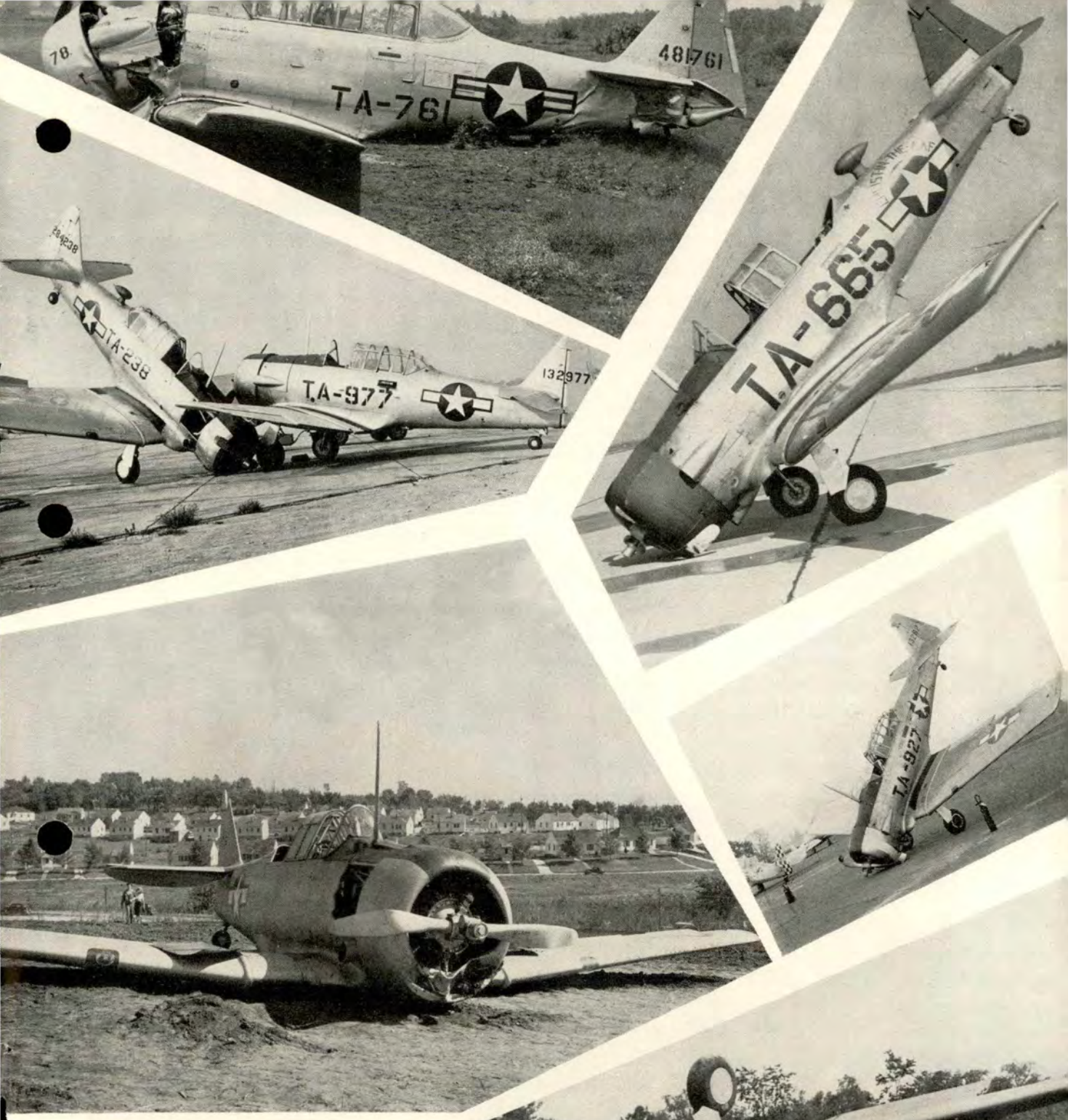
A C-47 was 20 miles from its base inbound on a night round-robin recently. The pilot and engineer were asleep and the copilot was half dozing as the plane flew along on auto-pilot. No one had a parachute on, in fact chutes and harnesses were in the rear. Everyone knew the flight would soon be completed successfully. Suddenly fire broke out in the right engine and the cockpit was filled with smoke.

The engineer went aft for parachutes and harnesses while the pilot and copilot fought the blaze. The engineer returned and helped the pilot into his harness. The copilot left his seat to get into harness. After helping the pilot on with his harness, the crew chief went to the door, jettisoned it, and bailed out. A split second later the right wing gave way. The lucky crew chief was the only survivor.

Of course the crew had every reason to expect the flight to be completed without difficulty if they had made all their preflight checks properly. But they had succumbed to the Lorelei voice of complacency and simply had not bothered to have parachutes handy in case an emergency occurred. A great many flights are completed successfully under such conditions besause the emergency does not occur, but no man has assurance that his next flight into complacency will escape that unexpected emergency. To ignore the *possibility* of an emergency is to demand eventual disaster.

For a man to fail to reduce this danger element to its lowest denominator simply because he is in too big a hurry, too confident, or simply too lazy, is the unchallenged pinnacle of stupidity. The future of the Air Force and the security of the nation are the stakes. Where the chips fall depends upon the action of each individual pilot in the USAF.





33 1/3%

HERE IT IS, the plane involved in *one third* of all USAF accidents. A safe airplane for the pilot who stays alert. Negligence wrecked these.

LOOK OR DIE

DEATH DIVES out of the sun and strikes unwary pilots in combat. That the same destroyer should ride on friendly wings in peacetime and kill is shocking to every airman. Facing the enemy, pilots and crew members kept a constant watch in the direction of the sun, the blind spot for an attack.

While no swastikas or meatballs lurk in the sun today, reasons remain for pilots to be vigilant in peacetime. In heavy traffic and on lonely cross-country flights mid-air collisions continue to take their toll of valuable lives and costly airplanes.

A pilot who had fought off the enemy for 348 combat hours, and had flown in the USAF for a total of more than 2,000 hours, was killed flying into the sun over the peaceful New England countryside. Three other airmen died in the same mid-air collision.

Two airplanes, an A-26 Invader and an AT-11, took off from airfields separated by more than 350 miles, each flying by visual flight rules—the A-26 flying cross-country, the AT-11 on a local proficiency mission from a field near the Invader's destination.

Two minutes before both planes were demolished and all occupants killed, the pilot of the A-26 called the tower at his destination. He gave his position as 10 miles south of the field and requested landing instructions. The information was acknowledged by the pilot and then he asked if any other planes were in the traffic pattern. The tower reported nothing in the pattern.

This communication at 1707 EST was the last. At 1709 the tower operators saw an airplane plunge earthward in flames about two miles from the field. It wasn't until several witnesses called the field that it was realized there had been a mid-air collision.

Pieced together, the evidence showed that the AT-11 had been flying through the local field's control zone without notifying the tower. The A-26, heading in a westerly direction, faced a low sun which, coupled with a haze present at the time, made vision ahead difficult and uncomfortable. As the planes collided, the props of the trainer slashed through the belly of the A-26. The AT-11 exploded on impact with the Invader, apparently blowing the pilot and one crew member of the A-26 out of the plane. It was evident that the lone pilot of the AT-11 and the three occupants of the A-26 all died instantly at the time of the collision.

Contributing causes were poor visibility and the failure of either pilot to see the other in time to avert the collision. With the AT-11 pilot dead, it was difficult to determine why he had been flying below the minimum designated altitude in the area of this field while on a local clearance from another base.

Every pilot has occasion to fly into a setting sun. Although maintaining a careful watch ahead under such conditions may be uncomfortable, the alternative precludes consideration. There is no choice between looking and dying.

FAREWELL SALUTE

THE OUTFIT WAS MOVING. All the airplanes were to be ferried from the old base to a new location by pilots of the squadron.

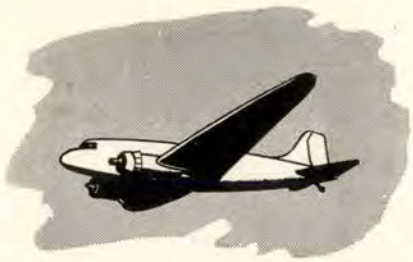
Shortly before 11 o'clock on a sunny morning, three AT-6's took off and joined formation at 1,000 feet. The flight leader, a first lieutenant, circled the field once while his two second lieutenant wingmen got in position. Then he made a decision that cost the life of his No. 2 man. He would give the old field a farewell salute.

He circled away from the field several miles and, without tower permission, started a diving approach toward the ramp. At rooftop altitude he leveled off and screamed across the ramp, causing two members of the alert crew servicing a P-47 to dive under the wing for protection. As he pulled up at the edge of the field his No. 2 man clipped a tall pine tree and the plane shed a wing. The AT-6 rolled on its back, gaining altitude briefly, then plummeted into the dense woods. The pilot was killed instantly.

The implications of the story are obvious. Although the leader of the flight and the other wingman refused to admit they had flown below 500 feet, testimony of numerous witnesses on the ground established that they had buzzed the ramp at minimum altitude in violation of AF regulations. The flight leader was court-martialed.

The flight leader must now live with the knowledge that he wilfully violated regulations and contributed to the death of his wingman. That wingman, with 465 hours total time would be alive today if he had refused to be led into the situation that resulted in his death. But he had been taught to obey instructions.

The subject of when a wingman should break formation is wide open to debate. But it is an unalterable fact that in this case the flight leader took his wingmen into a dangerous situation, forcing them to violate regulations. A flight leader who abuses the loyalty of his wingmen can only end up with no wingmen at all, or with wingmen who have no confidence in his command.



SKYTRAIN SKYLARK

By L. H. MACAULEY
USAF Flying Safety Division

UNDER MANY CIRCUMSTANCES it takes only one mistake made by one pilot to set up a first-class major accident. But when five pilots in one airplane pool their efforts in an exhibition of how not to fly, you really have a flight that's headed for an unhappy landing. And this one actually happened.

Shortly after takeoff from a mid-Texas field, Captain Flannery turned back and landed his C-47 again because of radio trouble. He called the radio mechanic, and they made a ground check of the equipment. The mechanic pronounced all the radios okay except for the VHF receiver, so Flannery decided to take off again for his VFR night flight to a destination in South Carolina.

Now with Flannery and 11 passengers were four lieutenants who had come along to pick up their night time requirements to comply with AF Reg. 60-2. They planned to take turns at the controls while Flannery supervised the flight.

Flannery took off and flew on course for about an hour with Lt. Hobson in the right seat. After establishing his position, Flannery told Hobson to relinquish his seat to Lt. Middford who would take over as copilot and navigate. Hobson went aft to chat with the passengers and was followed shortly by Capt. Flannery who announced that Lt. Manacci had taken the right seat to fly while Middford continued as copilot and navigator.

The flight continued like this for about four hours, changing crews frequently with Flannery checking the cockpit and positions reported by the pilots at 30-minute intervals. Once during this period, he allowed Lt. Crosby, the remaining pilot aboard, to take over the controls in the right seat from Manacci.

When the ETA for one of the en-route checkpoints was up and the pilots were doubtful of their position, Flannery and Hobson, the original copilot, returned to the cockpit and took the controls to attempt to find out just where they were. Capt. Flannery oriented on the loudest radio range he could receive and it turned out to be a station in West Virginia many miles to the north of the intended course. As fuel was running low, Flannery headed for the range some 80 miles distant.

Arriving over the station, Flannery spotted the civilian field through low clouds and ground fog which were forming over a nearby river in the early-morning hours. He dragged the field four times and on the last attempt, set the plane down on what he thought was the runway. Suddenly, the landing lights picked out a row of parked civilian planes ahead of the right wing. Flannery swerved the plane to the left and attempted to raise the right wing. But it was too late to prevent the C-47's wing from grinding over four of the civilian airplanes.

Flannery brought the transport to a wavering halt and got out to survey the damage. None of his passengers or crew was injured, but the C-47's right wing was torn and shredded and four civilian planes would have to spend long and expensive hours in the hangar before they would fly again. To top this off, the embarrassed occupants of the C-47 were still several hundred miles from their destination.

As in all things, there came the summing up. Why this flight in perfectly good VFR weather with supposedly competent pilots aboard had gone awry had to be answered. And the answers weren't hard to uncover.

First, investigators discovered that Lt. Hobson had drawn the original flight line on his maps before the others arrived at operations. Also, other pilots in the flight did not receive the benefit of weather briefing which covered winds aloft and other phases of the weather situation. Capt. Flannery did not check his copilot's calculations because he considered them adequate. Thus, after Flannery relinquished the controls to the other pilots, most of the navigation was performed by guesswork.

Another fly in the ointment was that the crew carried only two strip maps of the course. As a result, when the flight deviated north of its planned

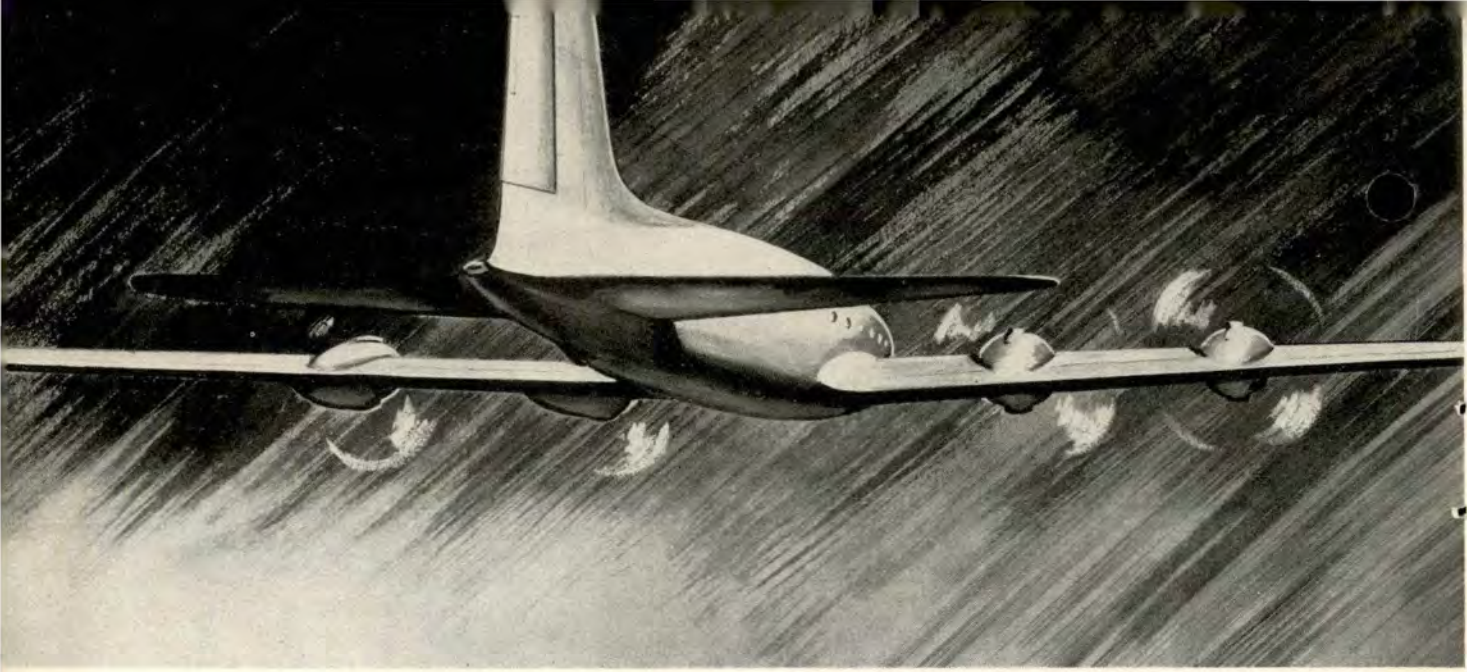
course the pilots were off their maps. Flannery found the West Virginia field on his radio facility charts but he did not notice that the field had no night lighting facilities.

Although the accident was the result of errors made by five pilots, it could have been averted if the airplane commander had made necessary physical checks on their position instead of taking the other pilots' word that the flight was progressing on course. Another thing that would have helped would have been more complete briefing for all crew members who were to participate in the mission.

Each accident growing out of inexcusable errors besmirches the aviation record with an ineradicable black eye. The many errors which got Flannery and the other pilots in trouble are too obvious and numerous to point out. But accidents like this will be repeated as long as pilots consider careful flight planning unnecessary or too much trouble. And flight planning itself will not cure all the difficulties. Precise in-flight checks are a must if planes are to be expected to reach their destinations safely and on schedule.

Preaching and ranting about the dangers of sloppy flying does not seem to be the solution. Some pilots have to learn by example—and many of the examples are horrible. If Flannery's example of head-up flying furnishes to other pilots the incentive to plan flights carefully and to conduct them intelligently, perhaps its high cost might bring a worthy return.

Meanwhile, Flannery and his boys are trying to find answers to some mighty embarrassing questions, and many private citizens who witnessed the end of this skylark are "tut-tutting" about the strange actions and vagaries of Uncle Sam's intrepid airmen.



DITCHING DELIGHT

By ED HAMLIN

USAF Flying Safety Division

THE BEST LAID PLANS of men sometimes go for naught. But this is a tale wherein the plan does not go wrong and lessons and procedures learned with traditional boredom pay off in man's greatest reward, life itself.

It all happened in the Far Pacific a couple of months ago. The C-54 crew on a scheduled cargo transport run from Los Negros to Guam submitted to the usual briefing, now so familiar to the over-water jockeys and their associates. The pilot's check-list showed:

Mae Wests, parachutes, life rafts and safety belts available for all passengers? —Check.

Passengers briefed on fit and use of parachute, fit and use of Mae West, ditching procedure, air discipline? —Check.

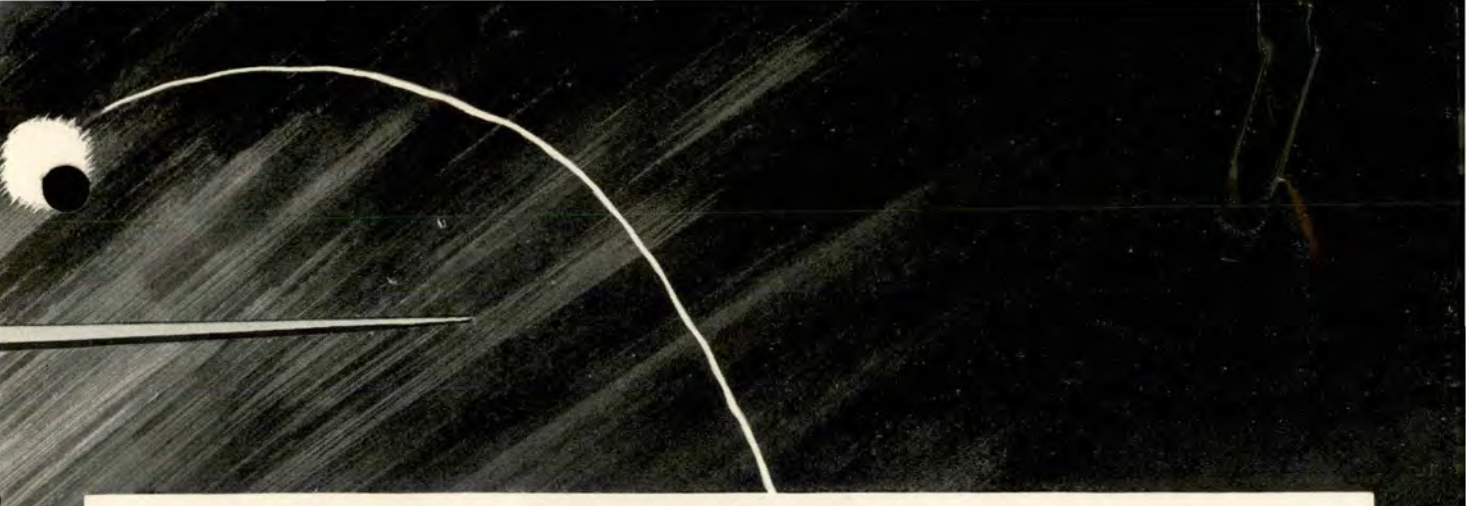
Life rafts adequate and properly stowed? —Check.

As on many another flight by men of experience, confidence was high. This briefing was a necessary routine. It didn't last too long. In no time the welcome signal for "wheels-up" sent the boys into that relaxing of strain that moves in with altitude and the attainment of cruising level.

At 9,000 feet the cruise checklist was completed and the fuel system was set up to feed engines one and two from the left auxiliary tank and engines three and four from the right auxiliary tank. For two and a half hours everything functioned smoothly, all engines indicating "in the green." A small tropical front of moderate intensity appeared on the scene but soon was far to the rear.

The pilot suddenly noticed the fuel level of the left auxiliary was less than the right. A visual check by the pilot revealed what appeared to be a gas leak in the No. 2 nacelle just to the rear of the cowl flaps on the upper inboard side. Further investigation confirmed the leak, and just as the decision was made to feather, a tiny blaze flickered through the slots of the accessory cowling. As the big fan stopped, the fire warning light flashed ON in the cockpit, a hole was burned in the accessory cowling and red sparks began flying through. The fire wall shut-off valve and CO_2 selectors were pulled in a flash but with no apparent result. When yawing and a mild dive had no effect on the fire, the decision was made to ditch.

During the fire-fighting period, the navigator took another fix, the radio operator transmitted distress calls, and the rest of the crew readied emergency equipment including the Gibson Girl, blankets, emergency water, and rafts and stood by to ditch. When the No. 1 engine began cutting out, the decision to ditch became definite. The signal was



given and everybody took positions, backs to the sturdiest surfaces, just like the drills back in transition. The engineer got set in the copilot's seat, the radio operator screwed his transmitter key down and jumped into the bottom bunk, the navigator sat to the rear of and against the cargo. One coplilot stationed himself by the rear door and the other against a partition in the rear, where they had gone to help ready the emergency equipment immediately after the decision to ditch.

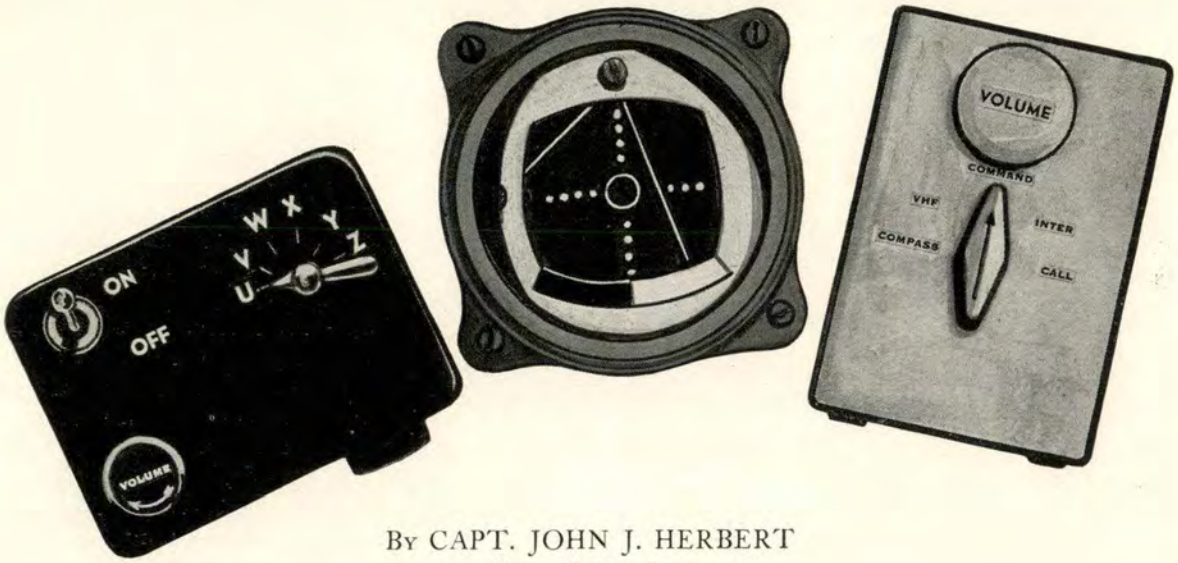
Turning into the wind, the pilot made his touchdown in a normal landing attitude, full flaps, gear up, at about 85 mph. Everybody exited in an orderly manner, getting out four life rafts and the Mae Wests, and proceeding approximately 20 feet from the doomed airplane before it sank three to five minutes later.

Five hours later, following the inevitable seasickness, a rain squall, and difficulty with the Gibson Girl, a searching C-54 flew over and maintained visual contact with the rafts thereafter. A Higgins boat was dropped by a B-17 a few hours later. The boat landed upwind and had no lights aboard, however, and the crew could not find it. At dawn a second boat was dropped downwind and by hard paddling the crew reached it. Thirty-two hours after the ditching a submarine picked them up.

It may be said, and truthfully, they were a lucky crew. But, their luck was predicated on sound training and drill in emergency procedures. The splendid job of surmounting an emergency done by this crew is an excellent example of results to be expected through training and constant, adequate briefing practices.

FOUL WEATHER FRIEND

V.A.R.



By CAPT. JOHN J. HERBERT
Flying Safety Staff

"Punch 'C' channel and see if you can locate a DF homer station. The static is so bad I can't even identify the quadrant signal on this range." The pilot held one hand tight to his earphone, frowning against the crash of static. The other hand gripped the wheel as the B-25 made its way through the severe electrical storm.

For the next twenty minutes the copilot attempted unsuccessfully to contact a homing station. There were terrain obstructions between the plane and the DF homer.

"How 'bout trying one of these VHF Range stations?" the copilot suggested, by this time quite worried.

"Okay, give it a try. We're in a jam, buddy."

"I've never used this stuff, but it says VHF so one channel or another ought to work. Let's try 'A' channel, and if that doesn't work we'll try 'B' or 'C.'"

"Call this station I checked on the Facility Chart," the pilot instructed. "If that doesn't work I think we'd better bail out. These hills run kind of high out here."

And bail out they did.

Seven days later, the aircraft accident board came up with this deduction.

"It is believed that if the pilot or co-pilot had been familiar with the proper operating procedures of the *Visual-Aural Range* equipment [sometimes erroneously referred to as VHF Range], this accident might easily have been avoided." Both pilots later stated that they were not familiar with the equipment.

This flight could have been completed success-

fully if the pilot or copilot had had the know-how of Visual Aural Range flying.

Let's make that flight again on paper from the point at which static rendered the radio compass and command set useless. An immediate check of the Radio Facility Chart at that moment would have indicated that the airplane was in the vicinity of the visual aural range located at Bryce Canyon, Utah.

For the benefit of those readers not familiar with VAR operation the following steps should have been followed to use this equipment properly. First, a check of the Radio Facility Chart indicates that Bryce Canyon transmits on U channel. Next, the ILS control toggle switch is placed in the ON position, the frequency selector to U channel (obtained from the Facility Chart) and the volume control to increase volume.

The next step is to turn the jackbox selector to the COMMAND position. The COMMAND position has been arbitrarily selected and does not mean that reception is obtained through the command radio receiver. The command receiver is turned OFF. It takes a fifteen second warm up before the set is ready to operate. From the known position of the aircraft (see illustration) we will attempt to intercept the airway or visual leg of the range. The visual leg is identified by the symbol V following the bearing numeral.

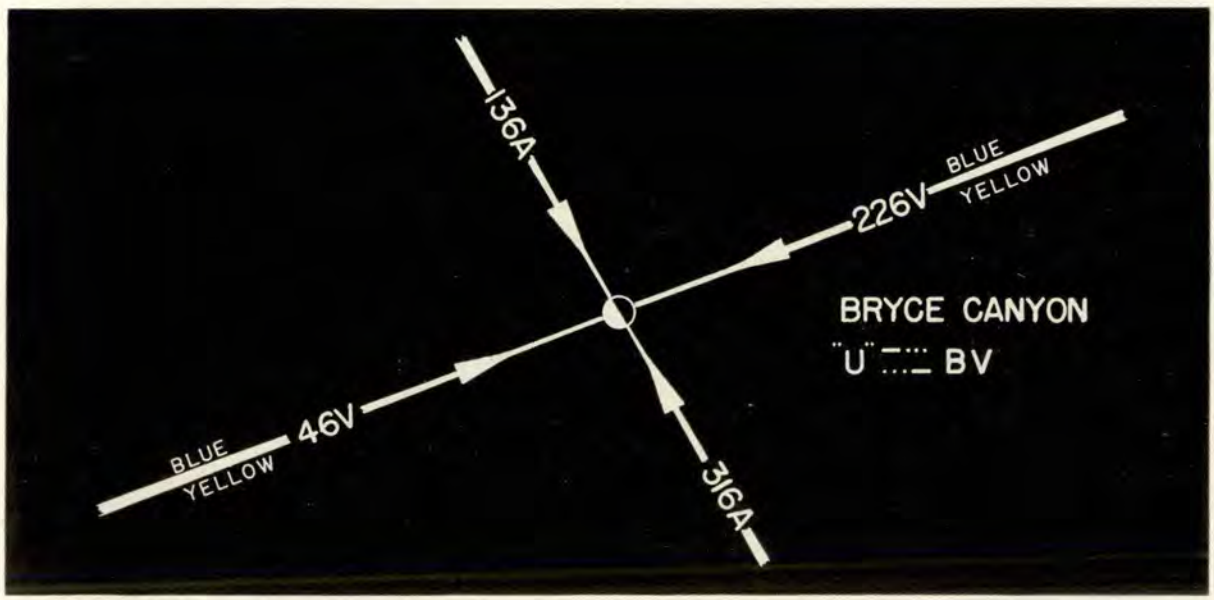
An A signal is heard and the ILS indicator is in the yellow, showing that we are in the southwest quadrant. This quadrant position is transmitted on A channel to Bryce Canyon Radio. Permission is granted via Bryce Canyon station, to hold on the northeast leg for further instructions. By flying a 0° heading from our present position we will intercept the southwest visual leg.

The 0° heading is held until the ILS indicator starts moving slowly toward center. This movement indicates that the aircraft is approaching the visual leg. As the ILS needle becomes centered, a turn is made toward the station until the published beam heading is attained. Corrections for wind are made by correcting the magnetic heading toward the opposite color sector as published in the facility chart.

Remember, on both sides of the visual (or airway legs), the same aural signal is received. One side of the visual leg will give a "blue" interpretation on the ILS indicator, the other, "yellow." Station passage is noted when the blue-yellow indicator moves rapidly from left to right and the aural signal changes from A to N. Now we have established a definite geographic position.

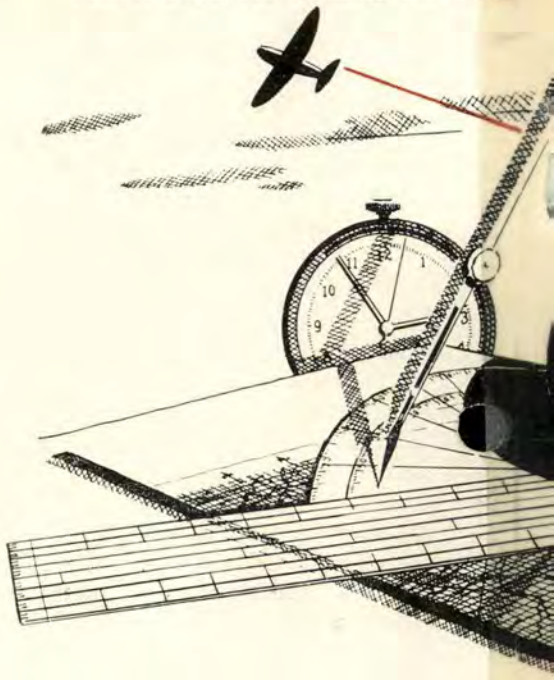
Holding on the northeast visual leg, as instructed, we contact Bryce Canyon on A channel. Our exact position, fuel, etc., is transmitted to Bryce Canyon Radio. We are advised to continue our flight at present altitude to Denver, reporting in at Hanksville, Grand Junction and Eagle.

The weather reported by Bryce Canyon Radio reavels CAVU conditions from Grand Junction to Denver. We're in.



THE INSIDE TRACK

By 1ST. LT. WILLMER R. STURM
Mather Field, Air Training Command



THIS WINTER, many crashes and emergency landings will be the direct result of dry fuel tanks. Navigation negligence will often be the main contributing factor. Numerous emergencies occur during the winter months when pilots blame fresh blankets of snow for their failure to locate navigational check points.

Definitely, snow does obscure many landmarks and usually makes the navigating pilot's task more exacting. However, the difficulty often lies not in the snow hazard, but in the pilot's own lack of emphasis on preflight navigation planning. Preflight preparation must always include consideration of the conditions expected en route.

Successful completion of a winter flight naturally depends on the abundance and reliability of navigation instruments aboard, the amount of time available for navigating by the pilot-navigator, and the amount of preflight planning that goes into the problem of navigating.

Since the amount of time available for navigating and the number of instruments aboard are subject to little variation, it is evident that *most of the navigating failures and resultant accidents are caused by insufficient and inexpert preflight considerations.* Careful preflight planning will put you on the inside track to accurate navigation.

Effective preflight planning is the key to reduction of winter navigation accidents. Preflight planning does not merely involve plotting a course, arcing off distance-intervals, and determining the frequency and status of radio at destination. The pilot-navigator's preflight planning should also include determining the predicted wind and its effect upon the airplane in flight. In addition, preflight planning for the pilot-navigator should include a detailed study of the route to be flown, a review of AACS aids en route, and a study of predicted weather.

Wind is the important factor that escapes adequate attention of many pilots. An ignorance of wind direction and velocity is usually the reason for scooting miles beyond or pulling up short of destination at the expiration of a "figgered" ETA. The careless use of indicated airspeed in place of ground speed for computing time en route frequently results in ludicrous predictions of ETA.

To pre-compute the metro ground speed takes only a few moments before takeoff and will provide accurate ETA's at check points. Well-defined check points with their appropriate ETA's adjacently noted are much better than 20- or 30-mile increments marked off on the chart. ETA's to prominent check points can be scaled or adjusted as the check points are passed. This reduces the ETA error to subsequent check points.

After flight planning, the next important navigation consideration, is the beginning of the mission just after the course is set. If possible, the first check point should not be more than 10 minutes' flying time from departure. In most cases the climb will have been completed and this point can be used as a starting point for figuring ground speed to future ETA's. This first check point can be invaluable in getting an indication of the airplane's track. If the first check point is 40 minutes out of departure the pilot may have considerable difficulty in locating himself after that interval of time, especially if check points are scarce and the ground speed and/or the track is much different than expected. Hence the need for this first check point to be close in.

To take advantage of this simple and effective method of navigating, one must pre-compute reasonably accurate magnetic headings and ground-

speeds. Approximate drift correction can be determined by checking wind direction relative to the true course and apply a few degrees correction into the wind. In flight, follow through in adjusting the heading by reference to the check points in a manner similar to following course on a radio range leg.

In determining ground speeds and ETA's it is preferable to work with knots and nautical miles. In preflight planning before the ground speed can be determined, true air speed must be computed. For this purpose an approximation is all that is necessary. Below 13,000 feet it is reasonable to assume that the true air speed in knots is equal to the the indicated air speed in mph. Determine a ground speed by approximating the headwind or tailwind component of the predicted wind. If the wind is practically a headwind, subtract its velocity from the true air speed to get ground speed. Conversely, if the wind is approximately a tailwind, add its velocity to the true air speed and find ground speed. In a near calm or with crosswinds, the ground speeds will not be appreciably different from the true air speed. With quartering winds, the head or tailwind component can be estimated and applied to the true air speed.

After computing the ground speed and figuring ETA's to the selected check points, the pilotage mission is ready to begin. The next objective is to determine how well the predicted ground speed and heading is holding up by comparing the ETA's and ATA's at the primary check points and adjusting the subsequent ETA's from errors noted at those first few check points.

The selection of appropriate check points is important, but selections will vary, depending upon weather, visibility, terrain features, and the abundance of visible cultural features. For example, over snow-covered terrain the selection would not include streams or feeder roads, but rather main arterials, towns, prominent peaks, and cities, with beacons, light lines, cities, etc., used at night. Even these check points may be obscured or barely visible. Hence, there is a need for detailed preflight planning and accurate computations.

It is desirable that these check points be the type that extend perpendicular to the track or at least be visible from several miles off either side of course. If the plane has drifted very far off course the pilot-navigator may miss less prominent check points altogether.

Good pilotage procedure is not avoiding radio orientation. For the radio range, bearings, single and multiple station fixes, are as much a part of navigation as the pencil itself. The danger lies in total dependence on radio aids. If your radio contact is lost, you are lost.

Salient points in adequate pilot navigation are:

a. Careful, complete, preflight computation, including ETA's to appropriate check points.

b. Follow the flight plan in the air, adjust the heading and ETA's in flight to remain close to course and develop accurate ETA's to subsequent check points. If the flight plan and flying regulations are rigidly adhered to, and coupled with good aero-reasoning, the pilot-navigator can never be accused of navigation negligence. Failure to prepare and use a flight plan is not an indication of superior skill, ability and experience but only an indication of negligence, carelessness and laziness.

CREW BEFORE YOU CROW

By M/SGT. F. R. HARRIS
Crew Chief 8th AF Base Unit

IF YOU HAVE HAD anything to do whatever with the flying or maintenance of Air Force planes for a number of years, I am sure that you will understand some of the reflections that occasionally come to the mind of an old maintenance man. Now I'm not one of the oldest, not by halfway, but in my 15 years of service as a mechanic I've learned a lot from the old timers.

First, let's start with the man—the crew chief—not of today, but of yesterday. Do you remember him — an airplane mechanic who crewed his airplane, a mechanic who knew everything about his plane and how to repair or maintain every part or accessory on it, a crew chief who could explain in detail to the pilot just exactly how everything worked, the wiring from nose to tail section or from wingtip to wingtip? He knew where each worn spot was and even where a wire may not have been anchored as firmly as it should have been. Why? Because he crewed his plane. He knew his plane. He pulled daily inspections.

Sure, sometimes they took an hour or sometimes two hours, but when that black initial was put on the Form 1-A Daily Inspection column it meant just what it said:

"Thoroughly inspected and found O.K. by me. Yes, me. I am the crew chief and I am responsible for that daily inspection. I am a mechanic. I pulled that daily inspection and I will be responsible that everything was done that I was supposed to do and then some. Because I am going to have to pull that 50 when it comes up, if I do a little every day, especially in keeping it clean, I will have a hell of a lot less to do when that 50 does come up. Somebody else work on that plane? Sure, somebody can help me when I am around, but brother, let me tell you this, no one is going to touch that airplane when I am not around. That is my baby. I am responsible for it. I am the crew chief, and if anything happens to it, I want to know all about it."

The plane of those days? Let us look it over—a P-12, PB-2, A-17, or B-18. Yes, in those days you could look at it inside and out. It was just like it had come from a show room—paint new, metal shining and clean, cockpit clean — everything new looking. How old? Seven or eight years. How many hours? Thousands.

Now let's get back to today. Here has been the reaction of some crew chiefs:

Airplane running a little rough? Airplane dirty? Oh, to hell with it. It will soon be going to periodic maintenance for a 50-hour. Let those guys fix it. That sack of bolts is about ready to fall apart anyway. It has about 1,500 hours on it. All I've got to do is keep gas and oil in it. I cannot be responsible for the way it runs, that is those guys' fault up at periodic if the thing quits. We'll send it back up there for an engine change or something."

A year or so ago that might have been dismissed because we had nothing but recruits and had to get along the best we could with men who did not care whether they were in the Air Force or not. Now most of the men we have on the line are volunteers who will stay in the Air Force as a career.

We can't be Sloppy Joes putting in our time from day to day. We crew chiefs are the guys who make the regular Air Force what it is. If you are in the regular Air Force and are assigned to a job, brother, you had better make it your business to be the best man there is for that job or you will soon find that the best man is going to take your place. Nobody can give you that incentive. You've got to gain it yourself and keep it.

Talking again about the old timers, though, we don't want to jump off the deep end and assume that the best maintenance of 15 years ago is good enough today. Planes are more complicated now, demand finer work and more accuracy in all adjustments.

Take the recent case of a particular A-26 which crashed because of gear failure. Normal and emer-

gency procedures were tried by the pilot for two hours in the air with no results. The left main gear stayed up and locked. Finally, a wheels-up landing was made.

Before that crash, on four occasions, landing gear trouble had been experienced in that particular airplane. Each time an adjustment was made and the gear worked. The last adjustment on the latch overlap had been supervised by a factory representative 15 days before the crash. Yet not one had been accurate enough. After the crash the gear was checked and it was found that the DOWN and UP latch had been adjusted to 31/64 of an inch instead of 20/64. This 11/64-inch mistake was costly. Operating with a faulty setting, the latch finally jammed.

Often, when old crew chiefs talk about the past, they recall how gasoline smelled like gasoline, and most of the planes took the same fuel. Now, with jet engines as well as high-powered reciprocating engines, the boys on the line have to be wide awake when they pump fuel into a plane.

The alertness of a crew chief at a U. S. field prevented us from learning whether a C-47 would fly on JP fuel. A tractor carrying a "100" tag on its radiator pulled up to the C-47 with a fuel trailer in tow. While in the process of servicing the second tank, the crew chief evidently spilled some of the fuel on his hands or clothing and made the remark that the fuel did not feel or dry like 100-octane gasoline. The driver then checked the trailer and discovered that it was JP-1, jet engine fuel. Needless to say, the C-47 tanks were drained and serviced with the proper 100-octane gasoline.

What had happened was that the JP-1 trailer had been moved to the servicing line by a tractor also used to pull gasoline trailers. This move took place just before the time of an alert crew shift and the driver being relieved did not remove the tractor from the trailer nor did he remove the "100" tag on the tractor's radiator. While the trailer was clearly marked JP-1, the new driver did not check the trailer markings, nor did the crew chief notice them until he spilled some of the fuel.

That story illustrates what maintenance people mean when they say "don't take anything for granted. Check and make certain."

You can talk to old pilots and old crew chiefs. They will tell you how much more skilled a man has to be today to call himself a good maintenance man. As planes fly faster and faster, they require more accurate servicing and adjustments. Just like our line chief says, "Get out there and calibrate before you celebrate."

THE BONE WEARY FORT

NUMBER 588 was a weary B-17. The Florida sun beating down with all its July ferocity reminded him of the sunshine in the South Pacific where he had flown nearly every day for a month before finally taking part in the big Bikini A-bomb tests.

Number 588 had thought when he returned safely from his two trips into the radioactive storms above the Pacific as a research "drone" he would be put out to pasture. But no such luck. Here he was back in the States, back in the same old rut. Up and down, round and round the field in one radio-controlled landing after another. As he rolled down the ramp after the third landing, he cocked a nacelle longingly at the cool, shady depths of the big hangar. Maybe he was through for the day.

But he rolled on by the hangar as the Beeper pilots down at the end of the runway turned him into position for another takeoff. The safety crew sat idly in their positions, watching the scenery and the sweating radio control crew. Why didn't they turn off that infernal control switch and take him in to the hangar. Couldn't these guys see he was bone weary?

He sat in the blistering sun while the crew made the pre-takeoff check. He had to sit and wait for half a dozen landing planes to get out of his way. The longer he sat the madder he got. What was wrong with these eager beavers? Didn't they know when to quit?

Finally he rolled down the runway and lifted his weary hulk into the sky. Slowly he pulled his wheels up into their nacelles. If he couldn't go into the hangar at least he could fly around up where it was cool for a while. He turned left a mile from the field, climbing slowly as his gaze sought the fleecy clouds up where it was cool and smooth. Hey, what was wrong?

Inexorably his wings tilted and he started another left turn. Those egg heads on the ground were taking him around in the traffic pattern again. He was going to shoot another landing. That was the last straw. If those guys didn't know when to let up he'd bloody well teach them. This stuff was for the birds.

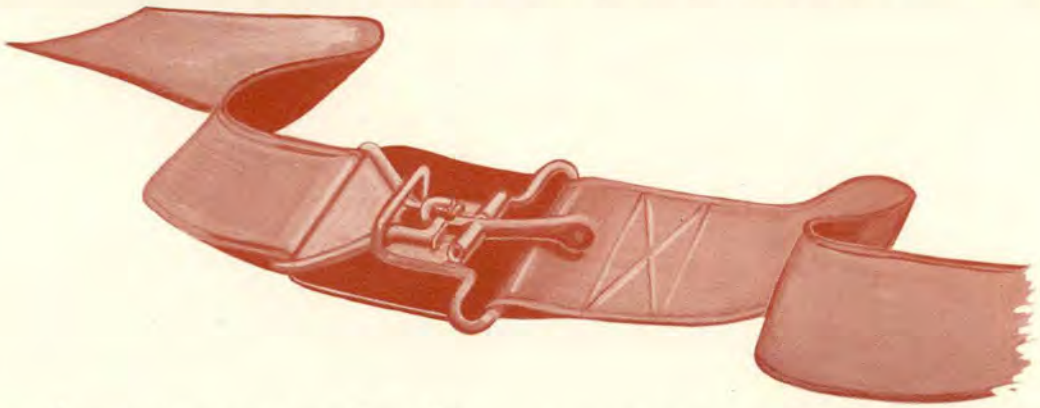
On the downwind leg his gear started down. "That was it, the gear. Why hadn't he thought of it before?" He looked back at his right wheel and chuckled throatily as the crew advanced the prop controls for the landing.

Down the final he could tell when the landing crew took him over at 800 feet. The rudder control pilot had him lined up right down the middle. That was fine. As the ground swept up the elevator controller leveled him off nicely and set him down in three-point position. About here ought to do it.

With a quick shudder of his right wheel he threw the drag link off and reached for the ground with his right wing tip. He felt the safety pilot take over and hit the left brake. "No use, buddy," he thought maliciously, "you had your chance and wouldn't quit when you were ahead. Now I'm running the show." He grabbed the ground with his wingtip and spun 90 degrees to the right and stopped in the soft sand beside the runway.

As they towed him in to the hangar, Number 588 grinned to himself. It wasn't the long rest he knew he was in for that tickled him. He was thinking about the headache the accident board would have trying to pin his accident on one of the four pilots supposed to be flying him.

FOR WHOM THE BELT HOLDS



"MIND IF I GO ALONG on this trip, Captain?"

"Not at all, get your name on the clearance and snap it up. We're about ready to shove off."

"Yes, sir." Pvt. Sullivan climbed aboard an alert jeep and headed back to operations. As he gave the operations clerk his name, rank, and serial number, he felt good. He was getting his first ride in an airplane.

The next problem was a parachute. The jeep driver waited impatiently until he finally got one. As they drove up to the transport the copilot asked Sullivan if he had ever flown in a '47 before. Sullivan replied, "No sir, in fact this is my first trip in any airplane."

The copilot briefed the three passengers on the proper method to bail out. Pvt. Sullivan stumbled up the steps, by this time feeling slightly nervous at the prospect of his first trip into the blue. He put his 'chute on, sat down and immediately fastened his safety belt. The other two passengers just wandered about the cabin.

"What are you sweating about, soldier," asked one of the passengers, "there's nothing to it. Once you're off the ground you hardly know you're moving." About this time the engineer came aboard with a couple of spikes with long red ribbon attached which he threw in a corner. As soon as the engineer had entered the forward compartment the engines started turning over. In what seemed to be no time at all, the airplane was lined up on a runway for takeoff. About this time Sullivan was half wishing the jeep hadn't waited for him. The pilot ran both engines up and released the brakes. The airplane accelerated rapidly, in fact, both passengers standing at the windows were nearly thrown to the floor.

Two minds with but a single thought—to get behind a safety belt. As far as Pvt. Sullivan could recall neither passenger was able to put on a safety belt because of a swinging motion of the C-47 from left to right. The airplane swerved sharply to the right and ran about four hundred feet on a dirt shoulder of the runway before it became airborne. A few seconds later there was a sudden lurch followed by an explosion. The two passengers were hurled to the end of the cabin. Sullivan could only recall unfastening his safety belt and running from the wreckage. He tried to go back to the airplane to haul the passengers out but fire stopped him.

The attempted takeoff was made under the hood. After becoming airborne the C-47 struck a parked GCA truck, lost a wing and landed in an inverted position. The airplane was completely demolished. Four people died. Only Private Sullivan survived. He walked away with minor injuries sustained when he fell to the ground after he released his safety belt.

MEDICAL SAFETY

CRASH PROCEDURES

By JOHN O. MOORE
Medical Research Analyst, Hq. USAF

NOT LONG AGO the crash phone at the dispensary of a USAF hospital sounded off with a jarring clatter. The medical corpsman sitting close by grabbed the phone and reported in on the crash circuit. Immediately after basic directions were received, the driver and corpsman rushed out, jumped into the ambulance, and took off with a roar! The crash convoy was assembled and, with red lights blinking and sirens going full blast, sailed through the front gate and down the road away from the base.

After a 10-mile chase, another ambulance from the hospital carrying the crash kit and the medical officer who had been left behind in the rush managed to catch the convoy, and transfer both the personnel and equipment.

This is not a tall tale but a situation which actually occurred. The equipment had been removed from the ambulance that morning for checking and inspection; someone very carelessly had failed to replace it. This comedy of errors could have happened easily on any base at practically any time.

Existing regulations leave, to a large extent, the organization and training of crash crews and procedure to the discretion of the various commands and bases. In view of the wide variety of locales and tactical situations, it is easy to understand why this is the case. The base level flight surgeon, operations officer and flying safety officer have a very grave responsibility in the organizing, training, and equipping of crash rescue units. The purpose of these units is to reach the scene of an accident, remove endangered personnel, and prevent further loss of Air Force equipment and destruction of private property. These functions can only be accomplished when personnel have been adequately trained in the use of equipment and procedure.

By the very nature of the excitement which surrounds a crash call, it is easy to see how chaos and confusion can quickly gain control of a situation. Constant changes in personnel and improvement in equipment dictate frequent lectures and practice runs. The training must be of such a thorough nature that, in the stress of excitement, reactions are almost automatic.

Crash ambulances must of necessity have two-way radio communications in good working order. Road maps of all main roads and by-roads must be included. The cab of the ambulance should have a large size aerial map of the surrounding area with grid lines drawn in. A system of numbering or lettering the grids is very necessary.

It is also possible to construct additional medical chests and have them suspended in an adequate manner from the sides or ceiling of the back of the ambulance. These chests can be used to carry equipment which each base has found helpful in handling crash calls in its area. By placing locks on these chests, it is possible to leave narcotics and other supplies in the ambulance without the chance of their being removed. The modification of an ambulance to carry adequate oxygen for at least 30 minutes is considered a necessary measure. Posted in a conspicuous place in the cab of the ambulance should be a chart of aircraft-to-ambulance visual signals to be used in the event radio communication with spotting aircraft is impossible. A suggested set of these signals may be found in the Flight Surgeons' Reference File, AF Manual 25-0-1. All equipment in the crash ambulance should be checked and serviced each day.

An ambulance crew and enough alternates to cover any situation should be thoroughly trained by

lectures, demonstrations and practice runs to utilize all equipment. The ambulance crew, as well as the doctor, should keep in mind that their job is primarily concerned with the provision of medical assistance. The fire chief or senior crew chief is in complete charge of all crash operations, directing fire fighting and rescue; however, it is possible that the medical officer and first aid man can be of assistance in the first aid training of other members of the crash crews.

In cases where crash crews reach the scene of the accident and discover that personnel involved in the acident have been fatally injured, it is imperative that a thorough search of the area surrounding the position of the bodies should be conducted. Often this search will locate items which will assist in the identification of the crew members. Under all conditions, spectators should be kept at a great distance from the site of a fatal crash.

All members of the crash crew should thoroughly understand that the purpose of the crash run is to reach the scene of the accident. Unusually fast or reckless driving, particularly across open country, will seriously jeopardize the accomplishment of this aim.

Some time ago, a crash crew left the base in great haste to reach the scene of an accident in which a single-engine airplane had come down in the desert. After the convoy left the roadway and traveled for some distance across open country, it reached a dry river bed. Over two hours' time was spent riding up and down the river bed looking for a suitable crossing. The convoy finally reached the scene of the accident about an hour after nightfall. The vehicles had to be left over a mile from the actual point of impact.

This story illustrates the importance of adequate planning, coordination of grid and road maps, and training of drivers as a necessary adjunct to the successful completion of a crash call. Proper consultation of grid maps and road maps would have disclosed the existence of the dry river bed and made unnecessary two or three hours of rocking, bouncing, and riding over arid desert wasteland.

It is recommended that flight surgeons, flying safety officers and operations officers examine crash equipment and crash procedures in use at their bases with a critical eye for the purpose of detecting weaknesses in present procedures and take immediate steps to improve training and equipment so that the next time the crash alarm goes off, the pilot involved in the accident will be assured of properly trained help reaching him as quickly as possible.

GLIDE TO SAFETY

How FAR can an airplane glide from any given altitude if all engines conk out? This is a question that has been asked many times by pilots.

Not long ago a pilot in a P-80 was reported to have glided 80 miles to a safe landing after the jet engine failed at a high altitude. The plane was over open sea and the pilot made a good show in saving the plane and himself by making use of gravity.

Almost at the moment our staff was talking that one over an interesting study on the subject arrived from Boeing Aircraft Company concerning the gliding distance of the B-29. Boeing engineers figure that a glide ratio of 15 to 1, that is, 15 miles for-

ward for each mile of altitude, is approximately representative of a clean, combat B-29 airplane with all propellers feathered.

With wing flaps up, gear up, and all props feathered, a B-29 weighing 110,000 pounds was found to achieve its maximum glide range at 185 mph. The same weight airplane with 45 degrees of flaps, gear extended, and all props feathered made its best glide at 137 mph. In the first instance, the glide ratio was 17 to one, while in the latter, with flaps and gear down, its gliding range was only seven to one. With 25 degrees flaps and gear up the 110,000-pound plane glided at 12 to one.

For a given glide angle, Boeing discovered, it makes no difference whether an airplane is fully loaded or empty, the gliding angle will not be affected. The fully-loaded airplane will glide faster than the partially-loaded airplane because weight does affect airspeed necessary for any given glide ratio.

WARM 'ER UP

Several accidents in P-80's have resulted lately from pilots landing with forward visibility restricted by moisture condensation on the armor glass of the windshield.

This condensation frequently results when descents are made rapidly from high, cold altitudes. After a rapid descent is made from cold upper air

regions, it is sometimes necessary to fly a few minutes at lower altitude to allow the armor glass to warm sufficiently to dissipate moisture condensation.

Unless in an emergency, no pilot is in such a great hurry he can't circle a time or two at lower altitude to allow the moisture to clear from his windshield.

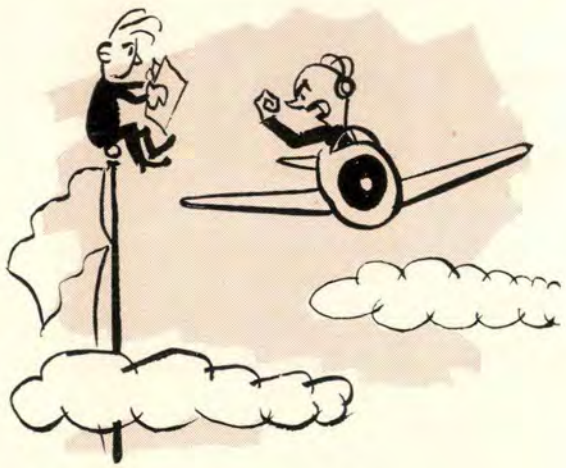
MACH MOXIE

To determine accurately the highest speeds at which aircraft can be controlled safely, Mach numbers have come into use as a speed gage instead of miles per hour among aircraft manufacturers.

Since altitude changes the speed at which an airplane can be flown safely, engineers use Mach numbers as the speed ratio. An airplane flying at 500

miles per hour at sea level meets an entirely different compressibility problem than if it is flying at 500 miles per hour at 40,000 feet. Mach number gives a ratio of the speed of the airplane to the speed of sound. At sea level, Mach 1 is 762 mph, while at 40,000 feet Mach 1 is 663 mph.

A North American jet fighter recently reached a Mach number of .87 in a dive. That's the highest Mach yet announced for an American tactical airplane. The plane was pushing to within thirteen one-hundredths of the speed of sound.



COLLISION HAZARDS

A collision with a radio tower in Illinois sent the pilot of a private plane and his passenger to their deaths. Likelihood of this being duplicated along established airways is diminishing as airline pilots' associations and the CAB consistently fight the erection of such towers on the airways, on a path ten miles on either side, or in traffic control centers. Any pilot is correct in reporting to the CAB the erection of any such hazards in traffic, and especially if such hazards are not marked.

DIVE AND SEEK

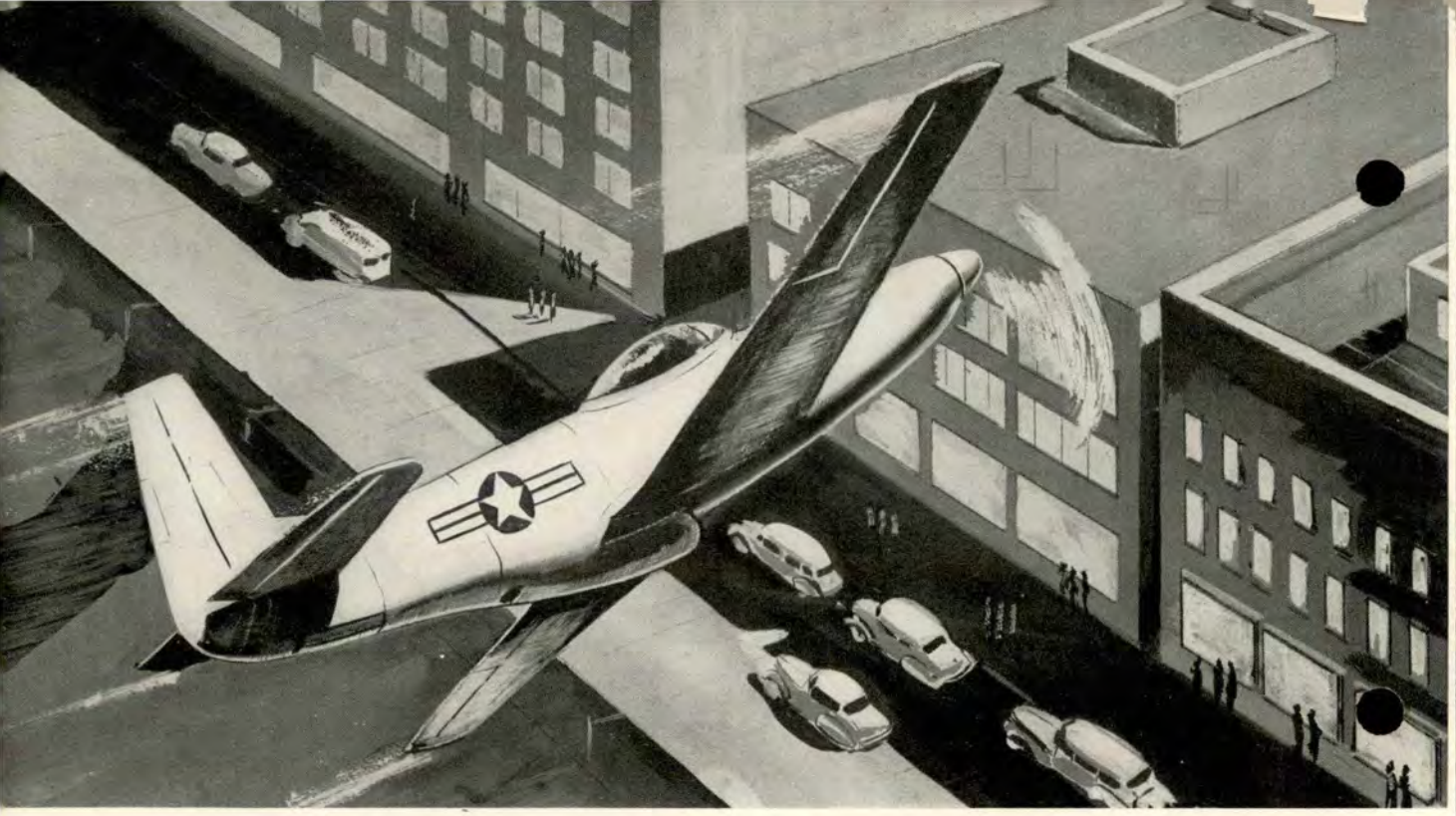
When an airplane has crashed into the sea or other deep water and there are no survivors the cause of the accident can rarely be established. Recently, however, the British Naval Air Arm has employed divers to discover what happened to its pilot and plane.

British air engineering officers and aircraft maintenance inspectors have been schooled in diving with the result that causes of accidents have been determined on the bottom of the sea.

The diver is able to note the position and settings of all controls, hatches and gages, before the plane is moved by a salvage crew. If the pilot has gone down with the airplane, the diver tries to discover what prevented him from leaving the plane, whether from injuries received or equipment becoming jammed.

In addition to an on-the-spot investigation of the wreckage, the diver is often able to attach the correct type of salvage gear so that the plane can be hoisted to the surface with a minimum of damage for detailed technical examination.

The value of such recoveries was clearly shown during the investigation of a structural break-up of a new plane on its test flight. The wreckage was scattered over a wide area near the Thames. All the parts were recovered except the pilot's canopy and it was decided to continue the search for it. Sure enough, the canopy was located after an exhaustive search and the initial cause of the crash was found to be the accidental jettisoning of the canopy.



VIOLATION!

It was hot in the small room where the court martial was being held. The witness frequently mopped his brow with a large white handkerchief as the board president questioned him to establish his identity, occupation, etc. The president then asked him to state in his own words what had happened on the day in question. The witness straightened his tie and replied something like this.

"It was a little after lunch and I was in the kitchen painting. I heard a roar like a plane in a power dive. The noise sounded like a plane was diving right into our house so I rushed out in the back yard. I got out just a second too late to see him though. I knew he had just passed and plenty close because all the trees in the yard were leaning toward the east the way he had gone. I heard him circle around and then he came right back over again, not over a hundred feet high. I got the number painted on the bottom of the wing and went inside and called the police."

The pilot on trial squirmed uneasily in his chair while the president questioned further and the witness gave an accurate description of the P-51 the pilot remembered all too well.

Other witnesses followed, each quoting the aircraft number correctly, each giving the same description of the pilot's low altitude maneuvers over the southern portion of St. Louis.

On the stand the pilot admitted he had flown low over the town to attract the attention of his folks. His only defense was that he could have glided across the river to open fields in case his engine had failed. He was found guilty of violating the 96th Article of War.

He was fined $600.00 and his period of probationary service as a regular army officer was terminated. In addition he lost three months' flight pay during the time he was grounded for investigation.

This case is typical of the retribution being reaped by violators of flying regulations in the Air Force today. It is difficult to comprehend why a man will place in jeopardy his life, his aircraft and his military career for the sake of a few minutes of reckless flying.

THIS PLANE WENT AROUND

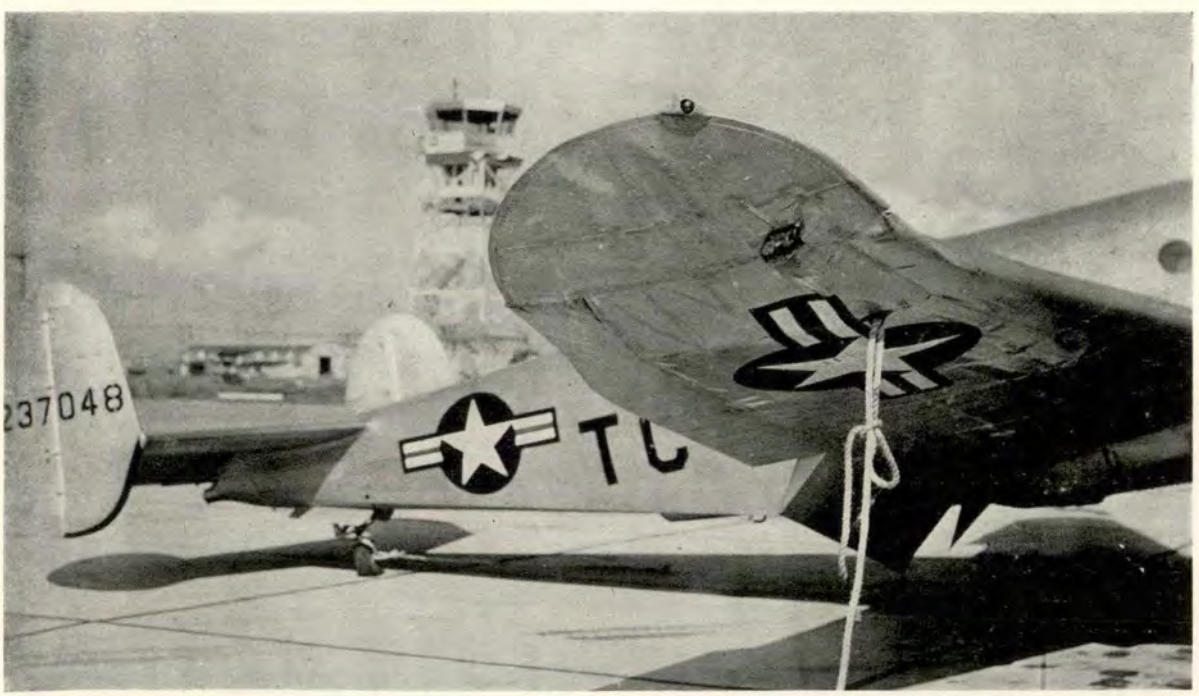
EVENTS DURING THE recent war, some of which were highly publicized, made it a matter of general information that USAF aircraft can suffer severe damage and still fly under the handling of a skillful pilot. However, since combat missions were ended few examples of this phenomenon have occurred. This story indicates neither pilots nor planes have lost this facility.

A captain instructor pilot was in the right seat, and a second lieutenant was flying the plane from the left. The mission was a night proficiency flight. Two passengers were aboard.

The pilot advanced the throttles for takeoff, and the plane rolled straight down the runway. At approximately 60 mph. he pulled the plane off. Sufficient speed had not been attained to make the plane stable, the left wing dropped and the plane started an upward turn to the left. The maneuver was sudden and sharp, so the instructor grabbed the controls, calling out that he was taking over.

The pilot failed to hear him, however, and both pilots put in a hard right aileron correction. The plane see-sawed back and forth for a few seconds as both pilots attempted to straighten it up. They overcontrolled and the right wing scraped the ground, freezing the aileron. About this time the pilot heard the instructor pilot say "I got it," and released the controls.

The instructor pilot managed to straighten the plane out despite a frozen aileron and climbed up to pattern altitude. With extreme difficulty and maintaining the best margin of speed he could attain, he flew the crippled plane around the pattern and brought it in for a successful landing. Although the instructor was in error for allowing the initial act which caused damage to the plane, he displayed exceptional piloting skill in landing the damaged plane safely and averting a possible crash and injury or death of the occupants.



THAT ODD

"IT IS THE OPINION of the board that there was a fuel leak . . ."

A P-47 pilot was flying at 11,000 feet over Guam on an acrobatic training mission. He did one roll and noticed gas fumes in the cockpit, so he leveled out, opened the canopy, switched gas tanks and throttled back a few inches. The fumes cleared. Thinking everything in good shape, the pilot flew two more rolls and again noticed gas fumes. The same procedure was followed to clear the fumes. This time he flew straight and level for about ten minutes to check again on the source of the fumes.

Everything then appeared normal and he did a few lazy eights and went into a medium dive. On the pullout the engine coughed. Fuel pressure dropped to zero. Emergency fuel boost was applied without increasing the pressure reading. Yet after the first cough the engine continued to run smoothly.

The fighter pilot called for an emergency landing, made a normal pattern and turned on final approach. A little short, he gave it the gun, but the engine did not respond. The runway was reached, however, and just as the fighter touched down flames streaked around the fuselage. With the cockpit rapidly turning into a furnace, the pilot braked and deliberately groundlooped to slow down enough so that he could jump out and run to a safe distance.

The fire fighting crews were unable to stop the fire before the fighter was a complete loss.

"It is the opinion of the board that there was a fuel leak . . ."

An A-26 had just taken off from a base in Japan when fuel pressure on the right engine dropped to 9 PSI and the plane yawed to the right. The pilot completed the emergency procedure with a minimum time lag, after the manifold pressure dropped to 29 inches and movement of the throttle produced no change in the reading. By the time feathering was completed, gasoline was noticed coming from the top of the engine and dense smoke filed the bomb bay. The pilot turned the A-26 toward the field and was cleared by the tower for a straight-in approach.

Fire enveloped the right engine nacelle as the plane touched down. After rolling halfway down the runway, parking brakes were locked full on and the left engine magnetos were turned off. Both main tires blew out through the sudden braking. The plane stopped on the runway and the pilot and his crew member jumped safely to the ground.

"It is the opinion of the board that there was a fuel leak . . ."

The pilot of a Georgia National Guard P-47 smelled gasoline fumes after starting his engine, but thought the fumes to be no stronger than the usual vapor odor after servicing. During the pre-takeoff check, the plane operated normally. On the takeoff

FAINT OR

roll there was a loss of power and the odor of gasoline became stronger. The pilot decided not to complete his takeoff and slowed down to a stop at the end of the runway, then pulled over to a taxi strip to clear the runway for other planes. Upon doing this, his engine loaded up and stopped firing. Mixture control was moved from RICH to IDLE CUT-OFF and the engine started running again. The pilot advanced the mixture to AUTO-LEAN.

Clearance was received to taxi back to the line. As the plane started to roll there was a slight explosion and it burst into flames. Fire enveloped the fuselage. The pilot jumped out.

No lives were lost in any of these fires which might have been avoided by careful preflight inspections of fuel and oil systems by pilots and line personnel, but damage to the three planes was costly. The first P-47 was a total loss. In the case of the A-26, the right nacelle, wing flap, engine and accessory section were damaged beyond repair. Fire buckled the left wing of the National Guard P-47 at its root, did major damage to the engine, accessory section, and cowling.

In no case could the exact source of the fuel leaks be determined because of the extensive destruction of the parts by fire. In each case the investigating boards decided that fuel leaks were the probable causes.

It is believed that the A-26 fire started at or near the carburetor inlet adapter due to failure or leakage of the main fuel-pressure line between the fuel pump and carburetor. Fire in this area would result in a rapid deterioration of the hose with a drop in fuel pressure which would be indicated on the pilot's instrument panel. The National Guard fighter caught fire, it was decided, as the result of an engine backfire igniting fuel which had leaked through faulty fittings or hoses.

As for procedure in operating the P-47 to avoid fire it has been recommended that pilots place mixture control in AUTO LEAN after landing and when taxiing. Maintenance personnel were instructed to remove cowlings and check all gas, oil and hydraulic line hose connections while UNDER PRESSURE during the engine runup.

Similarly, maintenance personnel of the A-26 outfit were instructed to perform inspections of the fuel lines with booster pumps ON in conjunction with preflight and daily inspections.

Airplanes returned to active duty from storage are particularly vulnerable to fuel line troubles, because of the ravages of time. The part may look okay on the surface, but when subjected to takeoff pressures a leak may occur, resulting in fire and disaster. Because fuel leaks so frequently result in disastrous fires, inspection personnel and pilots *must* guard carefully against this type of failure.

LETTERS TO THE EDITOR

Dear Sir:

The accident of the two B-29's (October—"Too Late for Prayers") was well described and the reasons given for the disaster are good, but emphasis is not given to the real cause and nothing is suggested as to what could be done to prevent a recurrence.

I say the real cause of the accident where two B-29's crash head-on in mid-air is simply because neither had passing lights. To mention any other factor as contributing to this accident is rather foolish, when anyone who has flown at night, in the dim dawn, at dusk, or during restricted visibility conditions, knows that a passing light, large, red, and glowing, is simply a *must*, if one expects to safely and intelligently carry out a flight.

The article points out to pilots that "Any deviation from established rules and regulations may well result in disaster." This, as a general rule, is certainly true, but a situation where the breach of regulation is so gross such as not requiring passing lights on airplanes that fly at night, is willful negligence and should read "gross deviation from established rules and regulations *will* definitely result in disaster."

I have met and instructed many pilots who were too at ease, complacent, and willing to yawn and say everything will be O.K., but even the most lackadaisical individuals have insisted that the passing light be turned on as soon as dusk approaches.

I'm all for pilots being made to fly altitudes odd and even conforming to the direction, but this alone will not keep aircraft from colliding as it isn't absolutely always possible to fly the prescribed altitude.

I recommend that all aircraft that have no passing lights be grounded for night flying until passing lights have been installed. These modifications can be made, simply by installing sealed-beam red lights in the nose.

JOSEPH L. CONCANNON,
Major, USAF,
Asst. S-3, Castle Field

• Glad to have your suggestions on the matter of B-29 passing lights. The situation is now under study and appropriate action can be expected.—Ed.

Dear Editor:

I would like to submit a "Storm Plan" as a postscript to General McDaniel's fine article, "Thunderstorm Technique" (October FLYING SAFETY).

A thunderstorm is not something which comes up without warning. It may develop rapidly, but a pilot knows when he is going to fly IFR, and can be ready with a storm plan well in advance.

A suggested storm plan would be to first have the crew secure all loose objects in the plane. Objects tossed around in the aircraft during extreme turbulence can be very destructive.

While the crew is doing this, the pilot should decide at what altitude he wants to fly through the storm and reach that altitude before entering the storm area. Airspeed should be reduced to 50% above stalling speed so that the stress and strain encountered in the storm will be minimized.

Concentrate on *NOT* over-controlling. Take the vertical currents in your stride—ride with them. Unusual attitude of the aircraft will result if violent correction is made for each up and down movement of the plane. If the aircraft is trimmed for normal flight, the balance of the updraft and downdraft will result in a near-normal attitude.

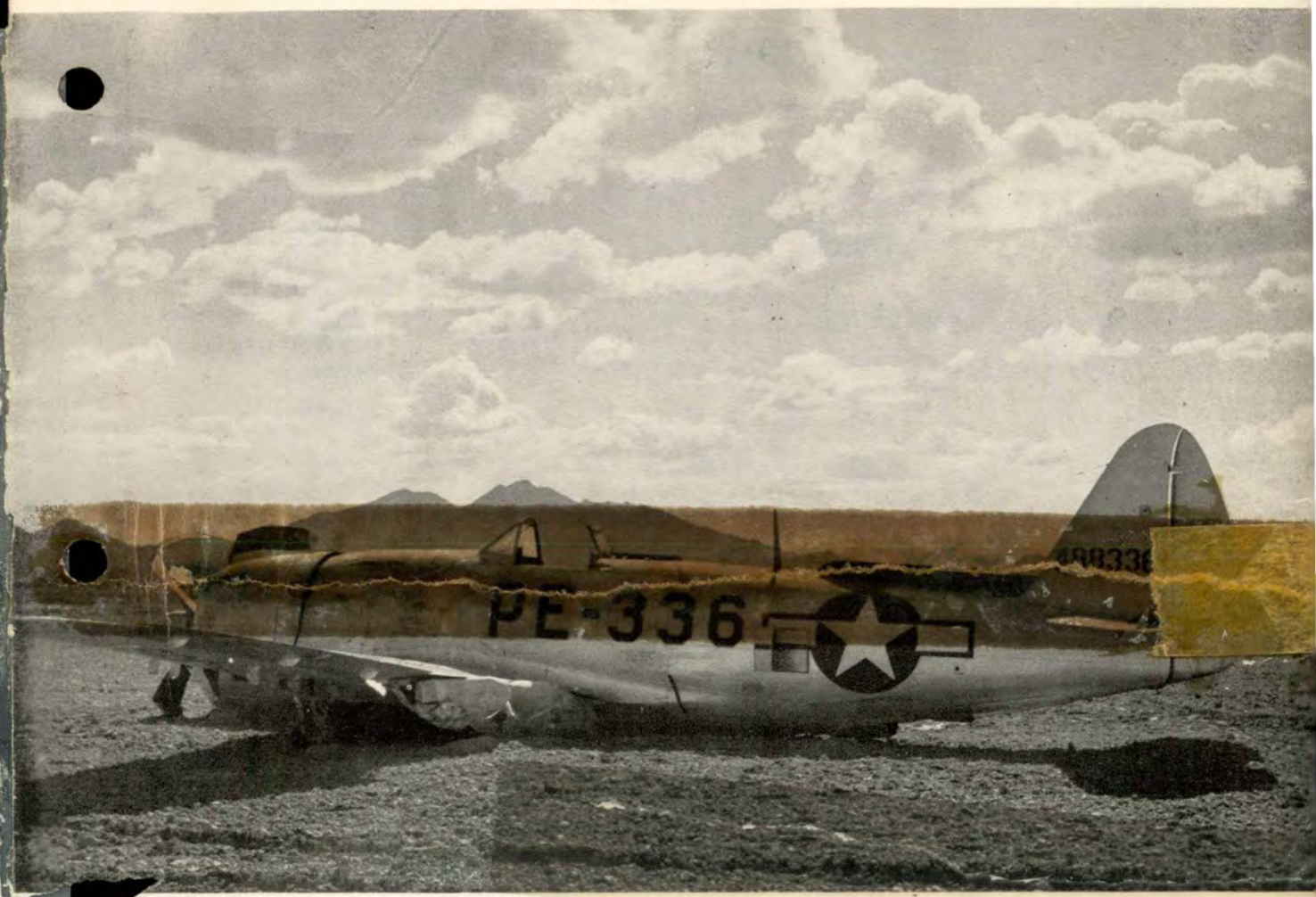
Maintain heading by "easy" control. Excess bank will cause the wing to stall out with loss of control.

After leaving the storm a check should be made to see that all controls function properly before attempting any maneuvers other than those necessary to regain normal flight attitude. The pilot and crew should check as much of the aircraft visually as is possible, including instruments, and reset those which may have been made inaccurate if the storm has been unusually turbulent.

After landing, a check should be made for loose or snapped rivets in the plane structure and covering. Finally, a check should be made of the rigging wires.

It has been my experience and that of pilots with whom I have "Hangar Flown" that if the pilot has a storm plan in mind and has taken precautions, even though thunderstorms continue to be a hazard they need not result in accidents.

S/SGT. ROBERT E. WOLF,
343 Reconnaissance Squadron,
VLR, Mapping,
MacDill Field, Florida



WHY?

FROM THE DAY his first instructor takes him out and says "this is an airplane," a pilot is drilled on the necessity for keeping track of his gasoline supply. One of the first lessons taught in primary, a lesson constantly reiterated throughout training, is to switch tanks immediately upon an indication of power failure.

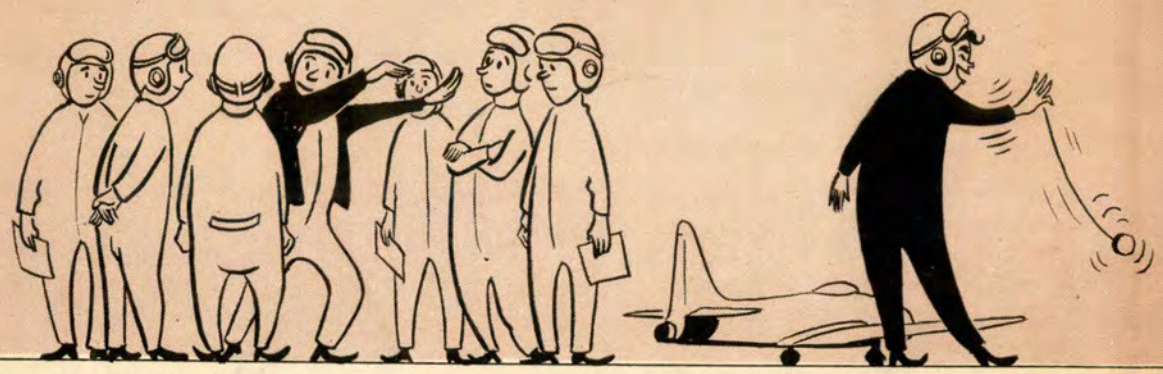
The advanced student pilot of the P-47 in this picture forgot all his training in rudimentary elements of flying. Returning from a formation flight, his engine started sputtering and losing power. He began working the boost control assuming that here was the trouble.

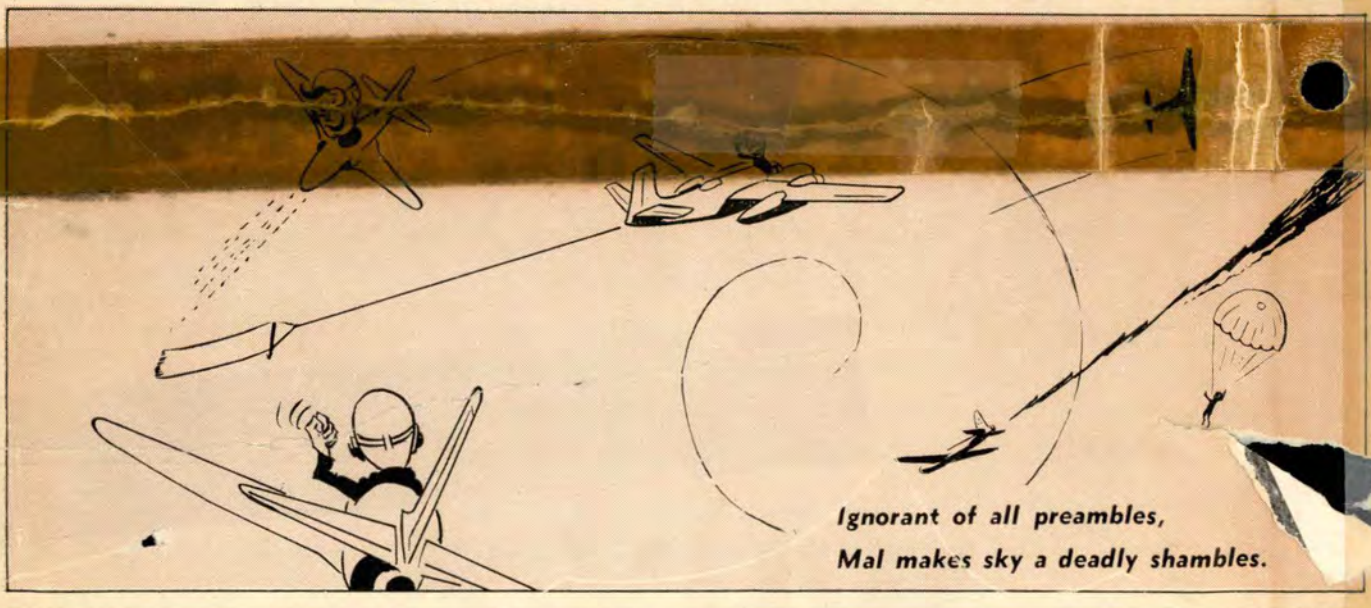
His flight leader, when informed of the difficulty, radioed him to check his gas selector, lock his shoulder harness and put down flaps for the landing.

The pilot did first things last. He jettisoned the canopy, put down flaps and then finally switched tanks. But he was too low by this time to give the engine time to catch again and landed wheels up.

Mal Function

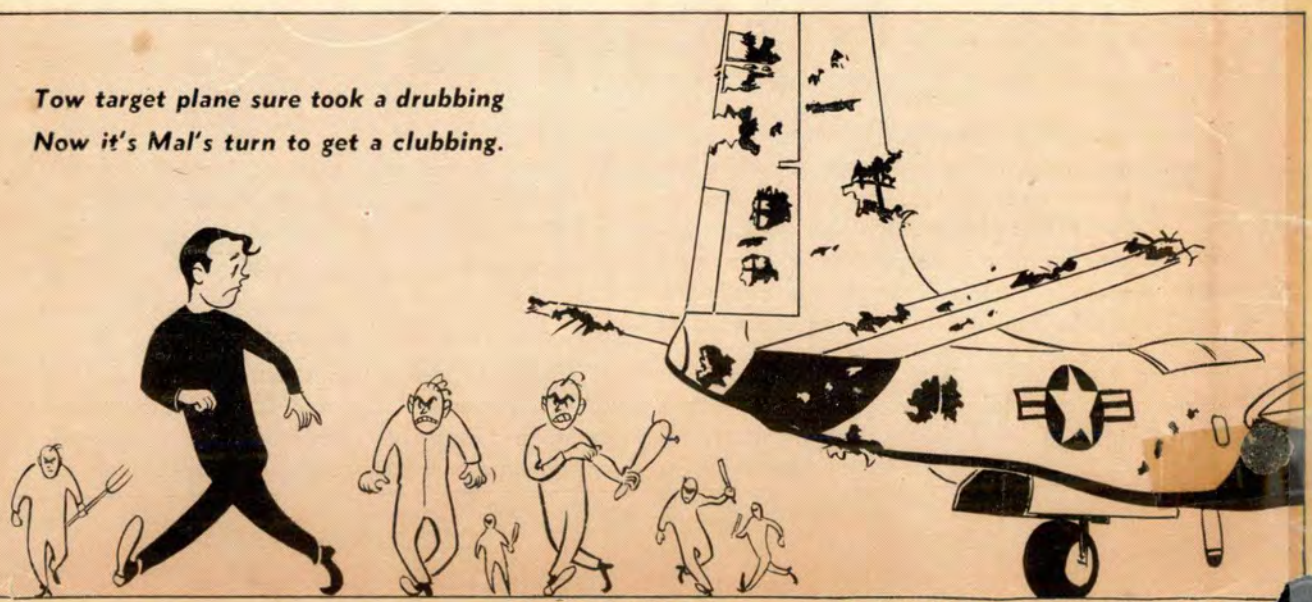
Gunnery briefing for the boys
While Mal is busy with his toys.





Ignorant of all preambles,
Mal makes sky a deadly shambles.

Tow target plane sure took a drubbing
Now it's Mal's turn to get a clubbing.



☆ U. S. GOVERNMENT PRINTING OFFICE: 1948—751950