Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED

JULY 1949

RESTRICTED

THE COVER PICTURE

After landing, the pilot of a B-29 was taxiing slowly behind the follow-me jeep through an area limited by a hangar on one side and a parked C-47 on the other. Observing the narrow clearance, the jeep operator parked the jeep out of the way and walked back to check the clearance of the B-29. He waved an emergency stop signal, but the pilot misinterpreted the signal to "come ahead." He proceeded a few feet when the left wing of the B-29 collided with the nose of the C-47. For more taxi accidents, see page 12.

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SHARE YOUR IDEAS

FLYING SAFETY Magazine welcomes comments, criticisms and editorial contributions from all members of the United States Air Force. Readers can help the magazine promote safe flight by offering information on procedures, equipment or training methods that have been effective in decreasing aircraft accidents. Address your letters direct to the Editor, FLYING SAFETY Magazine, Langley Air Force Base, Virginia.

FLYING SAFETY

DEPARTMENT OF THE AIR FORCE
The Inspector General, USAF, Office of The Air Inspector, Flying Safety Division, Langley Air Force Base, Virginia

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ARTICLES AND STORIES

FEATURES

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

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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.

EDITORIALS----THE DAILY PRESS

AS OTHERS SEE US

THE FOLLOWING ARTICLE, except for the deletion of specific names and places, was taken verbatim from the editorial column of a daily newspaper. Although it was written about the crash of a commercial airliner, it could have resulted just as easily from the crash of a military aircraft. Perhaps the most surprising thing about the article is the fact that the man who wrote it has ridden in an airplane only once in his life. It portrays keen understanding and sound judgment of the free American press (and consequently the American public) concerning a matter of prime importance to the Air Force—Flying Safety.

With renowned aeronautical experts stressing to the American public the importance of maintaining the United States Air Force as a striking force *second to none*, the American people are becoming more and more Air Force conscious. Thus, now as never before, the reputation of the Air Force must be kept clear of the cancerous stigma of inefficiency that a high rate of accidents might create.

The Civil Aeronautics Board has reached the conclusion, after investigating the fatal crash of a DC-3 plane, that ice and frost on the wings caused the tragedy; and that the pilot, who was among those killed, was responsible. This should not be interpreted by the public as any reflection on the skill of licensed pilots. And as a class we have an idea that they are about as careful a set of men as can be found. One would logically think so from the mere fact that if a plane suffers disaster it's the pilot's neck.

Yet the incident does serve once more to emphasize that the pilot is a major factor in safe flying and has to assume responsibility commensurate with his part in safety. It is not accidental—and it is salutary—that more and more attention has been focused by aviation authorities during the last few years on the pilot in investigating aviation accidents. And the fact that the pilot's own safety is integral with that of his ship and of those aboard is not of itself a warranty that he will always, unvaryingly, govern himself accordingly.

The plane, one of the safest and most dependable in commercial aviation (though some prominent lines are abandoning it in favor of larger, faster, and more powerful craft), had stood exposed on the field in a snowstorm. Ice had formed on the wings. Efforts to sweep and wash off the ice were only partly successful, and the pilot originally assigned to the flight refused to take it off the ground. A mechanic, according to his own testimony, then cleared the upper surface of the wings with an alcohol solution, but failed to treat or examine the under surfaces—where ice also had formed. The pilot, consulting another pilot, was advised that he ought to obtain "plenty of speed" before lifting the craft. This third pilot testified that he found not only ice on the underside, but rime and ice on top of the port wing with frost forming "rapidly" on both wings.

In spite of this condition; in spite of an excess of 1500 pounds above the legal takeoff weight; the pilot tried it.

The essential point in all this is that the pilot took a chance, when there was nothing like an emergency situation to justify it. He must have been fully aware of the difficulties any sort of ice accumulation on his plane would be certain to cause. Ice formation in flight has been one of the most difficult problems for the aeronautical engineer to solve, for two reasons—it adds to the weight of the craft and, even more important, it distorts the airfoil so that the lifting power is greatly diminished.

The human element cannot be eliminated from any form of transportation. All human beings are fallible. There always will be an occasional accident in any form of transportation ascribable to "pilot error" in some sense of the word.

In aviation, the problem just now is one which should be given special attention by the regulatory authorities not merely because of the immediate safety of an immediate operation, but because repetitions cannot but undermine public confidence in an almost incalculably useful service which despite its relative youth has established an enviable general safety index. At least as bad as the loss of lives in this particular accident is the unnecessary bad name it gave to an industry which, in the existing status of aircraft development and of electrical navigation aids, is essentially safe as well as serviceable.

B-29 STANDARDIZATION

During World War II the 306th Bomb Group was a B-17 outfit operating in Europe. Today the B-29 has replaced the B-17, and the group's primary mission is no longer dropping bombs but dropping hints to crews of the Strategic Air Command.

Down Tampa way the 306th Bomb Group (M) of the 307th Bomb Wing, 15th Air Force, under the command of Lt. Col. Loren Briggs, conducts the B-29 crew transition school of the Strategic Air Command.

The SAC B-29 transition school curriculum consists of four full weeks of flying and ground training. Ground school for airplane commanders and pilots covers in 80 hours the duties and responsibilities of airplane commanders, operation of the B-29, preflight instruction, weather and instrument procedures, B-29 emergency procedures, and weight and balance. The schooling for flight engineers includes preflight inspection, aircraft systems, engine conditioning, cruise control, and emergency procedures. Failure to maintain a grade of at least 70% in each subject covered results in the student's being eliminated.

Flight training is broken down into day and night transition, 25 hours; instrument training, 15 hours; formation flying, five hours; and flights above 30,000 feet, five hours.

The flying training is run off by the squadrons of the 306th. Ground training is conducted by a mobile training unit under 1st Lt. J. C. Collette. Ground school instructors are assigned to the M.T.U. by the CO of the bomb group. Incidentally, every pilot in the 306th, from the group commander on down to the adjutant, is a B-29 airplane commander. Capt. Harold F. Beery, a buck instructor in the 367th Squadron, has piled up a total of 3942 flying hours; Capt. Merle H. Henderson of the 368th Squadron is pushing 3500 hours, and Capt. George J. Mathis of the 369th Squadron is just a few hours behind him. That, you will have to admit, is a high level of instructor-pilot experience. These three pilots are the high men in the group, but most of the other instructors have logged a total in the neighborhood of 3000 hours of four-engine time.

Each squadron has eight instructor pilots who are thoroughly and periodically checked by a standardization board. All instructor-pilot personnel attend a weekly standardization meeting which cover the deficiencies noted by the standardization board during check flights. The stan board is made up of three members, headed by 1st Lt. Stanley M. Jones. They check the pilot, engineer and radio operator. The board literally rides herd on the instructor crews. Lt. Jones maintains an up-to-the-minute progress chart in his office on each student enrolled in the course. By reference to the chart, the stan board checks the crew in flight on the material covered in the preceding ground school session. On every flight, each student answers a 20-question quiz on the material covered the day before in ground school.

The flying time requirements for airplane commanders to attend this school are 750 hours total with at least 500 hours as copilot in the B-29, or 1000 hours total with 300 hours of four-engine as first pilot or 300 hours pilot or co-pilot in the B-29. When the crews arrive at MacDill they are not exactly strangers to the B-29, but when they leave they are strangers to the old way of doing things.

The flying phase of the school is obviously the most popular with the pilots. They fly on 10 days, five hours each day—a total of 50 hours. Ground school is conducted every other day, eight hours per day, for a total of 80 hours. Graduation exercises are conducted every three weeks. The quota of SAC students in each class is 60. There are 20 airplane commanders, 20 pilots and 20 engineers.

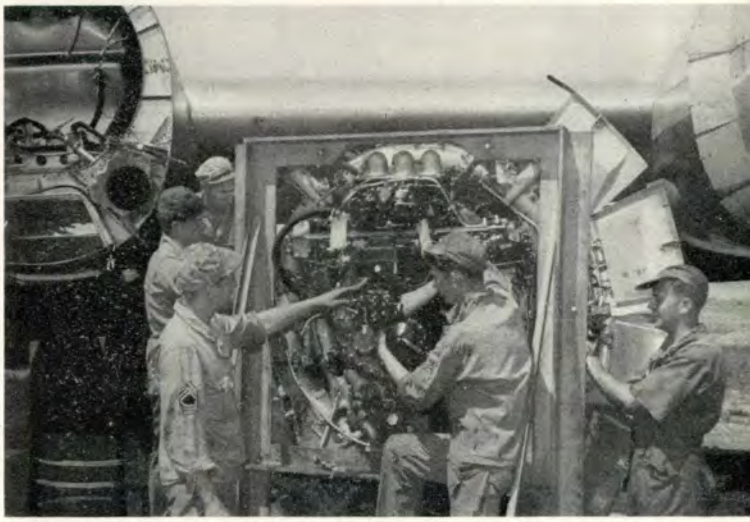
The student airplane commander gets the full flying treatment in 10 missions which are covered the previous day in ground school, with a briefing by the instructor pilot immediately before each takeoff. A mission folder is made up on each student pilot, and his progress is recorded by the instructor pilot after each mission. Any unsatisfactory grades are explained by the instructor in the remarks section of the page covering the particular phase of flying. This score card is filed in operations at the end of each flight. In this way, the grades are transcribed to the student progress chart.

On his first mission, the student pilot flies four hours of transition and an hour of instrument practice. Most of the students—and they all have beaucoup B-29 time—are impressed as the instructor pilot demonstrates the proper way to preflight, taxi, take off, and climb to altitude. At altitude, three types of stalls are demonstrated to the student. After an hour of instrument practice including straight and level flight, climbs, descents and turns, the instructor pilot demonstrates the proper procedure for traffic entry, normal approach and landing.

The second mission covers three hours of transition during which all emergency procedures are demonstrated to, and then practiced by the student. The remainder of this mission covers two hours of instrument instruction with the student making an instrument takeoff, a range letdown and low approach, and finally winding up the mission with a GCA approach.

His third mission covers instrument takeoffs, radio range orientation, range letdown and low approach, GCA approach and landing. During this mission he makes his first night takeoff at the school.

On the fourth mission the student really gets down to business. He learns how to handle an engine failure on takeoff, a runaway prop and turbo



supercharger, and makes a three-engine go-around. The mission is concluded with a two-hour instrument practice session which includes A pattern, B pattern, stall recovery, slow flying, and air work on two and three engines. As the student advances he spends more time on instrument training.

On his fifth flight the student pilot gets three hours of instrument flight and two hours of transition. During the instrument phase aural null, homing, and tracking are practiced. During the transition phase, maximum performance landings are stressed.

The student gets to fly four hours of formation on his sixth training flight. At least three airplanes are flown together on this mission. Individual takeoffs are made by the student pilots who assemble

away from the base, practice turns, then descend, peel off, and land.

The seventh flight is conducted at a minimum of 30,000 feet. B-29 emergency procedures are practiced at altitude, the airplane is depressurized and the descent made on oxygen.

During the eighth mission the crews sit back and watch a demonstration of air-to-air refueling.

The ninth or "last chance" mission consists of five solid hours of instrument practice. On this flight the pilot prepares himself for his instrument check.

The final flight is the pilot's green card check conducted according to AFR 60-4. The thoroughness of this check is proved by the fact that it takes five hours. If a student fails the check, he is not graduated from the school.

The student engineer learns to crank up the engines, taxi and make a complete preflight and engine run-up prior to takeoff. After the first mission, he rides the panel position in the B-29. During the 10 missions flown by him and the pilot, the engineer is given instruction on the proper emergency procedures for handling runaway props, turbos and generators.

On a typical training mission the student flight engineer performs a preflight inspection and, using the checklist, starts engines, checks the C-1 auto pilot, the oxygen system, and makes a complete check of the electrical and hydraulic systems of the airplane.

At the end of each class the 10 completed mission report sheets on each student are removed from the squadron file and placed in the student's transition training record. These records accompany each student back to his home station. To date, the 306th has graduated five classes of students.

In flying 2000 or more hours per month, the 306th has proved that standardized training pays off. Several two- and three-engine actual emergency landings have been made by student pilots while attending the school. One student airplane commander had a wing flap fail to extend while making an actual three-engine landing. Realizing what his trouble was, the student called for flaps up, made a no-flap landing and brought the B-29 to a halt using the emergency braking system. All this at night with no damage to the airplane.

The 10,000 accident-free hours flown by the 306th Bomb Group in carrying out its mission of showing others the right way stands out as an enviable record of peacetime training.

—Capt. John J. Herbert

WELL DONE

TO

CAPTAIN HARRY K. BLAKE AND CREW

Rhein/Main Air Force Base, Germany

A LOADED C-54 grossing approximately 70,000 pounds, night instrument flight conditions, icing, all instrument lights out, and the propellers missing from two engines—

This is the situation in which Captain Blake, along with 1st Lt. Julius B. Miller, copilot, and Sgt. George L. Fretwell, aerial engineer, found himself on the night of 13 March 1949, while en route from Rhein/Main AFB to Tempelhof AFB with a 10-ton load of coal.

Lieutenant Miller noticed a drop in oil quantity on the No. 1 engine gage. Sergeant Fretwell went to the rear of the airplane to check all engines but could observe nothing wrong. Returning to the cockpit the engineer inspected the No. 1 engine through the pilot's window, using the Aldis lamp. Oil was discovered leaking from the nose section. Oil was then transferred from the cabin tank to engine No. 1 to insure sufficient oil for feathering. Exact steps were taken to feather the prop.

In the meantime permission was obtained from Frankfurt airways to climb from 6500 feet to 7000 feet and return to Rhein/Main. Power was increased on the other three engines to 2300 rpm and 32 inches of manifold pressure. At this time the No. 1 oil quantity gage registered 10 gallons. The feathering button was pushed in but the rpm would not go below 1000. An additional 10 gallons of oil was then transferred to the No. 1 engine, and a second attempt was made to feather the prop. There was still no complete feathering action. Suddenly the prop started to run away but was brought under control by using the feathering button. The same thing happened a second time. The prop ran away a third time, and in less than five seconds there was a loud crash as the propeller came off engine No. 1 and crashed into engine No. 2, taking the No. 2 propeller off. At the time the two propellers were lost, all the plane's lights went out and the crew was forced to rely on flashlights on the return trip.

At this time the firewall shutoff valves were pulled and all switches to the two engines were turned off. Vacuum was switched to the No. 3 engine. An airspeed of 140 mph and a rate of descent of 300 to 400 feet per minute were maintained. At 5000 feet Captain Blake was able to maintain level flight. There was not sufficient time to jettison any of the cargo.

At 3000 feet and approximately 12 miles from Rhein/Main, contact flight conditions were possible. From this point on, a normal approach and landing were executed with no further damage to the airplane. Investigation revealed that the feathering motor on the No. 1 engine burned out from overspeeding due to lack of oil.

The calm and correct analysis of a difficult situation by this crew perhaps saved their lives and a much needed Vittles transport. Credit should also be given Frankfurt Airways for the expeditious clearing of the airplane back to Rhein/Main in spite of heavy Airlift traffic.

Well done, Captain Blake and Crew—

And another citation to a lowly flashlight.

How close can you get?

HOW CLOSE CAN YOU GET without crashing? Pilots making gunnery passes, firing rockets, and skip bombing seem to be trying to find out. Observations at a gunnery meet and studies of recent accidents revealed that, in an attempt to achieve a good score and to simulate actual combat conditions, most safety restrictions were forgotten or became amazingly flexible.

Out of 540 sorties flown in a recent gunnery meet, there were eight accidents — two fatalities, three majors, and five minors. Four airplanes hit skip bombing targets, three sustained ricochet hits during panel ground gunnery, and one flew into the ground during rocket firing. There were many other ricochet hits which did not cause sufficient damage to be classified as accidents.

Had it not been for the fairly soft terrain around the targets and the turf's ability to absorb bullets fired at a low angle, the number of ricochet hits would have been greater.

Materiel failure or design mistakes sometimes contribute to gunnery accidents. However, the lack of foul lines, minimum altitudes and minimum ranges for skip bombing, ground gunnery and rocket firing are usually the largest contributing factors. Also, in panel ground gunnery, the limited number of firing passes allowed (three for jet aircraft and four for conventional aircraft) necessitates long bursts and encourages firing to dangerously close ranges.

Consider this fatal accident which occurred recently. The pilot of an F-82 had made two previous rocket firing passes, pulling out at a safe altitude, and had fired one rocket. On his third pass at about 300 mph and a 40° angle of dive, the pilot did not begin his pullout until he was within 100 feet of the ground (15 times lower than the minimum safe altitude advised for starting pullout during the war). Needless to say, the airplane barely started to level out before it hit, disintegrated and burned. The point of initial impact was 229 feet beyond the center of the target. He did not fire a rocket on this pass.

There was no evidence of materiel failure although it was thought that there might have been a failure of the elevator boost system. But no elevator boost system can help you much in the last 100 feet at that airspeed and angle of dive.

Also, there might have been a failure of the rocket release mechanism, possibly explaining why this pilot stayed in his dive too long. However, he had made two previous runs and pulled out so he should have realized when he was getting too close to the ground. That is one of the reasons why it is always a good safe practice to make dry runs, establishing your pattern and watching the altimeter while looking around.

Cases have been reported in which targets have been blown over by blast or prop wash—too low, would you say?

The main guilt for such foolishness does not always lie with the pilots. Often supervisors haven't set up any real and definite safety restrictions. Also, limiting the number of passes in panel ground gunnery to the minimum makes for dangerous flying.

To illustrate further let's take the case of an F-51 pilot flying a ground gunnery mission. On his second rocket firing pass from a 2000-foot wing line pattern, he fired the number two rocket at approximately 1000 feet altitude and 1800 feet from the target. As the pilot pulled up and to the left, the spotter called in a direct hit on the target. At the same time, the pilot of the F-51 heard a thud and believed he had been hit by a ricocheting piece of rocket. He checked his airplane and returned to his home base for a normal landing.

Subsequent inspection revealed that a piece of rocket head, approximately two and one-half inches long and one inch wide, had entered the leading edge of the right wing root, causing major damage.

A 2000-foot wing line pattern was flown because there were clouds from 2500 feet up. The target was a dive bombing circular one with old steel tanks from gas trucks utilized as the bull's eye. Many boulders of all sizes and scrap metal from bombs and rockets were strewn over the target area.

The board reported the accident as being 50 per cent due to unavoidable collision with the ricocheting piece of rocket head and 50 per cent due to supervisory error.

Three months previous the board had made two recommendations as the result of a similar accident. They were:

a. That the rocket target be changed from steel tanks to a wooden pyramid.

b. That a 5000-foot wing line pattern be flown until a new target was available. It was also recommended that all boulders and scrap metal be removed from the target area, and thereafter the target be placed to keep it free from objects which might cause ricochets.

From past gunnery accidents and the results of gunnery meets, the following recommendations pertaining to flying safety have been generally agreed upon:

1. There should be a foul line for panel ground gunnery.

2. There should be more passes permitted in panel ground gunnery.

3. Butts should be used behind the targets in panel ground gunnery to stop ricochets.

4. There should be a foul line established for skip bombing.

5. The 2000-foot minimum release altitude for dive bombing should be retained and adhered to.

6. Concrete targets should not be used for skip bombing practice.

7. There should be a standard 750-foot tow cable for aerial gunnery.

8. Pilots should be allowed to familiarize themselves with ranges and procedures and make several dry runs before actual gunnery begins.

The recommendation made by one man illustrates how distorted a viewpoint one can get during competitive gunnery. This recommendation was that there be no foul lines established for any events, but that any pilot striking a target be disqualified. Chances are that *if* he struck the target he would be disqualified—permanently!

In panel ground gunnery at a range of 200 feet, a .50 caliber bullet will reach the target in .07 second. The airplane at 300 mph will cover the same distance in .45 second, or .38 second after the bullet hits, which is not sufficient time to avoid ricochets. Also, the airplane beginning a pullout at this short range is forced to pass over the top of the target at a low altitude, making it highly probable that ricochets, rocks or dirt will strike the airplane. From a range of 600 feet a bullet will reach the target in .22 second; the airplane will cover the same distance in 1.36 seconds, or 1.14 seconds after the bullet hits. This provides a much greater margin of safety to avoid ricochets and also permits the airplane to pass high enough over the target to avoid rocks and dirt.

It should be noted that the establishment of a foul line would require that pilots be allowed more passes to expend their ammunition since they will be able to stay in effective firing range for a shorter period of time. The construction of butts behind the targets would also reduce the number of ricochet hits but would not be as effective as the use of a foul line.

Foul lines can be used without detracting materially from the realism. Further, foul lines provide a better measure of accurate firing rather than of foolhardy determination. Practice in gunnery is designed to improve your skill and technique and *not* to show how brave you are.

STATIC

By The Flying Safety Committee
USAF Instrument Pilot School

When a pilot must depend upon low-frequency radio aids, his greatest hazard in flight is static. The inability to understand radio signals in a storm, combined with the psychological effect of being deprived of the only means of radio navigation, has given many a pilot a hard time.

The proper use of every available means to combat static, and the reliance upon several established methods of navigation when static is present should make instrument flying less hazardous for the pilot.

Basically, there are two types of static. One is caused by lightning and the other by precipitation. Lightning static produces sudden sharp crashes in the headset which, depending upon the rate of occurrence of the lightning discharges, distort the radio signals. However, under some conditions the rate of occurrences of these discharges is such that it does not affect the over-all reception. In other words, it may take a little time but the station identification signals as well as the quadrant signal can be identified.

Precipitation static begins when electrically charged forms of precipitation start striking an airplane and gradually builds up to a frying noise in the headset, as the intensity of the charges or precipitation increases, until the radio receiver is rendered useless. Precipitation static can be expected during flight through areas of rain, snow, ice crystals, or dust and may combine with lightning static to add the deafening clash of cymbals.

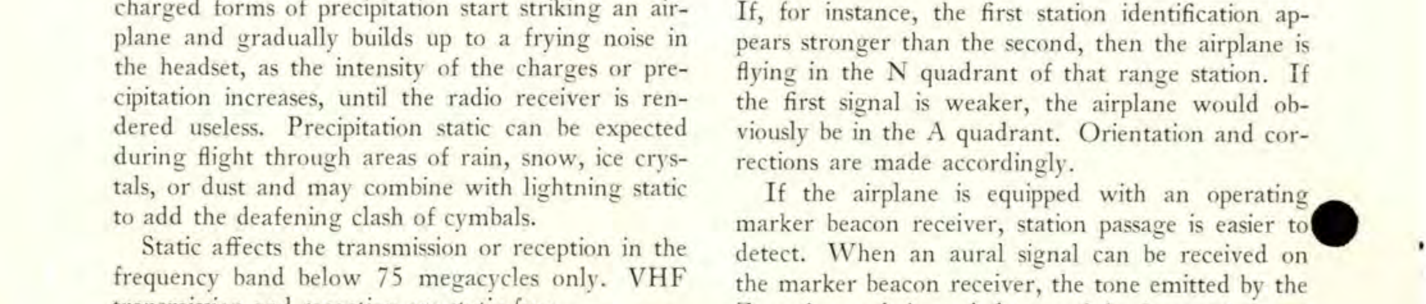
Static affects the transmission or reception in the frequency band below 75 megacycles only. VHF transmission and reception are static free.

When using low-frequency radio ranges for instrument navigation in regions where either lightning or precipitation static is present, there is a definite procedure that will materially improve the reception on low-frequency receivers. First, tune the receiver in the normal manner and check for positive station identification. Even if it is impossible to distinguish between the A and the N, listen for the station identification signal. It is normally received with greater clarity than the quadrant or the on-course signal. Keep the volume at a comfortable level at all times. If you increase the volume in an attempt to identify the signals, you will merely increase the over-all volume, static and all.

When very close to a radio range station, it is easier to distinguish the quadrant signals in moderate static. The farther the airplane is from the station, the less satisfactory the signal received.

Remember one point. The first station identification signal is broadcast from the N towers, while the second is from the A towers. Thus, since the station identification signal can be identified, the pilot can determine his approximate position by checking the volume on the A or N transmission. If, for instance, the first station identification appears stronger than the second, then the airplane is flying in the N quadrant of that range station. If the first signal is weaker, the airplane would obviously be in the A quadrant. Orientation and corrections are made accordingly.

If the airplane is equipped with an operating marker beacon receiver, station passage is easier to detect. When an aural signal can be received on the marker beacon receiver, the tone emitted by the Z marker and the coded tone of the fan marker can



be relied upon at all times. During station passage, even in heaviest precipitation and lightning static, the high-pitched tone of the Z marker can be distinguished as the station is approached and passed.

The importance of dead reckoning as an aid in flying through areas of static cannot be stressed enough. After a range station is passed, holding the published beam heading until the next range station signals are readable will prevent undue wandering during the no-signal period. A close check on the time between range stations will give an accurate ground speed, which is helpful in estimating the time over the next radio fix.

As an airplane flies through a charged portion of a cloud it picks up an electrical charge. When this voltage exceeds the value that can be contained by the airplane, the charge leaks off into the surrounding atmosphere. This pyrotechnic display is called St. Elmo's Fire. The brilliance of this blue-yellow light is sometimes so great that the cockpit is illuminated and unless his attention is centered on the flight instruments, the pilot may be blinded temporarily. Aside from the psychological and glare effect, St. Elmo's Fire is not a hazard to flight.

The most effective way to combat static in the low-frequency range is by using the shielded loop antenna. When this loop is used for range reception, the techniques employed are the same as those used with the conventional receiver. Station passage is more easily detected using the loop than the conventional receiver. The volume should be kept low as the station is approached, and when the airplane is directly over or to one side of the station, if the plane of the loop is at right angles to the station, a null is received. In the event that station passage is uncertain, a turn of 15° to the right is made for a quadrant signal check.

The automatic radio compass is more reliable in precipitation static than in areas of lightning static. A radio bearing should not be relied upon without first checking its authenticity by aural null procedures.

The VHF homing adapter which is installed in some Air Force planes enables the pilot to home on any VHF radio signal transmitted within the frequency range of 120 to 140 mc. While this adapter is designed primarily to afford a means of homing on a control tower or another airplane, in an emergency it can be used to make a letdown.

The advent of VHF radio equipment has eliminated the hazard of a letdown in conditions of static. If there is a GCA unit at the destination, the only necessary radio equipment is a VHF communication receiver and transmitter.

In conclusion, the following standard procedures should be followed:

If the pilot is unable to maintain two-way radio communication because of static or radio failure, he will observe one of the following procedures in this order:

1. If weather conditions permit, proceed in accordance with VFR.

2. Proceed according to current flight plan maintaining the minimum safe altitude or the last acknowledged assigned altitude, whichever is higher, to the airport of intended landing. Commence descent on the last acknowledged expected approach time, or if such a time was not received, make the letdown at the destination on the expiration of the estimated time of arrival.

3. Follow such other emergency procedures as may be appropriate under the conditions.

Turnabout is FOUL PLAY

FOR MANY LONG YEARS our feathered friends, the birds, sat complacently on the sidelines and watched numerous human attempts to fill their winged shoes. They never became too worried about it. After observing many failures the birds must have concluded that we ape-like mortals couldn't turn the trick. They even lost interest in watching and went winging on their way, oblivious of the fear of competition. Did they get fooled!

In 1907 the Wright boys filled an inside straight and finally made the grade. They made like the birds. Now this momentous occasion caused no little furor in the bird kingdom. It seemed that regardless of whether the birds wanted it or not, they were about to get a mechanical brother. However, for quite a few years the future of aviation seemed an insecure thing and once again the birds decided to settle back and watch their competition go to the dogs.

When the lid blew off World War II and aviation came of age, many a bird must have turned a grey feather. Or at least it seems that way. Their whole attitude changed. They set out to liquidate competition. They started ramming holes in wings, splattering themselves on windshields, jamming carburetor intakes, and numerous other offensive measures.

After all of man's struggles to conquer the birds' secret of flight, it seems rather like a quirk of nature that he should have to conquer the bird also. It may be that this is the reason that regardless of the serious nature of this bird vs. plane competition, it assumes a humorous aspect to many people. However, when our feathered friends' attachment to their mechanical relatives starts costing lives and aircraft it's no longer a joking matter. Something has to be done about it.

One of the first major bird problems to confront accelerated Air Force operations arose at Ascension Island early in the war. Flocks of sooty terns had used the island for their "fair" or nesting place for many, many years and the fact that one end of the newly-constructed ATC runway was adjacent to their haven didn't please them at all. In fact, the birds became quite bitter and did their best to hinder flying activities. After all they hadn't invited their metal in-laws to move in and the birds felt quite justified in exercising squatters' rights. The Air Force, however, didn't agree with the birds' attitude.

Consequently, the new self-installed landlords started seeking a means of evicting their unwelcome feathered tenants. They tried buzz jobs, smoke candles, and even resorted to the old Chicago gangster technique of dynamiting the opposition. One resourceful officer also tried firing Very pistol flares at the birds. All of this effort was of no avail against the stubborn terns. Although the Very technique was partially successful in that it cleared the runway for short periods of time, it did not have a lasting effect. At their wits' end, the harassed officials decided to call in a bird expert.

After much experiment and study the expert concluded that the easiest way to persuade the birds to move was to take away their eggs. He further suggested that the nesting places be covered with wire to keep the egg-layers out. Faced with such a lock-out, the majority of terns became disgusted and, realizing they weren't wanted, moved on and left the runways to their mechanical counterparts.

Granted that this should prove effective in arctic or tropical zones where breeding areas are a menace to operations, it will have little effect and is also impractical around bases where flocks of birds move in for just a few days or a week's stay before moving on. However, these "transient flocks" can prove just as much a flight hazard as the aforementioned terns and it is obvious that some method must be devised to discourage their appearance in traffic patterns.

One continental base was confronted with just such a transient flock problem early this year. The result was costly. A flock of approximately 600 starlings took to the wing in front of a paratrooper-filled C-82 that had just taken off. Too close and low for evasive maneuvering, the "Boxcar" struck the center of the flock. Four lives were lost in the resultant crash.

In an effort to dispel the birds in the area, two jeeps, each with a team of three men armed with shotguns, were used to pursue the birds around the field area. The birds played it cool, though, and wouldn't let the "hunters" get close enough to do extensive damage. As a result only about 75 birds out of the flock were killed. However, after approximately four days of such activity the birds either dispersed or left the area. Despite the fact that the birds left after the shotgun treatment the official report of the matter states that, "Whether this was due to the number shot, the semi-continuous pursuit, or a change of season or habit, is not definitely known." This statement leaves us with the question as to whether the shotgun treatment would or would not always work against the transient flock.

The problem of the transient flock is not peculiar to the Air Force. Perhaps we can look elsewhere for help.

Many cast-in-bronze public figures such as General Grant, Abe Lincoln, and Chief Justice Taney; numerous car owners; and just plain citizen John Doe without a hat will attest to the dangers of the transient flock.

Sometimes enraged citizens rush for the City Hall, attired in polka dot ensembles. The city fathers are called into council.

The local gendarmes are dispatched with their shootin' irons to rout the birds. A few birds are killed and occasionally a group will move over to the next park. But as a whole the gunning method proves unsatisfactory. The birds leave when they get good and ready.

Many methods are then tried by the residents. They dispatch their youngest with pans and spoons, cap pistols, firecrackers, and what have you. None of these have lasting effects.

Of course the trouble that confronts the local politicos isn't of the same nature as that which confronts the Air Force. However, the final question is the same—how to get rid of the birds?

One small town in the Middle West had a day of reckoning. A local Edison offered the advice that most small migratory birds were allergic to owls. With the use of some old scrap metal and paint, some dummy metal owls were constructed. Luminous paint was used around the edges and on the eyes. These dummies were then placed in the trees where the birds nested. No more birds. When the owls moved in, the birds moved out.

It would be quite impractical to attach dummy owls to airplanes. But there is the possibility that placing the dummies in trees and bushes around the airstrip would keep the local pattern clear. This is only speculation, of course, as experiments with this method have not been tried.

Certain birds are attracted by garbage dumps. Removing such feeding spots from the local traffic pattern has been known to make approaches and takeoffs safer.

The British have attacked the problem in a literally natural way. A bird for a bird. They've trained falcons and have used them at some of their fields with considerable success. However, no MOS for Falcon Expert is listed in the AF personnel manual.

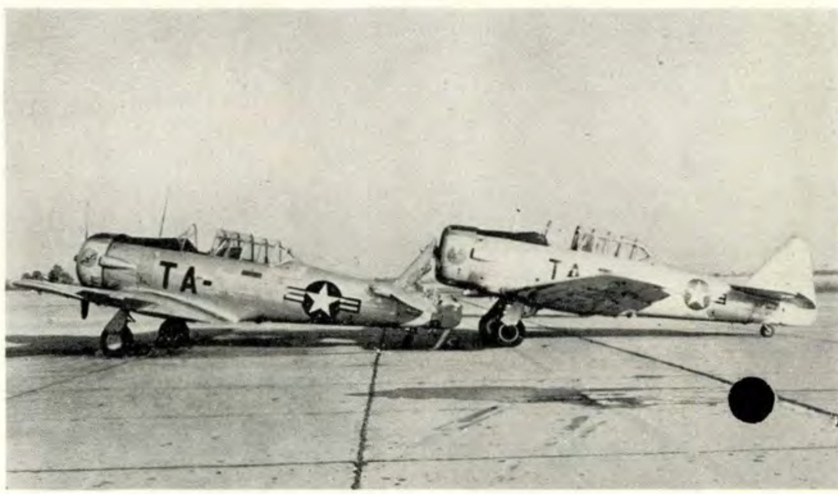
Besides the breeding and transient flocks there remains the single bird that comes winging in from two o'clock when you least expect him. Research on combating this type is very meager. About all that can be said is give him a wide berth if you see him in time.

It has been observed by some pilots that soaring birds such as hawks and eagles will fold their wings and dive when meeting an airplane. Flapping-wing birds are less steady—may turn, climb or dive. Close in, you can't outmaneuver a bird.

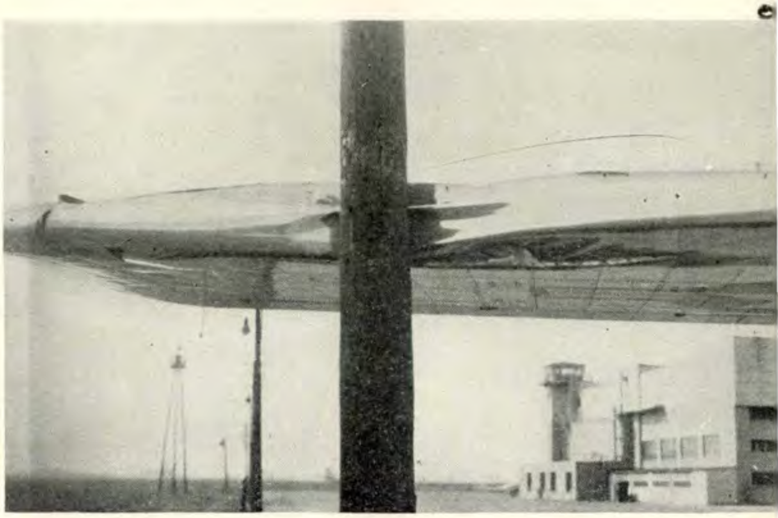
In summing up there still appears to be no definite solution to the bird problem. Despite all human efforts it still remains a serious menace. All we can do is hope that the Great Bird Father will publish a regulation outlawing the "jay-fliers" from the airways.—SGT. E. P. MAGAHA.

Fast taxiing is as dangerous as fast driving—more so in airplanes without nosewheels because of the poor visibility afforded from the cockpits. Single-engined airplanes with conventional gear are often taxied into other aircraft and vehicles when the man at the controls fails to make "S" turns. Faded guide lines or worn out stripes on taxiways and parking ramps also make safe taxiing difficult.

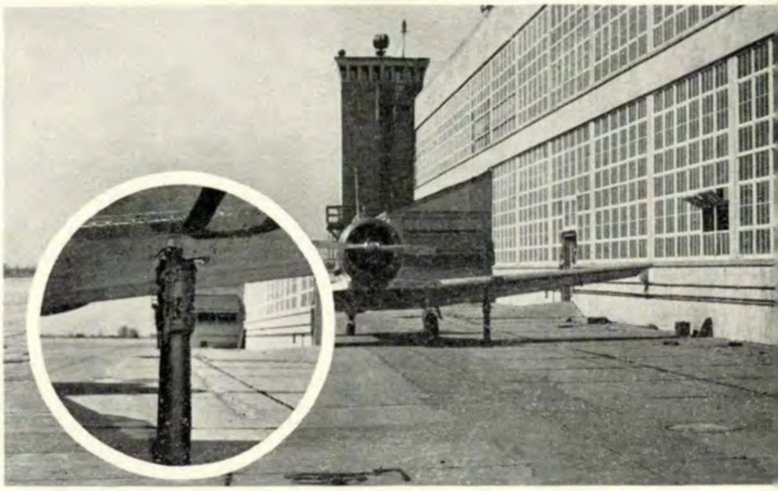
As the sign says, TAXI WITH CAUTION. The cause of practically all taxi accidents is carelessness. One out of every six Air Force aircraft accidents is caused while taxiing. Millions of dollars in costly airplanes and ground equipment are lost every year as a result of taxi accidents. The errors which allow planes to roll into obstructions can be corrected, whether they are failures of the men at the controls to see where they are going, or failures of the braking systems because of poor maintenance.

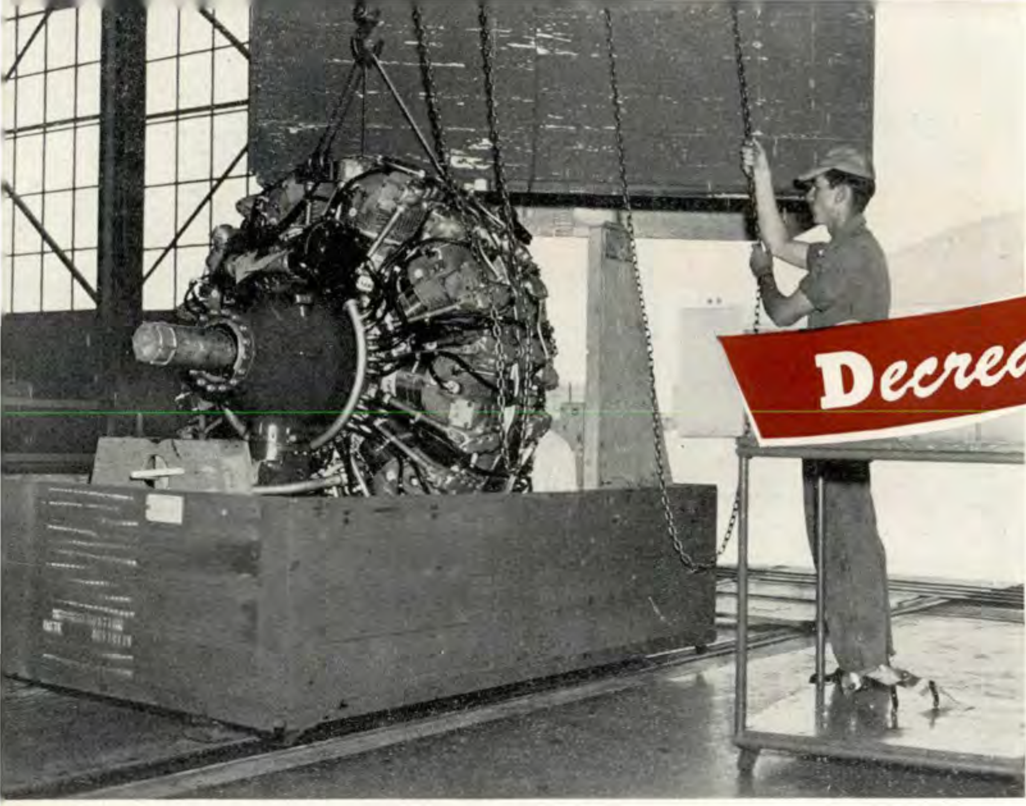


Taxiing of aircraft by personnel not qualified to do so leads to many accidents. Before a man is allowed to taxi a plane he should be given a thorough checkout, and it should be determined that his vision and depth perception are not faulty. Failure to use wheel chocks when starting aircraft engines is another major cause of accidents. Improper hand signals by alert crewmen can lead to confusion and damaged planes.



Improper or inadequate marking of obstructions and equipment is as great a hazard to safe taxiing as insufficient clearance in parking areas and along taxi lanes. Leaving equipment such as crew chiefs' stands, fire extinguishers, auxiliary power units and tractors on ramps where airplanes must taxi is carrying carelessness to the extreme. Remember, an airplane needs more than the width between its wheels to taxi safely.





SINCE THE WAR, Engine Conditioning has become a real, live article. The percentage of grounded airplanes is being cut to almost zero in many units.

The 509th Bomb Wing, Walker Air Force Base, New Mexico, commanded by Col. C. S. Irvine, set an enviable record recently when it sent a squadron of B-29's to England. Flight time was approximately 28 hours, and within 24 hours after arrival in England this squadron had 100 per cent of its B-29's in commission.

This success was attributed to outstanding maintenance, conditioning of the engines, proper treatment by the flight crews, and the application of the basic principles of engine conditioning to the electronic equipment.

First of all, it took quite a bit of planning and work to get almost 100 per cent availability. Supplementing the pertinent USAF technical orders, the Strategic Air Command has published SAC Reg. 66-8, popularly referred to by the boys in the 509th as the SAC bible.

The purpose of this command regulation was to prescribe procedures, not included in existing publications, which service experience has proved mandatory in conditioning, maintaining, and operating R-3350 engines, to obtain maximum efficiency and trouble-free service. The responsibility for compliance with the SAC Reg. was placed on all commanders and operations and maintenance personnel of all echelons.

Charged with this responsibility the personnel of the 509th started to work. An experienced engineering officer picked two of the best trained ground crew chiefs from each of the bomb squadrons. These men went through a detailed engine conditioning course. A B-29 was set aside especially for this school. Troubles were put into the engines and the crew chiefs had to find them. After graduation these men went back to their respective squadrons to teach other crew chiefs.

When new or overhauled engines were received from the depot, maintenance personnel started to work on them on the engine build-up line. A detailed check was made of each engine before it was sent to a squadron. An initial ground run followed by minor adjustments assured that the engine was perfect.

Newly received B-29's were given an acceptance inspection, basic weight and balance check, and the instrument calibration which is given all of the airplanes. This includes calibration of tachometers, manifold pressure gages, fuel tank liquidometers, oil tank liquidometers, torque meters, fuel flow meters, and airspeed indicators. Compasses were swung, and fluxgate compasses and altimeters checked.

intenance Load

All of these instruments were calibrated within *one per cent.* Calibration cards were made up for flight engineers, and applicable calibration charts were made available at all stations. The value of this calibration in long-range missions using maximum cruise control can be seen readily.

Now the question may arise as to "who calibrates the calibrators?" The test equipment was airlifted to the air depot for calibration, thus insuring the accuracy of all instruments.

The 509th makes two basic checks of its airplanes. The first is the preflight check which includes an ignition system check, cruising mixture check, power check (no boost and with boost), and inverter check. The information thus obtained from the preflight is posted on the flight crew cockpit check form and is used by both the flight crew and ground crew chief. Ground runup of R-3350 engines installed in B-29 aircraft is held to the minimum for all the checks because of the marginal cooling characteristics of the nacelle configuration. It is important to make sure the airplane is faced into the wind for these checks.

The second basic check is the postflight check and it is mainly for the benefit of the ground crew chief. It gives him the story of what the flight took out of the engines so that he can intelligently troubleshoot from the information on the postflight check form.

The flight engineer is responsible for both preflight and postflight checks. One objection to these checks is the amount of ground time imposed on the engines. However, the advantages far outweigh this disadvantage.

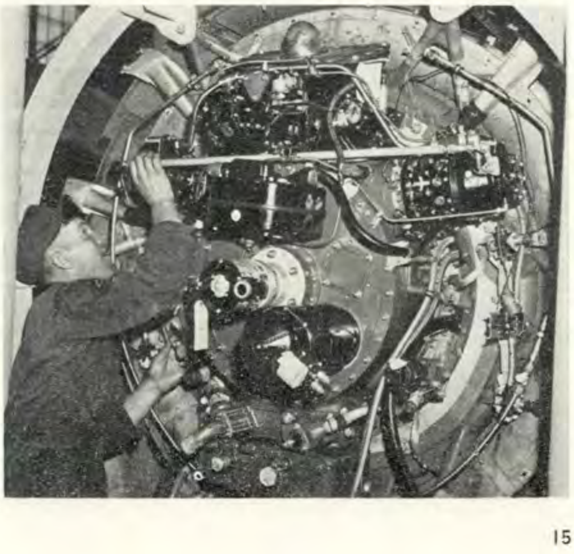
When major work has been performed on an engine or a new engine has been installed, a thorough check is made of the engine before the preflight. This includes magneto switch check for grounding, magneto check, power check (no boost), idle mixture check, cruising mixture check, acceleration and deceleration, and power check (with normal boost). Results are posted on the engine conditioning analysis form.

In the checks and subsequent troubleshooting it has been found that ignition and injection troubles are closely allied. A cold cylinder could result from faulty ignition or fuel injection, so each must be checked in turn to locate and eliminate the trouble.

The ground chiefs of the 509th Bomb Group are the boys who carry the ball. However, the flight engineer plays an important role in that he must give them the accurate information. All of the forms mentioned are filed and used for troubleshooting by the ground crew chiefs.

As evidenced by the B-29 Green Flying Safety Pennant awarded the 509th Bomb Group, its safety record is good. For this, the engine conditioning program is given much credit.

Checking proper synchronization of injection pumps.

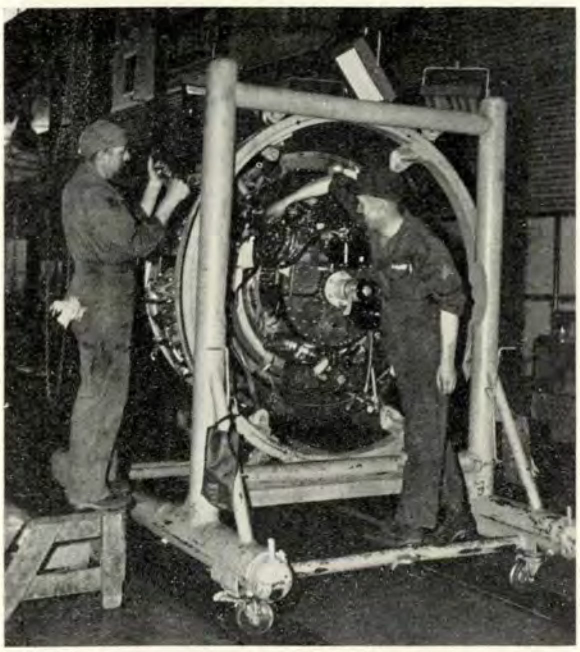


Only two accidents have been due to engine failure since this program began. One started with an engine fire and resulted in crew bailout. The second one occurred when the pilot lost an engine and overshot on landing.

As Capt. Max Gillaspy of Wing S-4 says, "As mechanics become more conscious of engine conditioning and more familiar with the checks, they are constantly striving for perfection. And the maintenance load decreases after the engine conditioning program is in full swing."

Making adjustments on engine after post-flight check.

Installing fuel injection pump.



Electronics comes in for its share of conditioning also. This started when the CO walked into the electronics shop and picked up a transmitter selsyn which had caused an inflight failure. He asked, "How much time is there on this selsyn?" The answer was, "I don't know, sir!" Thus began the operational maintenance log of all electronic equipment.

As the CO put it, "We are just applying time-worn maintenance methods to the field of electronic maintenance."

A radar maintenance bulletin is published regularly which gives the corrective methods for current troubles. Before, radar antennas had been left on airplanes until they fell off. As much as one-fourth inch wear was found on armatures of drive motors. There is great possibility of shorting out and fire when such conditions exist.

Now a 300-hour inspection procedure is in effect for such equipment, and even antennas are removed from the airplanes at this time. There are 25- and 100-hour inspections as well as preflight and daily inspections. Yes, proper preventive maintenance is the order of the day—each day!

Proof of the success in this field is shown on the percentage-of-successful-missions graph. In March 1948, there were 80 to 90 per cent of the missions going all right with no abortions due to radar failure. February 1949 was the first month that any squadron of this group hit 100 per cent with *no* inflight failures of radar equipment.

The men of the 509th are proud of their record and really work to maintain it. It is not uncommon to see flight crew members going over their B-29 two hours before takeoff. They have had few engine fires, and a big part of this engine fire prevention is the way the flight crews perform the fuel system pressure check. After performing this check as specified in the SAC bible, the flight crew removes the cowling and checks for green stains or any indication of a fuel leak.

Yes, all of this takes time but it pays off in dollars and human lives, plus successful missions.

With such conscientious effort being exerted by all, from CO down to the on-the-job trainee, the future success and higher achievements of the 509th are assured.

—1st Lt. Rodger W. Little

RESCUE BY 'COPTER BLAST

Capt. and Mrs. Edward H. Connor of Wheeler Air Force Base had been swimming at Kawailoa Beach, about 18 miles from Hickam Air Force Base, when they were caught in a strong and tricky offshore current. They were both holding on to an inner tube when the current started carrying them out to sea. About 250 yards from shore, the swimmers managed to cling to a submerged reef.

Meanwhile, a beach resident sized up the situation and called the Hawaiian Sea Frontier for help. A crash boat was dispatched, but couldn't get near the stranded swimmers because of the reef. Another swimmer attempted to reach the captain and his wife, but was himself caught by the current and carried out to sea. The crash boat, which was waiting just beyond the reef, rescued him.

When the 6519th Air Rescue and Boat Unit at Hickam AFB was alerted, Maj. Victor B. Billinghurst, commanding officer, sent out 1st Lt. Melvin Ayau in an HG-5 helicopter. Lieutenant Ayau has been in rescue work for several years and is well acquainted with the versatility of the helicopter. Within a few minutes, the HG-5 was over the stranded swimmers and Lieutenant Ayau dropped them a life raft.

The swimmers got into the raft, but Lieutenant Ayau realized the job was still far from being completed. Considering the waves, wind, the reef and the current, he felt it too risky to allow the raft to drift out to sea where crash boats were waiting beyond the reefs. Noting the ground cushion effect created by the helicopter blades on the water, Lieutenant Ayau decided to use the rotor blast as a means of propelling the raft. He then maneuvered his helicopter to the seaward side of the raft and approached it with caution. The spreading effect of the ground cushion pushed the raft across the water, and Lieutenant Ayau found he was able to control the drift of the raft with remarkable accuracy. The procedure was continued until the swimmers stepped out of the raft onto the sand beach.

Lieutenant Ayau then returned to Hickam AFB and landed one hour after takeoff.

The resourcefulness of the pilot in analyzing the problem and developing a solution on the spot was a major factor in the success of the mission. Lieutenant Ayau's skill in handling his helicopter and utilizing what is normally regarded as lost energy was commendable. Lieutenant Ayau has contributed another idea to the use of the helicopter which may be well worth copying in similar situations. The procedure could be used to blow a raft or boat to survivors who might otherwise be unable to reach it.

TIGHT SQUEEZE

BEFORE YOU read this story, pause for a moment and think back over your flying career. Have you ever made a letdown through a hole in the clouds when you realized full well that it was not in accordance with VFR . . . but you figured there was plenty of room for everybody, and after all, you were just going to duck through?

If you have, then read on.

This is the story of an F-80 pilot who made such a letdown with a wingman. Just about the time the two F-80's had broken contact, the wingman called for a break. It seems that a B-29 got caught in the corner of his eye.

The wingman estimated that he missed the B-29 by 20 feet, but the leader parked his vertical stabilizer and rudder in one of the B-29 engine nacelles. The B-29 had been on a practice photo run at an indicated altitude of 3700 feet. The base of the cloud was estimated at 4500.

Immediately after the accident, the F-80 pilot returned to his base for an attempted landing with his wingman making the radio calls. No rudder, no antenna—no antenna, no radio. At low speeds with the gear and flaps down, the F-80 pilot found it impossible to maintain lateral control, so he climbed to 2000 feet and then let down VFR a la nylon.

Damage to the B-29 was not too extensive. However, the wing flaps would not lower beyond five degrees because the F-80 rudder had struck the flap drive shaft.

The pilot who bailed out estimated the size of the hole in which he let down to be about 1000 feet long and anywhere from 600 to 700 feet wide. The wingman in his statement said that his estimate of the size of the hole was eight to 10 plane lengths long and five to six plane lengths wide. Someone had best be taking a depth perception check.

At 300 mph, letdown through a hole in the clouds which will not afford sufficient forward visibility to maneuver away from an oncoming airplane flying 500 feet below the overcast is virtually suicide. You don't just duck through at that speed —you dive through. It is far wiser to obtain clearance to descend through the clouds at a more shallow angle than to try to dive through when conditions are such that the letdown cannot be made under VFR.

Your chances of furthering your career in the Air Force are slim when you pull a stunt like that. Know why? You've got to be around to further it!

PENNANT WINNERS

Period: January through March 1949

BLUE PENNANT WINNERS:

- *B-25, Mather AFB, Calif., AFTRC
- *C-45 (T-11, T-7), Hamilton AFB, Calif., ConAC
- C-47 (C-53), Wright-Patterson AFB, Ohio, AMC
- C-54, Westover AFB, Mass., MATS
- F-51, Pope AFB, N. C., ConAC
- F-80, March AFB, Calif., ConAC
- T-6, Perrin AFB, Texas, AFTRC
- Misc., Westover AFB, Mass., MATS

GREEN PENNANT WINNERS:

- B-17, Eglin AFB, Fla., APG
- B-25, Maxwell AFB, Ala., AU
- B-26, Langley AFB, Va., ConAC
- *B-29, Walker AFB, N. M., SAC
- C-45 (T-11, T-7), Selfridge AFB, Mich., ConAC
- C-47 (C-53), Brookley AFB, Ala., AMC
- C-54, Fairfield-Suisun AFB, Calif., MATS
- F-51, Turner AFB, Ga., ConAC
- F-80, Wright-Patterson AFB, Ohio, AMC
- T-6, Davis-Monthan AFB, Ariz., SAC
- Misc., Turner AFB, Ga., ConAC

WHITE PENNANT WINNERS:

- B-17, Griffiss AFB, N. Y., AMC
- B-25, Offutt AFB, Neb., SAC
- **B-26, McClellan AFB, Calif., AMC
- B-29, Kirtland AFB, N. M., AMC
- C-45 (T-11, T-7), Cleveland Mun. Airport, Ohio, AMC
- C-46, Marietta AFB, Ga., ConAC
- C-47 (C-53), Williams AFB, Ariz., AFTRC
- L-5, Randolph AFB, Texas, AFTRC
- F-47, Mitchel AFB, N. Y., ConAC
- F-51, Eglin AFB, Fla., APG
- T-6, Lockbourne AFB, Ohio, ConAC
- Misc., Washington National Airport, D. C., MATS

*Denotes two-time winner consecutively.

**Denotes three-time winner consecutively.

SAFETY SAGAS

Instrument training was a big lark
to a stoop named Andrew McSnark

Until one day he got caught in the murk
and regretted his play instead of work.

Andrew hit the sod at six hundred per,
brains and gyros caged . . . as it were.

Violation!

(Unauthorized Taxiing)

Taxi accidents involving violations of AF regulations are inexcusable, but quite numerous. In the first three months of 1949 approximately 25 taxi accidents due to violations were confirmed.

In one case, an airman who was not fully checked out on taxiing started a T-6D and taxied into a parked TF-51, resulting in major damage to both airplanes. He had called the tower for permission to taxi out to runup position for a preflight and daily inspection. Another airman served as his fire guard and wingwalker until he thought the T-6 was safely past the TF-51.

The airman was taxiing north with a wind from the west at approximately 25 mph. He had left the tailwheel unlocked and had set the throttle for 900 rpm. Suddenly, as he started a turn to the left, a gust of wind hit the T-6 and it swerved out of control into the parked TF-51.

Evidence (photographs of T-6 tailwheel and damage to TF-51 wing) indicated that the airman hit the left rudder and brake first, causing the T-6 to turn sharply to the left as the collision occurred. The prop of the T-6 cut into the outboard bay of the right wing of the TF-51.

The airman was unaware afterwards of any action he took to avoid the collision other than stopping the T-6. In the interrogation the airman was questioned as to which rudder he would push if he wanted to go to the left. He answered "left" and went on to explain that if he hit the left rudder the tail would go left, and he answered in the affirmative that he taxied in accordance with the way the tail swings rather than the nose.

The maintenance officer had published a list of airmen authorized to taxi without having sufficient evidence of their qualifications. Also, the airman serving as wingwalker could have used better judgment than to allow the taxiing airman, who was officially considered a student and was getting on-the-job training, to taxi the T-6, especially during the gusty wind conditions.

Every base should have a program to train airmen in the ground operation of aircraft, and physical exams should be given to each airman. The checkout for taxiing should be in accordance with AF Regulation 62-10B and the physical exam should be thorough enough to determine visual acuity at 20 feet, depth perception, color vision and muscular balance.

MEDICAL SAFETY

"SAY DOC, WHAT CAUSES THAT DIZZY FEELING"

When man started to fly he relied upon visual reference to the horizon and his sense of feel to maintain straight and level flight in an airplane. Being of a curious nature, he was not satisfied until he had tried to fly into the clouds or above the clouds. The early pilots learned from first-hand experience just how unreliable the sense of feel became when visual reference to the horizon was lost. The late Col. James Ocker expressed it by saying, "The only way I ever came out of the clouds was straight down and going like hell."

This inability to maintain straight and level flight without visual reference to the horizon is easily explained when you understand a few fundamentals of the way the body maintains its balance and orientation.

The inner ear has a bony structure shaped somewhat like a jug out of which arise three circular tubes filled with fluid. Each of these tubes is set in a different plane; one vertically, one horizontally, and one obliquely. The bony structure, which also contains fluid, is responsible for the static sense of direction while the tubes give a sense of rotating or turning. The interior of the bony structure and the tubes are lined with a great number of hairlike projections, and the movement of the inclosed fluid over these projections stimulates nerve fibers which tell a pilot that he is turning and in what direction gravity or centrifugal force is acting. However, it is important to realize that the fluid in these bony structures is like the fluid in any system—once it starts to move, inertia keeps it moving after the force initiating the motion has ceased. Thus, the stimulation of the hairlike projections in the bony structures falsely informs man that the motion is continuing and leads to confusion or disorientation.

Dizziness or confusion as to the body's position or the airplane's position with reference to the horizon often results when the airplane is moving rapidly up and down, yawing or rolling as in flight through turbulent air. This state of becoming confused and losing balance is commonly referred to as vertigo.

Normally the sense of vision is so strong that humans are only vaguely aware of the other senses of balance. In instrument flight, since the visual reference to the horizon is lost, the pilot becomes easily confused if he attempts to rely solely on the sensation produced within the inner ear. One of the important things to the pilot about vertigo or disorientation is that it may appear suddenly without warning or it may be the result of prolonged exposure to movements about more than one axis.

Based on early experience with the inability to fly without visual reference to the horizon, there was developed a series of flight instruments which the eye could refer to and thus counteract the false sensations produced in the inner ear. Instruments such as the turn-and-bank indicator, the rate-of-climb indicator and the artificial horizon enabled the pilot to use the stronger sense of vision and override the false impressions he would normally get from "the seat of his pants."

For the Air Force to develop an all-weather flying concept, it is of great importance for each pilot to recognize that confusion and vertigo are the price demanded by unwillingness to believe what he sees reflected in the flight instruments. These sensations of confusion or dizziness have cost many pilots their lives.

Night flying can be much more confusing than simple instrument flight through clouds. Probably many of the accidents and fatalities in night flying result from the fact that pilots rely too much upon their night vision and other senses, rather than upon their instruments. Any experienced pilot can tell how he has mistaken a star for a light beneath him and how he thought lights were moving past him, when actually he was turning. An inexperienced pilot can easily become so confused that he actually does not know which way is up.

Once the pilot knows that these sensations experienced in instrument flight are perfectly normal and that he may feel them at any time, he has taken the most important step towards disregarding them in his instrument flying.

USAF SETS UP CHARACTERISTICS FOR PORTABLE SURFACE WIND INDICATOR

Upon the recommendation of Air Rescue Service, USAF has established military characteristics for a portable surface wind indicator. This surface wind indicator is required to fulfill the need for a device which can be parachuted from aircraft to the surface at a desired time and can transmit or indicate to aircrews the local surface wind conditions at the spot where it was dropped.

It is felt that a device of this nature is needed for air rescue operations because there is no equipment presently available which can satisfactorily indicate surface wind velocity and direction for operations involving helicopter landings, dropping of A-1 lifeboats, and parachuting of personnel to survivors of aircraft crashes in remote locations. Airborne infantry, liaison squadrons, and aerial supply missions also have need for a portable surface wind indicator.

AIRBASES ADJACENT TO WATER

Many of our Air Force bases (Mitchel, Selfridge, Langley) border on large bodies of water, and their location presents a serious problem of rescuing occupants of aircraft that ditch or accidentally fly into the waters adjacent to the airfield. Night ditching makes rescue even more difficult.

Here are some of the factors to be considered:

1. Usually the control tower will know that a ditching is imminent or has already occurred.

2. Ordinary motorboats may increase the hazard by igniting gas that is likely to be covering the water.

3. In winter, ice floes may impede rescue.

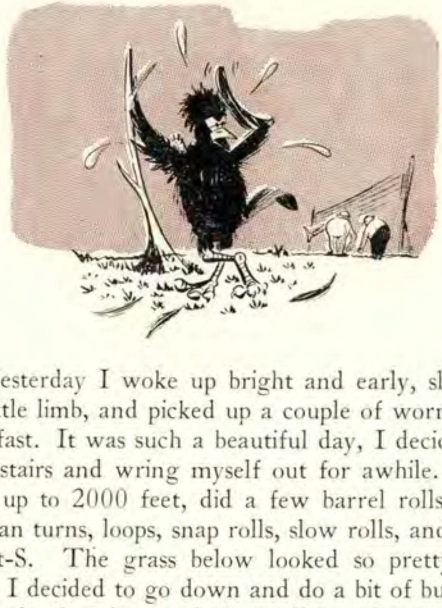
4. The ditching is likely to be a poor one because of unpreparedness and because the landing gear will probably be extended.

5. There is little in the airplane that can act as flotation gear, but if the cabin could be kept airtight, it might displace enough water to float the airplane. Opening of emergency doors and side hatches may be unwise.

What measures has your base taken to provide quick and efficient rescue from adjacent bodies of water?

THE HAZARDS OF BUZZING

A robin and a sparrow ran across each other one fine morning, and the poor sparrow had been beaten up something terrible. He had bald spots all over his head, most of the feathers were gone out of one wing, his beak was twisted out of shape, and he had a decided limp. Upon inquiry by the robin as to what happened, the sparrow replied:



"Yesterday I woke up bright and early, slid off my little limb, and picked up a couple of worms for breakfast. It was such a beautiful day, I decided to go upstairs and wring myself out for awhile. So I went up to 2000 feet, did a few barrel rolls, Immelman turns, loops, snap rolls, slow rolls, and then a split-S. The grass below looked so pretty and green I decided to go down and do a bit of buzzing and hedge-hopping, and then call it a day before it got too hot.

"I went into a terrific power dive from 2000 feet, pulled out about an inch from the ground, flew along over the grass around a tree, over a bush—just having a marvelous time! Of course you know about that big, green hedge that runs around that large estate. Well, I was pointing for that and picking up more speed all the while. I flew along the base of the hedge, zoomed up over and down on the other side—and for about five minutes I was in the roughest badminton game you ever saw."

CAA SAFETY AGENTS NOW TRAINED IN CELESTIAL NAVIGATION

Additional CAA Aviation Safety Agents are now being trained in advanced celestial air navigation so they can certificate the navigators required for the increasing number of long-range scheduled airline trips, especially over-ocean hops.

"Celestial navigation can be simplified so there is no good reason why everybody shouldn't recognize and use a minimum of 12 stars," Mr. Harley W. Clapsaddle, Chief, Aircrew Personnel Section, CAA, said in discussing the course. "With 12 stars

as his friends, no hunter, fisherman or pilot need ever be lost on a clear night. It is better to be able to recognize a minimum of 22 stars, but 12 well selected for the different seasons will be effective. These CAA students learn in one lesson to recognize stars by which we navigate, and upon completing the course, have the ability to recognize stars they have not yet seen."

PROPELLER REVERSE THRUST

During application of power for reverse thrust after landings, the air turbulence past the tail surfaces will tend to snap the elevators to the UP position. This action will in turn move the pilot's and copilot's control column back very rapidly and with force enough, as experience has shown, to cause possible minor injury to either of the pilots should they be struck by the moving column. In view of this, it is recommended that the copilot assist the pilot in holding the flight controls (primarily the elevators) during propeller reversing to avoid any possible injury.

Caution should be observed regarding the amount of reverse-thrust power to be used under certain field conditions. Should the landing surface be covered with loose snow, dust, or light sand in sufficient quantities, it is possible during reverse power application to throw a cloud in front of the airplane dense enough to obscure visibility of the runway. Though heavier sand and gravel may not impair visibility, they may be picked up by the forward air surge and thrown into the propeller and engine, causing possible damage to either or both.

ENGINE ANALYZER

The Sperry engine analyzer has been installed on some of the commercial airliners. It is hoped that it will open up a new era in maintenance, eliminating up to 60 per cent of delays caused by power plant troubles.

The flight engineer uses the engine analyzer to check constantly every piston beat. He can immediately visualize any irregularity in engine performance because if trouble develops, graph-like patterns on the analyzer scope spot its location and nature at once. It is precise enough to isolate one spark plug from among the Stratocruiser's 224 plugs or the Constellation's 144.

Upon arrival at destination, the flight engineer can give the ground crew a specific list of maintenance items. This may eliminate many hours of trial-and-error trouble-shooting.

WRONG ALTITUDE . . . .
. . . . WRONG ATTITUDE

LOW ALTITUDE FLYING is dangerous. A pilot with the wrong attitude towards flying is dangerous. Put them both together and you've got a sure-fire hospital potential.

Take a look at the accompanying picture for an example. Nice mess, isn't it? Damage: To Aircraft — Total Wreck; To Pilot — Major Injury. But he'll live. It's all the result of two factors: wrong attitude and wrong altitude, the second being a direct outgrowth of the first.

Flying is a business that can't be taken lightly. You've got to know its limitations and govern your actions accordingly. This boy didn't.

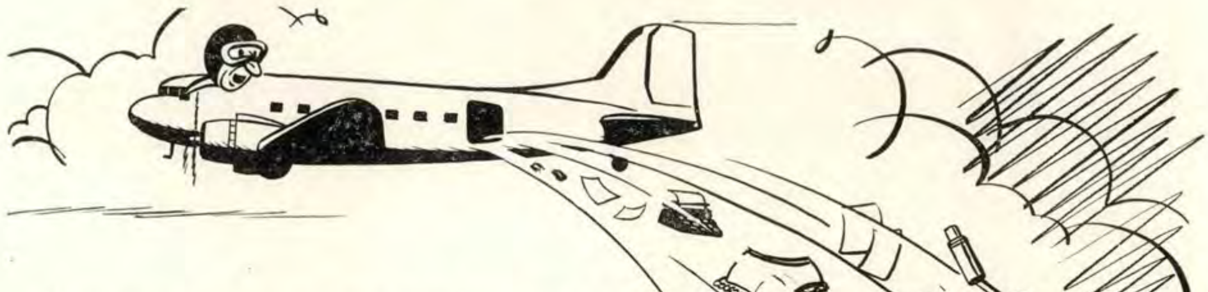
Being a solo cadet made him an old hand at the flying game, so why should he worry about altitude regulations. Such a surmise is what is classed as wrong attitude.

How did it happen? Our boy was "in the mood for showing off." So he made tracks out of sight of the base to put on a little show for the people on the ground. He engaged in acrobatics at a dangerously low altitude; as defined by this pilot, dangerously low means anything under 100 feet. He started his T-6 into a slow roll at said altitude. Just a little past the inverted position, the stick slipped from his hand and he lost control. You've seen the result.

Now the boy knows he did wrong and was even willing to admit it in his own nonchalant way. But here's the topper. After the crash he was of the opinion that training personnel should give better instruction in low altitude slow rolls, and he told them so.

Wrong attitude? It's easy to see that the altitude resulted from the attitude.

SHOULD YOU TOSS IT OVERBOARD?



Have you ever wondered just how much good it would do to toss equipment from an airplane if you were in an emergency and wanted to get increased range? Well, it's strictly a percentage proposition according to reputable aeronautical engineers. The effect of what you may jettison is in direct proportion to the weight of your plane. Hastily tossing B-4 bags out of a heavy bomber may prove of no help to you, and in some instances you may throw away equipment that you will need in the event you do crash.

Generally, a one per cent reduction in weight will increase your range by one per cent and allow one and one-half per cent reduction in power. In other words, one thousand pounds of personal equipment, baggage and emergency rations, if tossed overboard from a B-29 weighing 100,000 pounds would give you one mile more range for each 100 miles you had to fly.

In a lighter plane, like a C-47 weighing 25,000 pounds, discarding 1000 pounds of cargo or equipment would increase its range roughly four miles for each 100 miles.

Suppose you are in a B-29 with 3000 gallons of fuel remaining and your destination is 2100 miles distant. You check the cruise charts and find that you have gas enough for 2000 miles but not for that extra 100. You will have to reduce weight by five per cent. If your B-29 weighs 100,000 pounds you'll have to get rid of 5000 pounds at the start.

When a four-engine airplane loses one engine, if you cruise with the same power settings as before on the three remaining engines there has been a 25 per cent reduction in power. To maintain the same airspeed and altitude with the same power settings you will have to cut the weight by 17 per cent—one per cent reduction in weight equals one and a half per cent reduction in power required.

Getting rid of excess weight is thus of more value in maintaining altitude on given power settings than it is for increasing range. In other words, if 700 pounds tossed overboard lightens the weight of a C-47 by three per cent, it would be equivalent to increasing the available power by four and one-half per cent. This would mean that if this plane will just maintain 1000 feet of altitude at a certain power setting, by throwing 700 pounds overboard it would fly level at 4200 feet on the same power setting.

A study of cruise control charts will show that to obtain extra range in an emergency, or to maintain altitude after losing one or more engines, you will be in a more favorable position if you are able to salvo or jettison extremely heavy objects such as bombs or weighty cargo. Another point in favor of throwing heavy equipment overboard is to eliminate the possibility of its tearing loose and doing damage in the event of a crash landing or ditching.

But think twice before you toss out your shirt and water canteen.

★ *Cross Feed*

FLYING SAFETY
IDEA EXCHANGE

"WE'LL SPLIT THE TIME"

How often have you heard *that* phrase at the end of a flight when the pilot pulls out his pencil and the Form 1? One man actually held down the left seat throughout the flight, including the takeoff and landing, but he's a good Joe, so he'll give the other guy half the first pilot time. But first pilot time is something nobody can *give* the other guy. It has to be flown. And for the record, why not log it like you fly it? A still farther departure from an honest record of flying time follows the remark, "We can *all* get time—I'm an IP." There's a good chance that the third fellow may never get his hands on the controls, but he's in the Form 1 for either straight CP time or maybe even half the P time.

A statement as to the amount of time a man has in a particular type aircraft is invariably found in an aircraft accident report. Perhaps it would be interesting and pertinent to know in each case just what percentage of that time was logged in the manner described above.

The sanctity of the log book is best preserved by the conscience of the pilot who logs the time, and the conscience ought to hurt plenty if time is logged incorrectly. It is hardly more honest to inflate the Form 5 via the Form 1 than it would be to sneak into the files at night and write time down on it. When you fly with a pilot who hogs the left seat and makes all the takeoffs and landings, you're just making it easy for him to get away with it if you let him split the time with you.

What is the correct way to log time then? AF Regulation 60-7 covers logging of time in fairly specific terms, but these have been subject to considerable misinterpretation at times. Specifically, time should be logged the same as it's flown. In general, this should be as follows:

P: Sits in the left seat. Handles the primary controls, i.e., rudder, elevator and aileron. Handles throttles, supervises copilot and engineer. Pays particular attention to flight instruments.

CP: Sits in right seat. Handles auxiliary controls under supervision of the pilot, i.e., landing gear control, flap control, cowl flap control, prop control, fuel boosters, carburetor heat, etc.

IP: Sits in right seat. Instructs or checks pilot in technique and procedures. Does not handle primary controls except for demonstration of maneuvers or in emergency. Performs copilot's usual duties. Normally logs IP only on local transition and instrument practice flights.

These rules are based on experience and common practice and may be considered an enlargement on the intent of AF Regulation 60-7. They are general and the occasion sometimes warrants exceptions, even regarding the right and left seats. The only occasion when time is logged other than when actually at the controls is in the case of command pilots, or an instructor pilot giving instructions while standing between the pilot and copilot. Note particularly that AF Regulation 60-7 states . . . IP duty . . . "May not be performed while flying for personal flying proficiency."

Log time honestly and let your Form 5 be an accurate record of time as you flew it. On a cross-country flight with a qualified pilot in the left seat, log CP even if you are a designated IP. There's nothing wrong with CP time. Thousands of pilots log it every day. If you're carrying three pilots, rotate them through both seats, and log it like they fly it. If you're out to build up an impressive total of first pilot time, your best bet is to do it behind the wheel in the left seat of an airplane . . . not with a pencil.

1st. Lt. John Aidem
10th Rescue Detachment
APO 980, c/o P.M.
Seattle, Washington

DIVE FLAPS — F-80, F-84

Research has been made on damage occurring to the F-80 and F-84 during wheels-up landings with the dive flaps down. Results proved that under such circumstances the flaps on the F-80 were shoved up into the fuselage during contact with the runway, and the nose of the F-84 was considerably torn up.

Dive flaps should remain in the retracted position whenever a wheels-up landing is made.

This applies to ditching these two jets also.

(Note: Dive flaps have very little braking effect on the F-80 and F-84 at speeds below 200 mph.)

TAKE A RADIO OPERATOR ALONG

The Air Rescue Service has expressed concern to MATS headquarters over flights proceeding to the Labrador and Newfoundland areas without qualified radio operators aboard the aircraft.

It is pointed out that while flights to Labrador and Newfoundland are along established airways, there exist, over certain of the flight legs, areas in which contact with voice/ground stations is not usually possible. Examples are a 223 nautical-mile stretch between Mingan, Quebec, and Goose Bay, Labrador; a 228 nautical-mile overwater run between Charlottetown, P.E.I., and Stephenville, Newfoundland; and a 231 nautical-mile overwater run between Sydney, Nova Scotia, and Argentia, Newfoundland. An emergency that could conceivably go unreported if only a command transmitter were available for use might be averted if a liaison set and qualified radio operator were aboard.

It is strongly recommended that the various commanders and pilots contemplating flights into remote regions give consideration to the area into which a flight will be conducted and insure employment of adequate crews and equipment aboard all flights.

ROBERT E. CRON, JR., Col., CE (USAF)
Vice Deputy Commander, Services
Hqs. MATS, Andrews AFB, Wash. 20, D. C.

F-51 ENGINE FAILURES

Investigation of several engine failures involving F-51D aircraft revealed that the idling mixture on the carburetors had not been properly adjusted in accordance with TO 03-10-51. Also, pilots were utilizing the auto-rich setting on the mixture control for extended periods of time and were using only 40 to 45 inches manifold pressure for takeoff. This resulted in low spark plug life and engine failures.

An Immediate Action technical order, 01-60J-70, dated 10 May 1949, requires that F-51 aircraft be placarded to remind pilots to use 61 inches manifold pressue and 3000 rpm for takeoff, to clean the engine out every half hour using this power setting, and again before landing.

NOSE GEAR — F-86

Trouble has been experienced with the retraction of the F-86 nose gear at airspeeds higher than that speed right after takeoff. If the nose gear was retracted at high speed, 200 to 250 mph or above, there was a slamming effect of the nose gear. This caused high compression loads to be imposed on the nose gear main actuating cylinder piston rod, resulting in failure of the piston rod.

Consequently, TO 01-60JL-22, dated 17 March 1949, was published to require that the F-86 be placarded as follows: "Retract landing gear at lowest possible airspeed."

Latest word from AMC is that North American Aviation representatives will furnish the necessary parts to install a restrictor in the hydraulic return line. F-86 Serial No. 48-160 and subsequent will have this restrictor installed before delivery. Accomplishment of this modification will be reported to AMC, and the restrictions imposed in TO 01-60JL-22 will no longer apply after modification.

(Note: It has been reported that the F-80 nose gear will not fully retract at high speeds, but no damage has been reported.)

LETTERS TO THE EDITOR

HAZARDS OFF AIRWAYS

Outside control areas no one is responsible for assignment of a cruising altitude to be maintained during instrument flight conditions. First, Military Flight Service does not assign the altitude. Second, ATC is concerned with the assigned altitude only while the aircraft is in control areas and that fact is emphasized when the clearance is sent over the radio, such as, "ATC clears Air Force 1234 to *cruise and maintain* 5000 feet *while in control areas* . . ." Third, the pilot can change his cruising altitude at will (as long as he flies odd or even altitudes depending on compass heading) while outside control areas and not be in violation of existing rules or regulations.

Thus today we have an unsafe air traffic control set-up which will become increasingly dangerous with increasing volumes of air traffic.

For example: An airplane cleared IFR direct from Las Vegas, Nevada, to San Angelo, Texas, and an airplane cleared IFR from Albuquerque, New Mexico, to San Antonio, Texas, would cross courses near Walker Radio Range Station (a likely checkpoint for instrument navigation but not a CAA compulsory reporting point) and possibly make good a collision course. Both pilots would be correct in maintaining any odd altitude plus 500 feet above the minimum altitude even if they had been assigned different altitudes while cruising in control areas since each would be flying a magnetic course between 90° and 180°. Situations similar to the above can be visualized at numerous locations throughout the United States.

When I expressed dissatisfaction at this unsafe condition at a Flight Service Center I was told: "Don't fly outside control areas, always fly airways and be protected by an assigned altitude." Notice the increase in air miles required to go "airways" instead of "direct" for routes such as El Paso to Amarillo, Tucson to Albuquerque, Rapid City to Grand Island, or Amarillo to North Platte. The increase in air miles would prevent a short-range aircraft from meeting IFR fuel requirements for distance to destination plus alternate plus 45 minutes cruising.

At my home station I conducted a quick survey of some 23 pilots of whom five possessed green instrument cards and 18 had white instrument cards. The questions asked of them were:

1. Can a pilot on an instrument flight, after having been assigned a cruising altitude by ATC, change his cruising altitude without ATC approval when outside a control area?

2. Do you feel protected from collision with other aircraft if you maintain your assigned altitude on an instrument flight when outside control areas?

The answers I received convinced me this letter should be written!!

Sixteen pilots (two holding green cards and 14 holding white cards) answered "No" to the first question and "Yes" to the second. These men were shocked to learn the correct answers. Other pilots were cognizant of the truth and answered "Yes" to the first question and "No" to the second question, except one pilot who answered "Yes" to both because he believed most pilots would maintain their assigned altitudes. All pilots were dissatisfied with and severely criticized the existing regulations which could be the underlying reason for a mid-air collision.

Therefore it is requested, yes, even begged, that an agency be established that will have absolute jurisdiction over the assignment of routes and cruising altitudes for aircraft during instrument conditions throughout *all* the United States instead of just along the narrow 10-mile-wide civil airways.

Yours for better instrument flight control.

John W. Bennett, Captain, USAF
Eglin AFB, Florida

There is a program underway to control all navigable airspace not absolutely necessary for military danger areas. Of course, this will take quite some time because of the increase in personnel and equipment required by CAA to control all of this area.

It is strongly advised to fly airways whenever practicable on instrument flights, and all pilots should be impressed by the hazards which may be encountered while flying instruments off airways.—ED.

★

2700 MILES ON THREE ENGINES

A crew of Flight "B" of the 375th Weather Reconnaissance Squadron recently took off from Shemya AFB, Alaska, on a routine weather reconnaissance mission. They planned to fly their B-29 south from Shemya for 1050 miles and return, with 12 hours as the estimated time in flight. However, 19:15 hours later they made a three-engine landing at Elmendorf AFB with but two hours' fuel remaining and anything but a "routine" mission behind them.

Because of severe headwinds and failing communications it was decided to turn back to Shemya when 900 miles out on their proposed track. Immediately after the turn the number two engine failed and was feathered.

During the letdown for a GCA run at Shemya the weather situation dropped below 500 feet and became indefinite, visibility reduced to three-quarters of a mile, and the wind increased to 55 knots (gusts to 65) from a direction 85 degrees across the runway. Since altitude was already lost in descending it was deemed advisable to try one ground controlled approach. Landing out of the approach, however, was rendered impossible by the extremely low visibility and the accompanying crosswinds. A successful three-engine go-around was made and it was decided to proceed to Elmendorf AFB, the only station reporting favorable weather conditions.

En route to Elmendorf heavy clear icing forced the aircraft to lose altitude to 6500 feet; however, precise radar navigation was used to avoid higher mountainous terrain. After a 3700-mile flight of which 2700 miles were made on three engines battling Aleutian weather, a successful landing was made at Elmendorf.

Crew members aboard the aircraft believe their 2700 miles on three engines to be a record for B-29 aircraft. They were: 1st Lt. Alan W. Elder, aircraft commander; 1st Lt. Robert B. Simon, pilot; 1st Lt. William D. Burchell, navigator; 1st Lt. Robert L. Lulofs, weather observer; S/Sgt. William A. Sheridan, engineer; Sgt. John W. Trout, radio operator; S/Sgt. Frank J. Helberg, radio operator; T/Sgt. John Weindorfer, crew chief; Pfc. James C. Wagnon, dropsonde operator, and S/Sgt. Dean H. Cremer, radar operator.

Public Information Officer
375th Reconnaissance Sq, VLR, Weather

WHY?

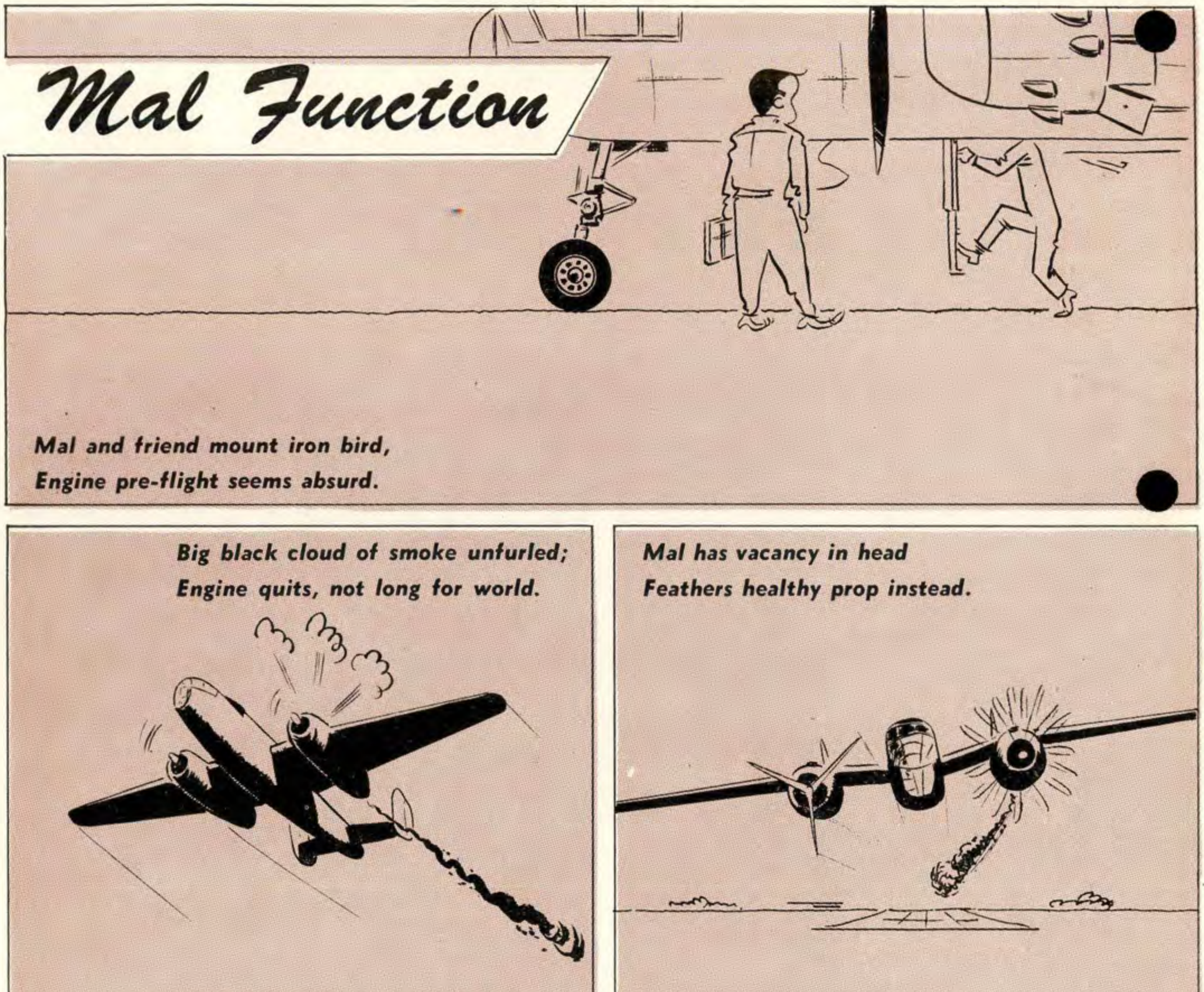
MOST PILOTS in the Air Force associate the term "upper zone 3" or "lower zone 2" with their early training as cadets. The zone system was instituted to provide safe lateral clearance for airplanes operating on local night training missions. So long as the pilots stay in their own backyard this system works. But when one pilot becomes careless and flies into another zone, anything can happen and usually does.

This is a story of two pilots operating different types of airplanes, one a T-6 the other an F-51, in different zones at the same altitude. The F-51 pilot, having had radio trouble from the time he took off, decided to take a short cut home. He hopped the fence and invaded the T-6 pilot's domain. The result was a mid-air collision fatal to the pilot of the F-51 and a passenger in the T-6.

Local regulations prescribed the procedure for leaving the night flying zones at this particular base. The F-51 pilot ignored the procedure to leave his zone and decided to proceed straight ahead to the base. His course took him through the boundary of the two zones, and flying faster than the T-6, he didn't take long to plow through the trainer which was flying close to the boundary with an inoperative tail light.

Obviously, the F-51 pilot had not been impressed with the importance of following the prescribed letdown procedure.

Why?



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