Flying Safety

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THE COVER PICTURE

Three F-80's of the 57th Fighter Group stationed at Elmendorf AFB, Alaska, grace this month's cover. The F-80's are flying over typical Alaskan winter-time mountain terrain. The glacier directly beneath the planes never melts, of course, although snow on the mountains themselves disappears in the summer months except for deep drifts in ravines and on top of the peaks. The 57th Fighter Group pioneered jet operations in Alaska after switching to F-80's from F-51 fighters. The story on page two has further information on this group.

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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.

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FEATURES

WHO IS
JABBER-JAW?

IF YOU FLY IFR much, you know this guy. Traffic is moving along, communication between planes and radio range stations is normal; everything is going along fine. Then all of a sudden, Jabber-Jaw comes on the air in the middle of somebody else's transmission. You find him almost everywhere you fly. Without listening to determine if the channel is clear, he clamps down on the mike button and begins his novelette entitled, "Position Report."

The plot is always about the same, and it runs on and on into hundreds of words. On a recent flight from Langley to Mitchel, two pilots heard the following position report near Washington, D. C. and reported it to FLYING SAFETY.

"Brandywine radio, Brandywine radio, this is Air Force 1234, Air Force 1234 calling Brandywine radio. Come in please Brandywine radio. Air Force 1234. Over." ————

"Roger, Brandywine radio, this is Air Force 1234 calling you on able channel. We have a position report to give you. Are you ready to copy? Over." ——

"Roger, Brandywine radio, this is Air Force 1234, Air Force 1234, a Charlie 47, a Charlie 47 . . . uh . . . we were over . . . uh . . . uh . . . Beltsville, I think it is, fanmarker at . . . uh . . . one-two, one-two minutes past the hour. Our altitude at the present time is . . . uh . . . 4000, 4000 feet. We departed Mitchel Air Force Base, Mitchel Air Force Base. Our . . . uh . . . destination is . . . uh . . . Greenville, South Carolina, destination Greenville, Carolina. At the present time we are cruising Item Fox Roger. We estimate . . . uh . . . Quantico radio range station at . . . uh . . . just a minute . . . uh . . ." (holds mike button down for 30 seconds) ". . . we estimate Quantico, Virginia at three zero, three zero. Did you get all that, Brandywine radio? This is Air Force 1234."

Of course Brandywine radio "got all that." The operator had probably played a game of chess, eaten lunch and smoked three cigars while he was taking the message.

If you fly frequently in IFR weather, you know this report is not exaggerated. Stupid, inconsiderate, unnecessary conversation—that's Jabber-Jaw's position report. He is largely responsible for the crowding of frequencies during IFR weather. And he may even contribute to an accident. With many planes in an area, all invisible to each other, interference with radio communications could very easily result in a mid-air collision if pilots were unable to receive instructions properly.

For the benefit of pilots like the long-winded individual just described, it is unnecessary to call "Brandywine radio, Brandywine radio" over and over. Station operators know their name and will answer the first time you say it, *if* you'll give your identification *once* and get off the mike button. Also, you don't have to ask, "Are you ready to copy?" You're wasting some more of everybody's time. He's sitting right there, pencil in hand, with a blank position report form in front of him when he answers your call. Taking two minutes and 300 words to give a position report that should *never* require more than eight or 10 seconds is simply broadcasting your ignorance for everybody in the air to hear.

If you think you can't give in 10 seconds every bit of information which this pilot took half the day to give, try it. The secret is to make your calculations, plan what you are going to report, and then say it. The sample report below is the procedure directed on the inside back cover of the Radio Facility Chart. Time yourself while you read in a normal, radio conversational voice.

"Brandywine radio, Air Force one-two-three-four, over Brandywine one-two, 4000 feet, Mitchel to Greenville AFB, IFR. Estimate Quantico three-zero. Over."

Since the range station operator is merely filling in blanks, he will get all the information.

Check up on your position reporting technique. Make certain you are not Jabber-Jaw.

Flying Safety in ALASKA

By 1st Lt. Hal J. Basham
Flying Safety Staff

If you're a career man in the Air Force today, sooner or later you will find yourself serving in the last great American frontier. Impetus of the polar concept of aviation, and expansion of all phases of Air Force operations in the Alaskan Theater make such an assignment almost inevitable. And if you're like most people, you have been told stories of that theater that are a long way from the facts.

From no theater of USAF operations anywhere in the world has the true picture of operations and conditions been presented to personnel in the United States and in other overseas theaters in more weird and distorted fashion than from Alaska. Since the early days of World War II, fiction, fact and fantasy have been hashed together and served over and over to those unfamiliar with Alaska until it has become almost impossible for personnel outside the theater to have an accurate idea of actual operating conditions.

What are the true conditions under which air crews, mechanics and communications, weather and administrative personnel carry out their missions? What are the actual hazards and difficulties they must meet and surmount throughout the year? From first-hand interviews in Alaska with dozens of men in each of these assignments throughout the theater, from generals to brand new graduates of flying school and privates on the line, this is the story as it was presented in word and picture to Flying Safety's correspondent.

To begin with, Alaska—so often thought of in terms of the desolate, arctic north—cannot be discussed intelligently as one single locale. Weather, terrain and flying conditions in the theater differ as widely as in opposite sections of the United States. Summer and winter seasons present entirely different problems. For instance, weather varies at Ladd Air Force Base, Fairbanks, from 100° F. high in summer to occasional minus 50° lows in winter.

Summer flying throughout the theater is almost identical with that found in the United States except that the principal weather hazard in the States, the thunderstorm, is missing from the Alaskan picture. Pilots frequently complete a two-year tour of duty in Alaska without so much as seeing lightning or hearing thunder. Such thunder-shower activity as does exist is relatively mild without dangerous turbulence.

Winter operating conditions in Alaska present a curious array of contrasts and similarities to flying in the United States. On the Alaskan mainland conditions are much the same as those in the northern states except that the greater cold intensifies all the problems and almost all flights are IFR flights. Flying along the 1500-mile Aleutian chain presents still another picture which will be discussed in a later issue of Flying Safety.

Operations in Alaska center around the two principal bases, Elmendorf AFB at Anchorage at the northern extreme of the Gulf of Alaska in southwest Alaska, and Ladd AFB on the central plain at Fairbanks. Other important stations include Eielson AFB just east of Ladd, Marks AFB at Nome on the Seward Peninsula, and Cold Bay and Adak in the Aleutians. There are a number of other bases scattered throughout the theater where less intensive activities are conducted.

Jet fighter operations have been pioneered at Elmendorf by the 57th Fighter Group and extensive bomber operations have been carried out by B-50 and B-29 units on TDY from the States, using know-how gained by the 72nd VLR Photo Reconnaissance Squadron based at Ladd and the 375th Weather Reconnaissance Squadron at Eielson AFB.

Alaskan flying as the pilot finds it, can be illustrated by what happens to a pilot reporting to the theater. The first thing he learns, whether he is a colonel and green-card command pilot or a brand new graduate of flying school, is that his instrument card is not recognized in Alaska and that he cannot fly first pilot outside the local area of his base until he has passed the theater checkout. The theater checkout consists of an instrument check (all checks are based on green-card requirements) and route checks over all air routes in the theater. A pilot cannot fly as first pilot on any route until he has flown the route twice with a designated instructor pilot and made actual or practice instrument and GCA approaches at the destination.

The purpose behind such a rigid checkout policy is readily grasped when it is realized that the Alaskan Theater, because of its large portion of instrument weather, has of necessity come nearer than probably any other theater to reaching the goal of an "all-weather" air force. The collective philosophy of pilots of this theater was aptly expressed by the pilot of the ATC C-54 on which FLYING SAFETY's correspondent traveled to the theater. At Ft. Nelson, Canada, this correspondent inquired of the pilot "How's the weather to Fairbanks?" The matter-of-fact reply was, "Don't know—haven't checked yet. But it doesn't matter, we're going anyway." That's how they fly weather throughout this theater the year around! *It doesn't matter, we're going anyway.*

AACS in Alaska modestly claims that the best GCA teams in the USAF are in this theater. And every single pilot interviewed in the theater was enthusiastic in his support of this claim. After riding through a GCA landing at Nome with an indefinite ceiling of 100 feet and visibility one-eighth of a mile with the GCA final approach controller giving the pilot two-degree course and 10-foot glide path corrections, this correspondent was ready to go along with the crowd. The pilot on this particular flight broke out over the centerline at the end of the runway. Three other planes in the pattern at the same time also landed on the first pass. It is a standing requirement in the theater that all planes landing during duty hours at bases other than Elmendorf and Ladd make GCA landings regardless of weather. This policy keeps GCA crews proficient and assures that pilots maintain their GCA proficiency as well.

One commander pointed out that there are two types of instrument pilots in the Alaskan Theater—good ones and dead ones. The unusual emphasis on

instrument proficiency is a necessity in Alaska not only because much of the flying is done under instrument conditions, but because of the type of terrain over which much of the flying is done.

"The foothills begin up here where the Rocky Mountains stop in the States," was the way one veteran pilot put it. Mount McKinley, towering over 20,000 feet, heads the list with mountains above 12,000 feet too numerous to list. Airways in Alaska often pass within 20 miles of mountains on either side of the course. Therefore, it is essential that pilots know their exact position at all times and that they stay exactly on the airways. Except where tactical requirements dictate otherwise, a flight off the airways is almost unheard of.

"It's not that our instrument conditions are any worse than anybody else's," one pilot remarked, "it's just that more of our clouds have rocks in them." Not only do pilots fly the airways, but they constantly track inbound and outbound to check the radio range courses against their radio compass and magnetic compass readings to make sure they are not flying a beam gone astray. In addition, a compulsory pilot reporting system is enforced throughout the theater. After each 30 minutes of flight and over every radio station, planes must report their position and give a complete weather report for the portion of the route just flown. This PIREP system is extremely valuable to weather forecasters since reporting stations in Alaska are few and far between as compared to conditions stateside.

When they hear Alaska mentioned most pilots immediately have a vision of blinding snowstorms and insurmountable icing conditions. Yet experienced pilots in the theater, jet pilots, transport pilots and bomber pilots, are unanimous in their opinion that icing conditions are no worse and in many cases less severe than those encountered in winter flying in the United States. Even in flights to and from the North Pole, which have become routine for some units, icing usually consists of a mild form of rime wing ice and a somewhat more severe form of propeller ice. As a matter of fact, propeller ice is listed as a greater hazard than wing ice. Prop and wing icing have been encountered at temperatures from freezing to 40 below zero. Carburetor ice is rarely a problem as use of carburetor heat is SOP. Sometimes full carburetor heat is required even on takeoff. A fourth type of ice common in the winter is windshield ice which forms inside the cockpit as a result of extremely cold outside temperatures and the moist breath of the crews in the cockpit. On the big bombers one

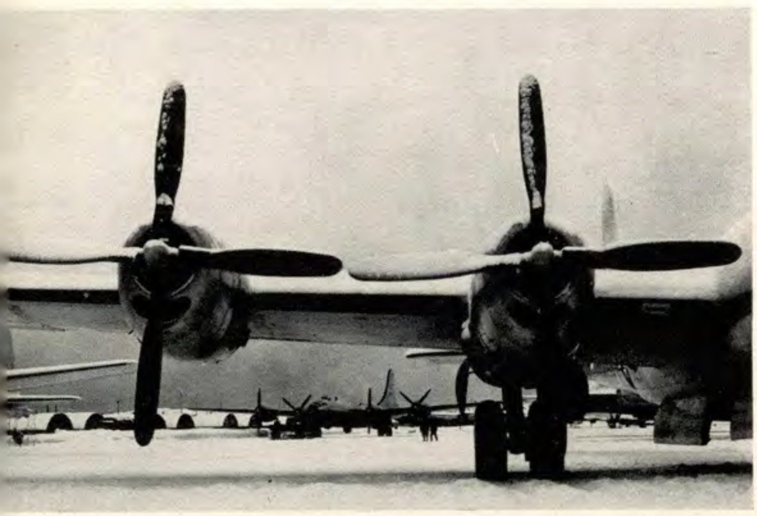
crew member often stands by with a plastic ice scraper and cleans the windshield in front of the pilot throughout the final approach.

The most persistent and aggravating form of icing in Alaska is wing frost. Planes without wing covers which are left out overnight in cold weather inevitably have a heavy coat of wing frost which must be removed before takeoff. Planes kept in a warm hangar develop wing frost in a very short time when moved outside, making it mandatory to get in the air as soon as possible after leaving the hangar. Wing "slip covers" are used on most planes which must remain outdoors in winter. When conditions conducive to heavy wing frost exist, these covers are left on during preflight and runup and removed at the end of the runway just before the takeoff roll is begun.

Specific problems applicable only to their type of operation have had to be solved by both jet fighter and bomber units. Condensation of moisture in jet fuel became a serious problem last winter, threatening for a time to tie up all jet operations. The enterprising 57th Fighter Group switched one jet squadron to gasoline and found that they could continue to operate with only a very slight reduction in range by using gasoline instead of jet fuel. Meanwhile, analysts went to work on the problem of water condensation in the jet fuel. Experiments with double segregating and filtering, cold-soaking, and heating the fuel were carried out. A relationship between humidity and temperature was found to set off the trouble and steps were taken to overcome the problem. Confidence was expressed by fighter wing personnel that the water-condensation problem will be completely overcome this next winter.

Another problem jet fighters face is that of getting into a base surrounded by mountains under instrument conditions. Until recently jet operations were limited mostly to VFR flights. A special instrument flying research and training board of the 57th Fighter Group set about working out an approach system, using aircraft control and warning radar to guide the jets down to 2000 feet and line them up five to 10 miles out on the approach. GCA picks the jet up here and brings it straight in for a landing. Emergency pullup procedure has been worked out and the entire plan perfected to permit jet operations in any kind of weather. The plan, which will be taught all jet pilots in the area, has been forwarded with the recommendation that it be incorporated with the jet approach system set up in the United States.

Emergency equipment for jet fighters was a problem because of limited space in which to carry it. A



vacuum-packed sleeping bag which occupies a very small space has been incorporated into a parachute survival kit for fighters and will enable a fighter pilot to bail out or crash-land in winter and survive until he can be found and rescued.

A valuable survival training exercise known in the 57th Fighter Wing as a "pajama party" was worked out last winter during 20-below-zero weather. The group was called together for a regular mission briefing. Then instead of flying they were loaded in trucks, taken out in the frozen wilderness, and told they were simulating bailout conditions and had to walk two miles to where their planes had crash-landed. They could use only the equipment they carried when they "bailed out" to reach the "plane," then they would have the use of any equipment that might be on the plane. Arctic survival specialists from the 10th Rescue Squadron monitored the exercise and guarded against casualties. Men who had attended the Arctic Survival School worked the problem out readily and those who had not were impressed immediately with the necessity for adequate arctic survival training and equipment. Similar training missions were run to good advantage wth troop carrier personnel.

Bomber personnel experience their greatest difficulty in effort expended before their plane leaves the ground. Outdoor maintenance is extremely difficult, and in some cases impossible, in the winter. Such matters as routine runup and pressure check become major undertakings at temperatures of minus 30° F. For each mission a vast amount of emergency equipment must be loaded in the plane. Crews must dress in complete arctic clothing to be equipped properly in case of ditching or crash landing. To encourage wearing of arctic clothing, use of heaters is discouraged on winter flights. It takes from one to two hours to load and unload a B-29 for each winter flight. Pre-heating of engines and cockpits must be started long before takeoff time in order for engines to start and instruments to work properly.

The old story about draining the oil and heating it boiling hot before the next flight is a little ridiculous when applied to a B-29 or other large aircraft. This practice, however, is still utilized on small planes in Alaska. Bomber crews are in accord that once the tedious preflight duties are accomplished and the plane is airborne, flying in the Alaskan Theater is no more difficult than anywhere else in the world.

Ed. Note—Part two of "Flying Safety in Alaska," dealing with such subjects as maintenance, navigation, weather forecasting, AACS operations, and rescue and survival, will appear in the next issue.

WELL DONE

to

1ST LT. TRACEY B. MATHEWSON
51st Fighter Wing

TRYING TO MAKE a power-off landing at night in an F-80 is a tough assignment and calls for the utmost in skill and technique. When Lt. Tracey B. Mathewson was confronted with just such a problem, he displayed superior airmanship and judgment in making a successful landing.

Lt. Mathewson was at 21,000 feet and about 25 miles northeast of Naha, Okinawa, when he felt his airplane lurch suddenly. He immediately checked his engine instruments and saw the tachometer and tailpipe temperature dropping rapidly. He realized that he had a flameout and immediately placed the throttle in the stop-cock position. He called the island ground controller and informed him of the trouble, then changed to the Naha tower frequency and explained the nature of the emergency. He told the tower that if he failed to get the unit started at a lower altitude, he would land "dead stick" at Naha.

He let down to 18,000 feet, the highest altitude recommended by T.O. to attempt an airstart, and went through the recommended airstart procedure. When the unit failed to start, Lt. Mathewson pulled the nose up to drain the tailpipe, then continued his descent. At 16,000 feet and again at 14,000 feet, with an indicated seven per cent rpm, he unsuccessfully attempted airstarts.

At 10,000 feet he let down through broken clouds and jettisoned his tiptanks, each of which still had an estimated 20 to 30 gallons remaining. He lowered his gear and used the emergency system to insure that it was in the locked position.

While in a large orbit to the left over Naha, Lt. Mathewson attempted another airstart. He engaged the ignition boost switch, advanced the throttle, and turned on the I-16 pump. The fuel pressure rose and he heard an extremely long starting rumble.

Another F-80 pilot who had Lt. Mathewson's airplane in sight called him on the radio immediately and notified him that fire was continuing to shoot out the tailpipe 40 to 50 feet. Lt. Mathewson retarded the throttle to idle and turned off the I-16; the fire subsided and the fuel pressure dropped to zero.

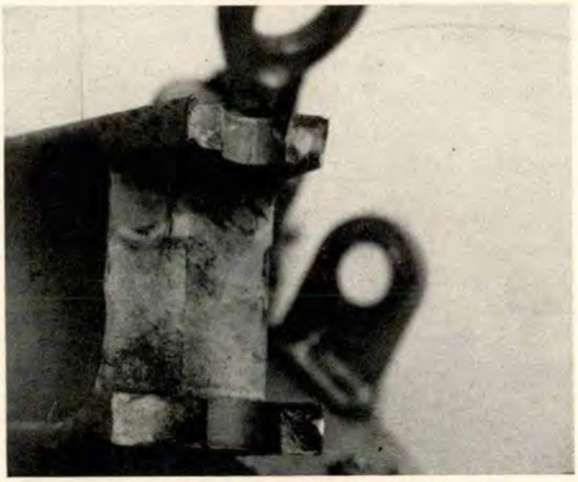
When he tried one last airstart at 2200 feet, he again heard a long rumble. This subsided when he put the throttle in the idle position, but each time he advanced the throttle the rumbling was heard. The other F-80 pilot advised him that he still had fire streaming from his tailpipe.

Lt. Mathewson then cut the unit off again and positioned himself for a landing to the south. He came across the north end of the strip on a heading of 90 degrees at an indicated airspeed of 160 mph, with gear down and locked, dive flaps down, and wing flaps up. He made a 270-degree turn to the left, gradually reducing his airspeed, and lined up on a short approach. When he was certain of his touchdown point, he lowered full flaps. He made a good landing in the first third of the runway, and turned off the runway after completing his landing roll.

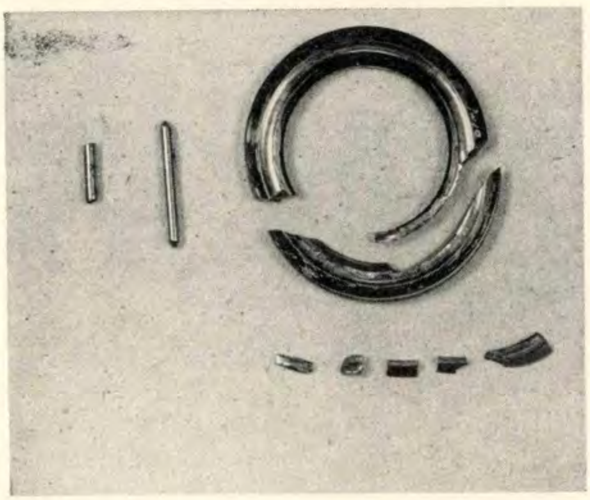
Although the unit was shut off, a fire was still burning in the tailpipe. This fire was easily extinguished by the crash crew, which arrived immediately. An immediate inspection of the airplane revealed no damage to the airframe. The tailpipe and exhaust cone were warped, but the heat had apparently been transmitted out the tailpipe, and the tail section showed no evidence of heat damage. A thorough check of the engine disclosed that all 14 nozzle diaphragm screens were collapsed, and three finger screens were collapsed, corroded and showed evidence of water. The control valve was dirty and there was some water in the air adapters. Investigation indicated that this condition probably caused the initial flameout and the resulting hot starts.

Lt. Mathewson rightfully deserves a Well Done for his calm and skillful handling of his plane in making the power-off landing at night and avoiding a serious accident.

After the blue main rotor blade flew off in flight, one of the remaining blades swung downward smashing the cabin.



Above: Bearing samples. Below: Old crack evident in upper fitting.



RUNAWAY ROTOR

As a result of the loss of a main rotor blade in flight, two men lost their lives in the helicopter accident pictured on this page. Findings of the accident investigation board are of value to every organization and every helicopter pilot and maintenance man in the Air Force.

The plane was on a local flight from a western base. The pilot apparently encountered difficulty on the flight, probably severe vibration. He was seen approaching the field at about 100 feet altitude just before the accident. About one mile from the field the helicopter went out of control, spun a turn and a quarter to the right, and crashed. The tail cone was torn off in the spin and fell some distance from the rest of the wreckage.

Investigation disclosed that the link assembly of one main rotor blade had failed and a main rotor had been lost in flight. The assembly was still intact on the rotor head and a clean break was found at the outer end through the bushing and pin hole. The break showed evidence of an old crack which had apparently existed some time prior to the final complete failure. The needle bearings on the inner race of the link assembly were damaged. There was a definite indication of heavy scoring on the hub spindle. This created a binding which resulted in damage to the link ears and the eventual loss of the blade in flight.

A blade change had been accomplished on this helicopter before the accident because of excessive vibration experienced on previous flights.

The accident investigating board recommended that in the future when a blade change was prescribed as corrective action for excessive vibration, the head should be removed and Zyglofluxed and bearings checked for unusual wear.

The board further recommended that pilots make it a practice to land as soon as possible when observing abnormal vibration in flight, and that on preflight inspections a close examination be made of the link assembly for forging or radiant cracks.

TO 01-230-23 requires a depot inspection of the head at 300 hours, but since this accident occurred after only 148 hours of flying, an earlier inspection appeared to be necessary. A recommendation to that effect was made in the UR submitted on the part.

This pilot had been having electrical trouble so he turned the generator to the OFF position. Later, upon entering the traffic pattern he put the gear switch in the DOWN position. Since he had no electrical power, the warning horn did not blow nor did the red light come on. The tower operator gave him a red light, but he did not notice it and went on to land wheels up.

This pilot had coolant trouble with his F-51, but he continued flying for 25 minutes by controlling the temperature manually. Then he called the tower and requested an emergency landing straight in. He informed the tower on final that gear and flaps were down, but neither the tower operator nor the mobile controller saw him until the sparks began to fly as he skidded on the runway.

There was no ground-to-air radio where this one was bellied in. On the first approach the pilot decided he was too fast so he made a go-around and disrupted his normal landing routine. After this disruption he was preoccupied while looking out to see that no cattle were on the runway, and made no gear check. The results you can see. A further disruption was the likelihood of other planes in the area practicing air-to-ground gunnery. Quite a few disruptions.

The pilot of this F-84 had to make a long, low approach as there were other airplanes performing above him at an airshow. He put the landing gear handle in the NEUTRAL position rather than DOWN. It wasn't until just before touchdown that he reduced power sufficiently for the gear warning light to come on. Tower personnel did not notice him since they were busy coordinating all performances and exhibition acts taking place at that time. Quite an exhibition!

GCA minimums

GCA IS NOT a zero-zero landing system.

It was not designed to bring you in when the soup is so thick on the ground you can't see your wingtips. It *has* helped pilots down safely under zero-zero conditions, but its working-day use is to guide the pilot into a position from which he can see the end of the runway and complete his landing visually.

The majority of accidents during ground controlled approaches occur when the pilot disregards the minimum GCA altitude when not in an actual emergency.

Seven recent aircraft accidents occurred under similar conditions when the pilots descended below GCA minimum altitudes without regard for their own safety or without proper consideration of their limited skill. These included accidents during practice approaches under the hood, during IFR conditions with ceiling and visibility above GCA minimums, and during approaches with weather below GCA minimums. The main contributing factor was the lack of proficiency on the part of the pilot.

Naturally, most of the pilot errors on GCA final approach come from flying too high or too low on the glide path. Some pilots who have been interviewed have the mistaken feeling that if they hold high on the glide path they can't hit anything. They finally fly so high above the glide path that drastic reductions in power or overcontrolling is necessary. This sometimes results in diving below the glide path and hitting short of the runway. Or when they do gain visual contact with the runway after holding too high, they have to grab for the ground too quickly with resultant high landing speeds or overshooting. It takes practice to be able to fly a steady glide path, and the most important elements are the use of power and flap settings to maintain a constant airspeed and correct rate of descent. Pilots who have made ground controlled approaches under actual IFR conditions day after day stress that it is highly important that flaps and power be set during level flight before the glide path is intersected; then merely change power as required to maintain the rate of descent. Experienced operators say flaps should never be changed after the original setting until the pilot is contact.

Pilots flying GCA sometimes have a tendency to ignore the altimeter. It is the pilot's responsibility to know when his plane has descended to the GCA minimums for the field. GCA minimums for the various Air Force and Navy fields as published in the Radio Facility Chart are the lowest at which a landing may be made except when the pilot declares an emergency. AF Reg. 60-16 states, "When upon arrival at the point of letdown, the weather is below the minimum ceiling or visibility authorized, the pilot will proceed to a suitable alternate." (A pilot possessing an instrument pilot certificate, AF Form 8A (green), can legally continue to descend below the published minimums at his own discretion.)

Times when GCA is unable to track aircraft because of adverse precipitation conditions are isolated and of short duration. Large, very wet snow flakes which usually turn into slush before hitting the ground, and intense rain consisting of large drops can cause excessive clutter on GCA scopes. Modifications made on receiving equipment, together with skillful use of receiver and indicator controls by GCA teams, usually result in obtaining sufficient contrast of targets to enable tracking through all but the most severe clutter, such as in the center of a thunderstorm.

Pilots have shown more and more confidence in GCA as indicated by the increasing number of approaches. In general, pilots are becoming more conscious of how and why GCA works and are therefore more critical of the infrequent errors made by GCA teams. This increased use of GCA results in bringing to light the need for changes in procedures and for improvement in equipment. It is only through long, continuous use under all conditions that some shortcomings can be discovered.

AACS groups check GCA operators and equipment in the field to determine their fitness. A GCA unit is not put on an operational basis during IFR conditions until fully trained operators are available for duty. The pilot is always advised if the operator working him is in training.

Operational experience of GCA units throughout the Air Force shows that GCA is capable of safe operation all the way to touchdown only when the pilots are proficient and the GCA crews are highly experienced.

CLEAR THAT AREA!

HAVE YOU ever heard the crunching and grinding of metal chopping into metal, or seen pieces of an airplane fly high into the sky as a whirling prop cuts it up? If you have, then you know the dread of having a prop from another plane cut into your plane.

Fatalities often occur, as in this case:

Two T-6's were taxied out for hooded takeoffs. Each had an instructor pilot in the front seat and an aviation cadet in the rear seat. The tower was off the air because of a power shutdown, and there was no emergency power for the Aldis lamp. An officer in the runway control truck was taking care of all traffic, and radio conversation was very cluttered with radio check calls. This officer had his hands full with answering radio calls, clearing the field, and performing other duties as runway control officer.

The first T-6 pilot swung onto the runway and rolled ahead for about 200 feet. This action was considered necessary to clear the area behind him for aircraft crossing the runway while taxiing in to the ramp, and also to let his student make a final cockpit check before starting his hooded takeoff.

Seeing this T-6 rolling down the runway, the pilot of the second T-6 pulled onto the runway and lined up. Because he had seen the prop of the first T-6 revving up as he taxied onto the live runway, he assumed that it was well on its way, and gave his cadet the word to start takeoff.

The cadet held the brakes until he had 20 inches Hg. and then started to roll. Shortly thereafter the left wing of the second airplane struck the empennage of the first one. This swung the second T-6 right into the fuselage, with its prop cutting through the rear cockpit. The cadet in the rear cockpit of the first T-6 was killed, one airplane was completely wrecked, and the other sustained major damage.

It is standard procedure at this base for pilots to take off at their own discretion, but it isn't SOP to take the runway before the airplane ahead is airborne. To all witnesses it appeared that the two T-6's were planning a formation takeoff, so that gives you an idea of how close together they were.

This base now has a project under way to provide storage batteries in the tower for emergency operation of the Aldis lamp during periods of power failure in the tower. Also, it is planned to install emergency power for the radio equipment.

But would all this have done any good in this case since the T-6's looked as though they were making a formation takeoff?

Both the instructor pilot and the aviation cadet in the second airplane were flight checked to see if they had any aversions to flying after the accident and both were returned to flying status. Their judgment and technique were considered average or above for their respective experience. However, it seems that a meter is needed for measuring the degree of carelessness which a pilot might achieve.

One point which can be made in defense of this instructor pilot is that he had been flying quite a bit with students during the preceding three days, 16 hours in fact. A lot of this time was at night. At the investigation, the medical member of the board conceded that this pilot might have been suffering from fatigue.

Flying Safety MOVIES

IN AN EFFORT to intensify its accident prevention program, the Air Force in the near future will release four motion pictures on subjects which have proved particularly troublesome to pilots. Arranged on these pages are production stills from the films which were shot this spring at a southern Air Force base.

Chosen because accident records in Flying Safety Division showed them to cause many unnecessary accidents, subjects in the films cover taxiing accidents, poor flight planning, lack of instrument proficiency, and violations of regulations. In the same order the titles are "Charge it to Uncle," "No Margin for Error," "It Can Happen to You," and "Sixty-Sixteen."

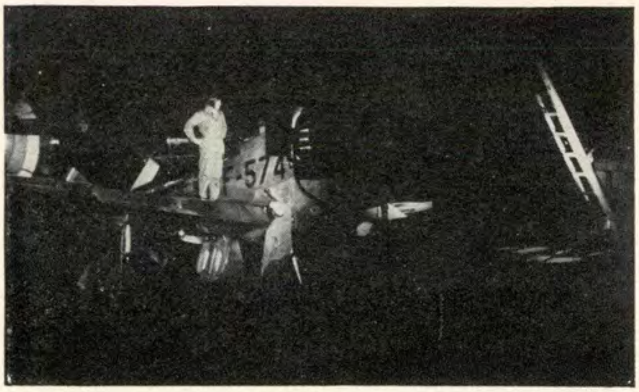
The motion pictures were written and produced for Air Force pilots, and all parts were played by Air Force personnel in current equipment. Technical supervision for the civilian contract producer was supplied by representatives of Flying Safety Division during preparation of the scripts, on location, and during editing and cutting phases.

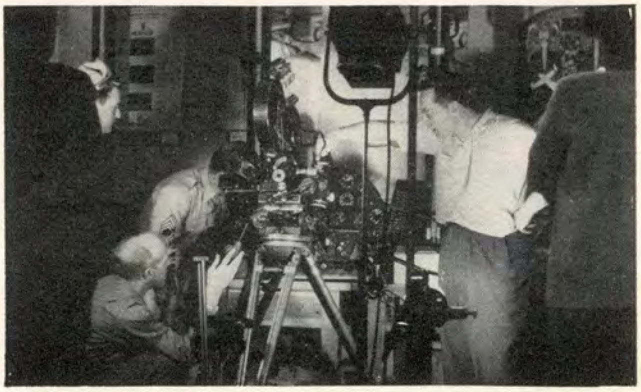
"Charge it to Uncle" is the story of a hapless pilot who is plagued by the inability to taxi correctly. What he does to the Air Force and what the Air Force does to him will furnish a valuable lesson to all pilots, and at the same time afford an interlude of entertainment.

"No Margin for Error" depicts the trouble pilots can invite when they fail to plan flights properly. This film brings to the screen for the first time Major Rex Riley, Flying Safety's famous comic-strip-type poster character. He'll point out many of the errors in flight planning which can get the careless pilot into deep trouble.

"It Can Happen to You" takes you on an instrument flight that nearly ends in disaster. It will show how lack of proficiency on basic instruments can cause premature gray hair as well as a premature arrival at the pearly gates.

"Sixty-Sixteen" hits upon one of the most dangerous habits of thoughtless and foolhardy pilots—viola-





tions of air traffic rules. With many dramatic moments, this film will offer proof that you are playing a losing game when you disobey the laws.

Present plans call for an early distribution of the films to Air Force bases in the continental U.S. and overseas. It is planned that they will be used in connection with semi-monthly flying safety meetings required for flying personnel.

In preparation now at Flying Safety Division are program instruction guides on the same subjects as the films. They are designed for use by flying safety officers in presenting a full hour flying safety meeting along with the films. The safety pictures average 10 minutes in length.

Actual release date and distribution plan for the films will be announced in this and other Flying Safety publications. Be sure to watch for these motion pictures which represent a new approach to flying safety indoctrination. We believe you'll like them.

MEDICAL SAFETY

THIS IS the first in a series of articles on aero-medical aspects of jet propelled aircraft. The material in these articles was prepared by the staff, Aero-Medical Laboratory, Engineering Division, Air Materiel Command.

NEW FIELDS OF RESEARCH

To the flight surgeon with experience in World War II, modern jet aircraft have introduced operationally no new principle or care-of-flier problem that did not exist previously in some form for the conventional F-47 and F-51 fighters, and for the B-17 and B-29 bombers.

Jet propelled aircraft have made routine many operational conditions considered as special cases during the last war. For the older aircraft, operational flights above 30,000 feet were only occasional; for the jet type, such flights are routine. For the older fighters, speeds up to 600 mph were possible only in steep dives, but for the jets such speeds in level flight are routine. During the past war, the only pressurized aircraft used in service were the B-29 and the C-69. Today, all jet aircraft are pressurized.

The most strikingly new field of aero-medical research and development introduced by high-speed and high-altitude jet aircraft is the problem of emergency escape. In evaluating the human design requirements for an ejection seat, it has been necessary to study human tolerance to very high G forces acting for short periods of time. Similar forces have been observed before in aircraft crashes, ditchings, and in high-altitude parachute-opening shock. The ejection seat program has caused indirectly a complete revision of the concepts of human tolerance to short-time high G forces, and has resulted in an entire change of thinking in this important field.

A second new postwar field of research is what has been re-discovered and re-named as "human engineering." During the past war the Air Force pioneered the use of anthropometry in sizing cockpits, gun turrets, and escape hatches. Physiological and biophysical principles were used to define human requirements for pressurizing and air conditioning aircraft cabins. In the literal sense, all this was and still is human engineering.

However, in its newer usage, human engineering covers primarily the psychological relation of man to his machine. Psychological engineering has made its greatest contribution in establishing new requirements for design of flight controls and flight instrumentation. For jet aircraft, where the tempo of flying, navigating and landing is greatly accelerated, the effectiveness of a flight control or instrument may spell the difference between success or failure of a mission or be the deciding factor in flying safety.

A third new postwar field of aero-medical research is that of ultrasonics. When jet aircraft were first introduced, this form of sound was thought to be a significant flight hazard. Since that date, the entire sound spectrum occurring during jet flight has been analyzed and re-evaluated biophysically. It has been shown recently that the real sonic hazard may come from the lower subauditory frequencies rather than from the so-called ultrasonic.

The following brief summaries present some of the aero-medical problems arising today from the use of jet aircraft.

OXYGEN REQUIREMENTS FOR HIGH-ALTITUDE FLIGHT

Physiologically, when 100 per cent oxygen is breathed without pressure, a pilot's performance is subject to increasing handicap above 40,000 feet (141 mm of Hg. pressure). Above 40,000 feet, an ideal pressure-demand oxygen system should maintain a 40,000-foot "equivalent oxygen altitude" by supplying oxygen under pressure. A breathing pressure of 29 inches of water (54 mm Hg.) is required at 50,000 feet to maintain this 40,000-foot "oxygen equivalent." High breathing pressures at this level can be used even with respiratory aids by thoroughly indoctrinated individuals for periods of only four minutes before onset of nausea, diaphoresis (profuse perspiration), and impending syncope (swoon or collapse). At pressures of about 20 inches of water, the duration of the symptom-free period is lengthened to approximately 12 minutes.

In actual practice, when using pressure breathing above 40,000 feet with the standard A-13 pressure-demand oxygen mask and the A-14 pressure-demand regulator, a compromise solution must be sought in which a certain degree of hypoxia (deficiency of oxygen in the inspired air—anoxia is deficiency of oxygen in the blood) is accepted in exchange for a gain in altitude. The minimum breathing pressure at which oxygen must be delivered to maintain useful consciousness for at least one minute at 50,000 feet, and then to permit safe descent to 10,000 feet at a rate of 10,000 fpm, is 14 inches.

A small group of subjects were thoroughly indoctrinated in the use of pressure-demand equipment, and a number writing test was used to measure the degree of hypoxia present. Results indicate that there is one important limitation imposed by present pressure-demand oxygen equipment; the difficulty of holding more than 14 inches' water-mask pressure without pressing the mask tightly against the face with the hand.

From a practical point of view it is felt that operations above 40,000 feet should be undertaken only within the confines of a pressurized cabin and that the increasingly high breathing pressures required to maintain useful consciousness from 40,000 feet to 50,000 feet should be used only in emergency loss of this cabin pressure.

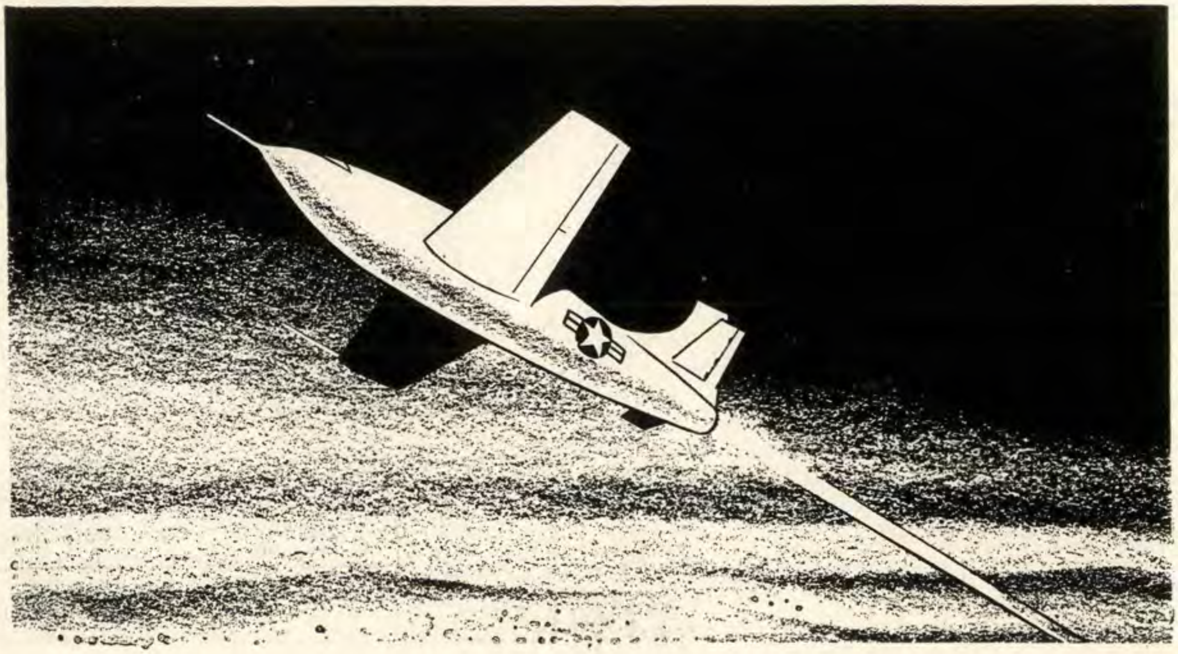
OXYGEN EQUIPMENT FOR JET AIRCRAFT

The pressure-demand oxygen system consisting of an A-13A mask and an A-14 oxygen regulator, the use of which was pioneered by Air Force photo reconnaissance units during the last war, is now the standard oxygen installation in all jet aircraft. This system has two advantages over the conventional demand oxygen system used as standard during the past war. First, it provides a positive safety pressure and eliminates inboard mask leakage when used in the 30,000 to 40,000-foot range. Secondly, it provides an emergency pressure breathing source of oxygen for use up to 50,000 feet.

The entire oxygen installation, as used today, is practically the same as used at the end of the last war.

The pressure demand mask itself is issued as personal equipment. The present bailout system, type H-2, consists of a non-shatterable high-pressure cylinder. The oxygen flow is led into a "T" connection at the disconnect end of the mask tube. This connection is check-valved and orificed so that 10 to 12 inches' positive pressure is applied to the mask on the initial flow of oxygen. This is started by pulling a cable leading to a break-off nipple at this cylinder.

Plans for a future design of the pressure-demand system include greater mask comfort, integration of the pressure gage and flow indicator with the pressure demand regulator, and automatic control of both the air-oxygen ratio and the mask breathing pressure with changing altitude. In addition, the entire system will be designed for panel mounting for easy removal and for test or repair.



AIRLANES on the AIRWAYS

IT HAS been said that when a pig is butchered, everything is used except the squeal. To many pilots, it seems that the squeal has been utilized too by applying it to aircraft radios, especially Channel A on an IFR day when numerous people are chattering.

This is just one of the problems of air traffic congestion that confront pilots on IFR flights in these times. Other pilot complaints include the delays frequently experienced in getting Air Route Traffic Control clearances for IFR flights, and the necessity for assigning an altitude several thousand feet higher than the one requested. Steps are being taken to alleviate these problems.

Within the next five years you should be able to file an IFR flight plan, taxi out and take off without any delay. Position reports will still be made on a common channel such as A, but you will receive on a VHF omnirange frequency which is not blocked by several other pilots trying to make position reports.

The VHF omnidirectional range, or the VOR as it is popularly referred to, is essentially the backbone of this new system.

Frequencies of the omnirange will vary from 108 to 132 megacycles. This immediately does away with the big headaches of low-frequency radio—precipitation static and night effect. But we must remember that VHF *is* line of sight and it will be possible sometimes for a mountain to block out reception of the omnirange. However, such cases will be rare because of the strategic locations of the ground stations.

Basically the omnirange has three uses. It enables a pilot:

1. To fly *to* and over a station or point.
2. To fly *from* a station or point.
3. To get a fix.

The omnirange has five loop antennas. A combination of the center one transmitting voice, and a reference signal with a rotating field transmitted by the remaining four forms a pattern resembling the spokes of a wheel. The aircraft equipment actually calibrates this pattern for its own use into 360 spokes of one degree each.

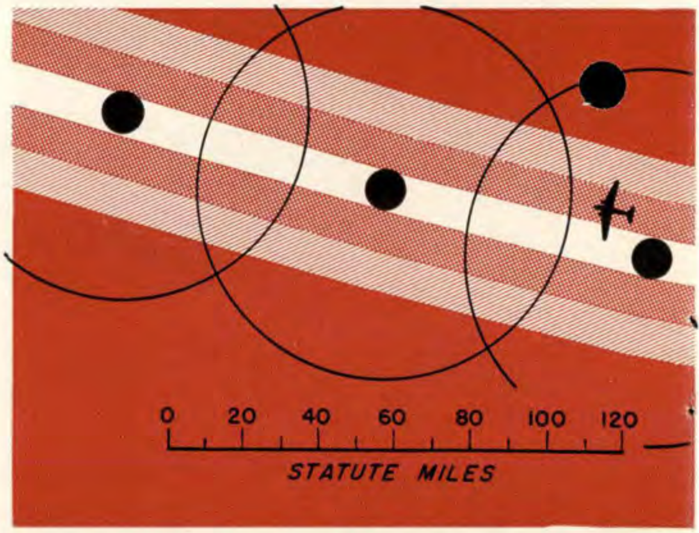
Identification signals are received in Morse code from the omnirange station just as they are from the low-frequency stations now in use. In rare cases, such as experimental stations, voice identification will be used.

As reported in the March 1949 issue of FLYING SAFETY, there is considerable airborne equipment associated with and necessary to fly the omnirange. The total weight is approximately 100 pounds.

This includes an automatic direction finder similar in presentation to the present radio compass, a frequency selector, a cross pointer indicator similar to the present ILAS indicator, DME (for measuring the distance from the airplane to the station), and the course line computer.

The DME and computer are going to be a big help in easing traffic congestion plus enabling a pilot to determine his exact location at all times.

First of all, the airborne equipment must initiate the proper phases of a signal to interrogate the ground station. The ground equipment replies to each proper interrogation pulse. The airborne interrogation equipment thus measures the time required to transmit the pulse and receive a reply. This time in microseconds is converted by the DME to distance from the station in miles.



To insure against interference from another omnirange using the same frequency, different pulse rates are used on the two stations—thus the interrogation equipment can differentiate between them.

As far as several planes interfering with each other when using their DME on the same omnirange, the various airplane transmitters are slightly out of synchronization with each other. Thus as many as 100 airplanes can be using the same station without saturating it or getting another plane's replies from the ground station. If more than 100 airplanes are using the same range, only the 100 closest aircraft would be able to get a usable signal.

Let's study the principles of omnirange flying as applicable to traffic control. The basic omni equipment allows smaller aircraft and private fliers to fly right over the omnirange stations on the center airway.

Yes, there can be several parallel airways, all using the same omnirange stations.

Military and commercial airplanes with complete sets of airborne equipment can fly in an airlane up to about 60 miles on either side of a line of omniranges. In other words, the airways will be similar to a four, five, or six-lane highway. One can see from this that there is a possibility of two or more airplanes flying along the same airway at the same altitude but in different lanes, say 12 miles apart.

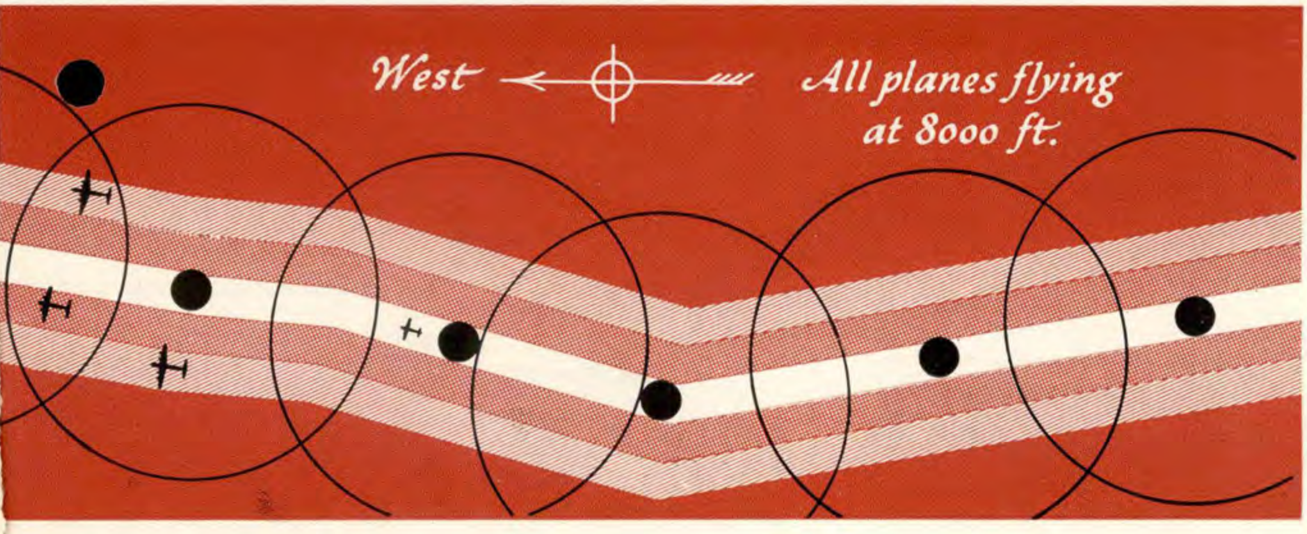
The CAA Experimental Station at Weir Cook Airport, Indianapolis, reports that its pilots have flown tracks 50 miles from the station with accuracy.

How can you fly a track some 10 to 50 miles to either side of the omnirange and stay in your lane? First of all, you will need some information from a regular map. Incidentally, it is planned that maps in the future will have compass roses around the omniranges for quick and easy calculations of fixes. Say you are 30 miles NW of an omnirange and want to get to a point 30 miles NE of the range without flying over the range. You will need to know the course and distance from the range to the point 30 miles NE. You set this information into the computer. All additional data for flying the track is received from the omnirange via the distance measuring equipment. Then the course you must fly to make good your proposed track on the ground is supplied by the DME and computer, and the distance from destination point is constantly presented. All the pilot has to do is to turn the knob on the course dial to correspond to the course his radio magnetic indicator is presenting and thereafter keep the cross pointer meter centered.

Checks can continually be made of your position in relation to the ground station, and wind can be figured by using a variation of the back side of the E6B computer. However, the omni computer corrects your course automatically for the wind.

CAA is installing omnirange stations to give almost complete coverage of the United States. Many of these are in operation now, and several more will be in operation by the end of this year.

This method of easing traffic congestion will mean that USAF pilots will have to fly the airlanes and not go direct in IFR weather. But the time saved in getting clearances plus the advantage of knowing your exact location in the soup and the assurance of spacing between aircraft should more than compensate for the extra few miles you have to fly to go airways.



—WHY

WHY DO pilots buzz? Is it because they get a feeling of superiority out of flying near stationary objects? Is it because they enjoy doing that which is forbidden? Or is it just the thrill of flashing over the land and by obstructions at high speed? Whatever the cause, buzzing contributes an unnecessary addition to the accident rate.

During 1948 there were 74 official reports of buzzing or unauthorized low flying by Air Force planes. Twenty of these cases resulted in major accidents which claimed the lives of 11 persons, some of whom were innocent victims of a pilot's whim.

For instance, a flight surgeon was in operations when a pilot came in to file a clearance. Since the pilot was going alone in a T-6, the flight surgeon asked that he be allowed to ride the back seat. The pilot was willing.

After he had been flying for about 30 minutes, the pilot decided that flying at altitude was not for him. He probably chuckled to himself as he was struck with the idea of buzzing a farmer on a tractor, and down he dived on the innocent soul astride the iron mule.

As the plane passed not more than 10 feet above his head, the farmer jumped from his tractor and lay prone upon the ground. Then he stood up and started shaking his fist at the pilot. "I can't let a farmer get away with that," the pilot probably thought to himself, so around he came again—lower. No doubt, all this time the flight surgeon was shaking in his boots and pleading with the pilot to take him back to the field. But his pleadings were ignored. On the second pass the pilot failed to pull up in time to prevent a wing from clipping a tree. The plane struck the ground in an inverted position and was demolished. The pilot and his passenger died as a result of the crash and the Air Force received a black eye.

We know why one pilot decided to buzz his home. As he was leaving to go to work one morning his wife remarked that he had never flown over the house. He resolved to do something about that before the day was over.

After obtaining an F-47 for a local flight, this pilot headed straight for home. He made a few relatively low passes at less than 100 feet. Then his wife came out in the back yard and waved. He decided to give her a thrill of a lifetime. He dived down, down, down right toward her until it looked as if the plane would strike the exact spot where she was standing. Suddenly he pulled back on the stick but the plane continued downward. It passed only a few feet above the pilot's wife and struck the ground. A wing hooked a tree and the plane cartwheeled as the pilot's wife stood terrified in her tracks. The pilot paid the maximum penalty and his wife must also suffer for his actions.

"Killed while buzzing. Not in line of duty." Harsh words you may say, but they are stamped on many such case reports. The members of a pilot's family must suffer because of his foolhardiness. Again, why do pilots buzz?

One pilot who was lucky enough to escape with his life tells why he buzzed and tried a slow roll in

BUZZ ?—

a T-6 practically on the deck. "I was in the mood for showing off," he said after he struck the ground in an inverted position. "I had been showing off. Stupid thing to do, but I was in the mood."

When such accidents occur they put the Air Force in a bad light. "Waste of valuable equipment—endangering needlessly the lives of innocent people," is the way editorial writers put it. And they are justified.

Why do pilots buzz? Two reasons have been given already. Someone dares them, or they are just in the mood. There must be other reasons.

For example, when a pilot passed near his home in Virginia, he decided to fly over his parents' house and let them know that he was back east. When he told his copilot that he was going down and buzz the old homestead, the copilot reminded him that he shouldn't. "Someone might report you and then you could be kicked out of the Air Force. I don't want that to happen to me."

"I know everybody in this valley," was the pilot's reply. "These people wouldn't report me. I buzz the place every time I'm out here. They get a kick out of it."

"O.K. It's your neck. But remember that I warned you."

A few days after returning to his home station, this pilot was called in for a little conference with the "old man."

"Captain, you flew one two-two on the eighteenth didn't you?" the colonel asked.

"Yes, sir."

"Where did you go that day, captain?"

"To Bolling, sir."

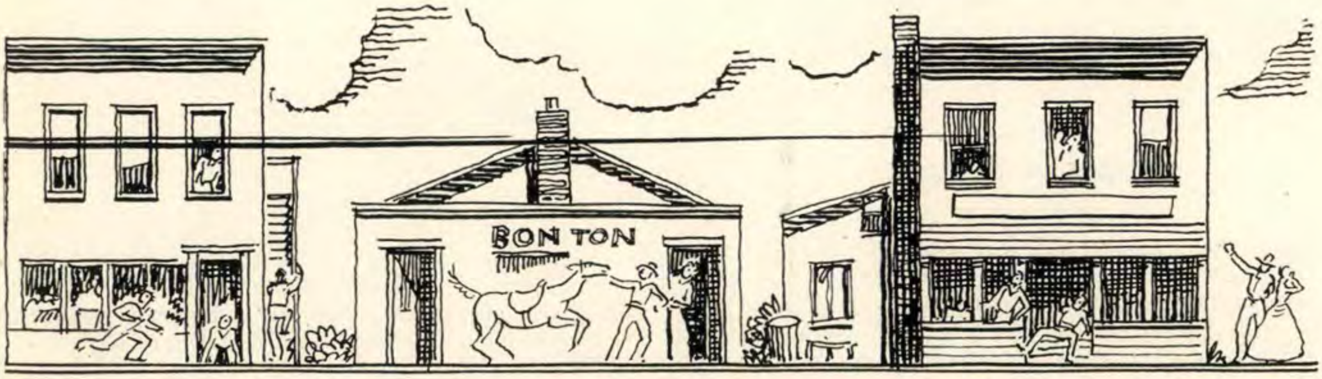
"I have a little report here—" the colonel stopped there to study the reactions of the pilot. The captain could hear the rumble of the drums as the guillotine was made ready. He knew that some stinker had reported him for buzzing.

"There's always one in every crowd," he said to himself.

The colonel could see him start to squirm and redden. "This report says that you were flying low in the vicinity of Fanhill, Virginia," the colonel continued. "Do you have an explanation for your actions?"

The pilot admitted all and was suspended from flying and fined one hundred dollars per month for 12 months.

You may be lucky and get away with one or two good buzz jobs. On the other hand, getting away with one or two only leads you to believe you can continue to do it without being detected or reported. Don't you believe it. Those big numbers printed on the fuselages of Air Force planes are there for a reason, namely, they are easily read from the ground. If you can't think of something better to do than buzz, land your airplane and get away from it before you get into trouble. The penalties for buzzing, if you live, are becoming more and more severe. The next time you feel in the mood for showing off, stop and ask yourself this question, "Is it worth it?"



TAKE A SNIFF

A SENSE OF SMELL is not a requisite for physical fitness of pilots but perhaps it should be.

The Flight Safety Foundation reports that the sense of smell can be tested easily by wafting an opened package of cigarettes in front of a blindfolded pilot. Out of curiosity, FLYING SAFETY tried it on a group of pilots. One reported that the smell was soap, another said figs, another thought he smelled some kind of perfume, and others recognized tobacco.

In the light of the large number of reported "smoke" conditions in aircraft, it might prove an added safety measure for pilots to put in a little nose time learning to distinguish between different types of smoke—hydraulic fluid, fabric, rubber insulation, etc. The nose is regarded as a very reliable fire detector on shipboard where sniffing tubes lead to cargo compartments.

FOWL CENSUS TAKER

What is considered the first accurate census of waterfowl was taken recently by the pilot of a Shooting Star of the 12th Recon Squadron at March AFB.

The plane was equipped with a special Sonno aerial camera and was able to sneak up on the birds on lakes and streams and photograph them before they became aware of the plane's presence. Lack of sound ahead of the airplane made this possible.

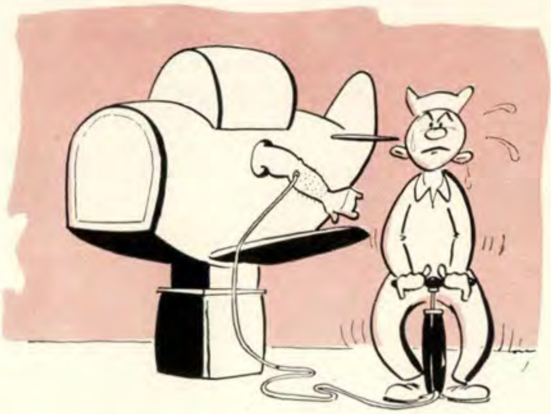
SNOW IN THE LINK

Ever wonder how the use of drugs or stimulants affects your flying skill? The Naval Medical Research Institute is at present conducting a series of experiments to determine the answer to that question.

Experiments are being made with the use of the Link trainer. "Guinea pig" pilots for the tests are six enlisted men who had no previous flying experience before being taught to operate the Link.

In addition to testing most of the common stimulants, the effect of seasick pills and amphetamine (synthetic powder containing benzedrine) is being examined. New Link electronic scoping and recording equipment is being utilized to test the capabilities of the pilot before and after administration of the drugs.

Information gained from the study is expected to have considerable value for flight surgeons who might prescribe medicine for a pilot which contains the drugs being tested.



THERE IS A DIFFERENCE

Initiating a program to improve weather services in non-scheduled flying by encouraging civilian pilots to report differences between weather forecast and weather actually encountered, Flight Safety Foundation recently distributed to company and individual owners of aircraft 2000 Weather "Encountered" report cards. The program has the support of the United States Weather Bureau which will act on the reported discrepancies.

The cards, to be filled out by pilots, compare the station forecast or report with the actual weather encountered. Pilots are also encouraged to radio back in-flight reports of weather conditions, and space is provided on the cards for noting to which station this information was given.

THE BIG RACE

THE ILLUSION has been shattered that the war's end would mean the end of the astonishing wartime progress of aviation. Anyone who still entertains this thinking—"let's relax, military flying has settled back to a pre-war regularity"—is in danger of being left far behind.

World events and the farsightedness of scientific, government and military leaders have dictated that aviation cannot stand still or fall back. This country has diverted its driving energy from wartime mass production to a still greater upsurge of technological advancement. Aircraft development has entered an accelerated transitory stage which in all probability will not slow down for many years. Development of instruments and navigational aids has been similarly affected.

This period of accelerated technical advancement has confronted the Air Force and *every individual pilot in it* with a challenge to match this scientific progress with human advancement. The big race is on.

Air navigation is now on the threshold of a period of advanced development which portends achievements undreamed of a decade ago. The whole technique of airways navigation is in the midst of a complete change. Mr. D. W. Rentzel, Administrator of the Civil Aeronautics Administration, has predicted that the omnirange and distance measuring equipment will become the air navigation standard by 1954. Besides this new basic system of navigational aids there are many more developments on the way: more sensitive altimeters, better radios, more complete radar equipment, highly improved GCA and ILS systems, and a multitude of other aids.

This surge of progress in the development of better equipment places the Air Force right in the middle of the big race to match scientific progress with greater personnel efficiency in order to utilize this new equipment to full advantage as it becomes available.

Formal training of all pilots in the use of these new aids cannot be accomplished in one sweep, since it is impossible to recall all pilots from their assignments and send them off to schools. Here, then, is the point at which the individual pilot can assume a vital role in the race between technical progress and human skill.

Every single pilot in the Air Force can conduct his own personal training program.

You can't get actual flying experience and instructions from a pamphlet, but you can acquire a basic understanding of the workings of new equipment. Suppose that every pilot took an instruction booklet on each new instrument procedure and radio navigational aid home one night a week for 10 weeks and studied it for two hours each of those 10 nights. The Air Force would have acquired some 560,000 man hours of instruction!

Of course, this home instruction will not prepare the pilot for all conditions of actual flight, but he will undoubtedly be better equipped to begin using the new equipment in the air as it becomes available. Instruction booklets will be available to all who seek them as new equipment is made operational.

Let's apply this personal training program to subjects other than new equipment and procedures. Take the subject of actual flight conditions. There has been much discussion and argument on the subject of instrument card qualification requirements. Men who wish only to pass the bare minimums required by regulation will not benefit as much from any instruc-

tion as those who study and practice instrument flying willingly and at each opportunity. The pilot who has to be required by regulation to learn is not only a poor pilot, but has little pride in his profession.

Let's take a look at what can be accomplished by pilots who are enthusiastic about improving their instrument flying.

In August 1946, the All-Weather Flying Division set up a series of flights between Washington, D. C. and Clinton County AFB, Ohio. The purpose of these flights, which continued through September 1948, was to determine the reliability of an all-weather flying schedule. All flights were made on instruments. Commencing 1 October 1946, the following schedules were set up: take off at Clinton 0900, land at Andrews 1100; take off at Andrews 1300, land at Clinton 1500. Allowable tolerance in these schedules was plus or minus one minute. Of the 1052 flights made between the two stations, 79 per cent were completed on schedule. That is a high average, and the majority of flights not completed on schedule occurred in the early months of operation —before the pilots became accustomed to the operation.

This operation was more or less in the vein of experimentation. However, there is a more recent example of its practical use. That is, of course, the Berlin airlift. All of those flights were made under instrument flight rules. There is no need here to delve into statistics; the accomplishment speaks for itself. There can be no doubt that the pilot who completed a six-month tour on the airlift emerged a better instrument pilot.

There are numerous routine local, 60-2 and administrative flights made today on which pilots could improve their instrument flying. The majority of these flights do not call for extreme haste in getting back on the ground, but in many cases the pilot seems to think that such is the case, and passes up the opportunities to practice range letdowns and GCApproaches. As illustrated by the all-weather experiment and the airlift example, practice and experience are the best teachers, and every pilot should remember this when given an opportunity to improve his instrument flying.

If every routine cross-country flight made today under CAVU conditions were made under instrument flight rules, a lot of valuable experience would be gained. Extra training that you give yourself in your personal training program will inevitably become a credit to you as a pilot, and more important, it may save your life in a tight spot some day. As was pointed out in the Instrument Story, published in FLYING SAFETY, June and July 1949, the development of "blind" flight owes much to its pioneers. Every pilot who sits behind a stick today is in every sense a pioneer in the utilization of new aircraft and equipment. By making full use of his constant opportunity to increase his individual proficiency, each pilot plays his part in the big race between technical progress and human achievements.

The airplane and the instrument have come a long way since the Jenny days. So has the pilot. Each new year will see new and better instruments and equipment. Whether the Air Force derives full benefit from these advancements rests largely in your hands as an individual. Instruments may not appear on that set of silver wings, but they constitute the clasp that will sustain those wings in an all-weather Air Force.

—The Editors.

★ Cross Feed

FLYING SAFETY IDEA EXCHANGE

INERTIA REEL LOCK

Complaints have reached FLYING SAFETY that pilots flying the F-86 are having to use back cushions so that they can reach some of the controls in the forward part of the cockpit. They are reluctant to leave their shoulder harness in the unlocked position during takeoffs and landings to allow them to lean forward to reach these controls.

This reluctance and some of the difficulties would be alleviated if pilots were made cognizant of the inertia reel lock incorporated into their shoulder harness. This inertia lock, located on the back of the seat, operates to lock your shoulder harness automatically when an impact force of two and one-half G's is reached. This impact force causes a ratchet-like affair to drop down into slots on the reel which pays out your shoulder harness. This ratchet locks the shoulder harness in its position at the time of the two and one-half G impact.

With this inertia reel lock it is possible to make your takeoff and landing with the shoulder harness lever in the "unlocked" position with the assurance that your shoulder harness will lock and hold you from smashing into the instrument panel in the event of a crash. It might also be pointed out that this inertia lock can be rearmed simply by repositioning your lever on the side of the seat. Maintenance personnel should be certain that this lock is kept in perfect operation because the pilots' lives depend upon its proper operation.

The inertia reel lock is currently being used on F-80's, F-84's, F-86's, B-50's and B-45's.

DANGER

It is not practical to keep constant patrols in the air over danger areas to chase stray airplanes away from bombing or gunnery ranges.

It is hazardous for pilots to violate danger areas by flying through them. For example, bombing activities from all altitudes as well as rocket firing are quite extensive at Aberdeen Proving Ground, Md. Flares of all descriptions are also being dropped in delayed parachutes.

POSTERS

A RECENT Pacific ditching disclosed the need for more and better briefings of crew and passengers for overwater flights. Luckily in this case, most of the occupants survived. However, later investigation revealed that the plane had departed with little or no briefing of crew and passengers on what to do in case of an emergency landing on the water.

A lot of ditching posters appearing on the walls in operations could be put to additional use in transport and bomber aircraft. These illustrations of how to evacuate the airplane and what to take with you could be posted in a conspicuous place in the interior of the cargo and crew compartment where everybody could see them. Then the occupants of the plane would know what to do when the alarm bell rings and they start getting their feet wet, even if they had slept through a briefing.

Streetcars, buses, and subways are covered with posters and advertisements. If millions of dollars are spent for advertising of that nature, then someone must look at them. Why shouldn't the passengers of transport airplanes do the same thing? Why be half safe?

Capt. R. D. Littlejohn
Capt. Paul W. Eckley
Hqs ConAC

DIRTY WINDSHIELDS

There cannot be too much emphasis placed on the pilot's responsibility toward reducing the aircraft accident rate in the USAF. It appears, however, that increased emphasis should be placed on the responsibility of the men on the ground—the men who maintain and service the aircraft.

There is a tendency on the part of the servicing crews to consider "the mission accomplished" when a transient airplane has been refueled. Although we all admit a dirty windshield is a hazard to flight, especially at night, I have yet to see, since the days before the war, a service crew voluntarily clean a windshield.

The following is a typical example of indifference on the part of servicing crews in this respect. On a recent proficiency flight, struggling to get in my minimum annual requirements, I flew all day and landed at one of our major Air Force bases. The refueling unit pulled up and I filled in the form, requesting gasoline and oil *and* "please clean the windshield." On the last takeoff, we had climbed through a swarm of bugs and they were splattered all over the place.

As we checked in at operations, I noticed the individual who had met our airplane when we landed. I took the time to speak to him and to mention that we would be on the ground about two hours, that we were having dinner at the officers' mess and planned a night flight back to home base. I asked the airman to be sure to check on the windshield, as it was pretty dirty and we were flying back after dark.

We arrived back at the airplane about 15 minutes before sunset. The windshield had not been touched. Using one of my best Christmas gift handkerchiefs and all the saliva I could muster (slightly chocolate colored from the dessert we had for dinner), I managed to spread the bugs a little thinner.

Needless to say, visibility on the return flight was somewhat restricted. This was not only extremely aggravating but, as far as I am concerned, a hazard to safe flight.

It is suggested that Flying Safety officers discuss the dirty windshield hazard with the base servicing crews. It is further recommended that "wiping the windshield" be SOP for transient aircraft in addition to refueling. Suitable equipment, in the way of clean rags and cleaning liquid, should be a standard part of all refueling units.

A little box of paper towels, clean rags and a bottle of window cleaner, with spray attachment, would do the trick nicely, conveniently and economically. Of course, someone would have to *use* the equipment until such time as it can be accomplished by waving a magic wand—which would be nice.

Col. John M. Schweizer, Jr.
Headquarters USAF

ENGINE PRESSURE VALVE TESTER

A contribution to safe flight has been invented at Pope Air Force Base by T/Sgt. Leroy A. Martin and Mr. R. D. Cooper, civilian employee.

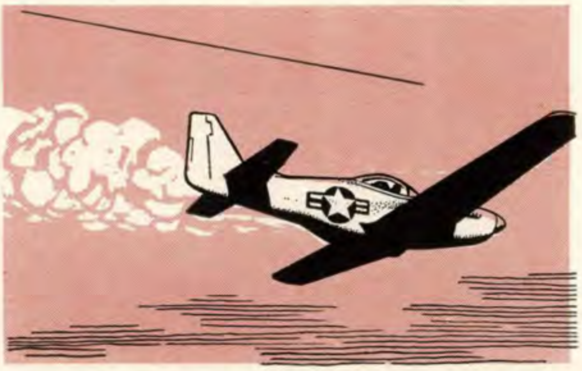
After long and patient experimenting in the engine buildup shop, Martin and Cooper devised a machine to test pressure valves in liquid-cooled engines to insure their adequate performance before being installed in airplanes.

According to the two inventors and other technical experts, the pressure valve tester will eliminate many possibilities of airplane engine failures due to malfunction of the seemingly unimportant little valve.

They are both of the opinion that many liquid-cooled engine failures are due to the pressure release valve's not releasing, which causes an excessive amount of pressure to be built up in the engine, forcing the seals to expand and allowing the liquid coolant to flow through the gasoline blower system.

Several months ago an F-51 made a forced landing because of engine trouble. The pilot noticed a white smoke coming from the engine. When the valve was taken out during investigation it was found to be stuck. The stuck valve could have easily caused a crash. In three other engines that failed, Martin and Cooper found the valves stuck.

The valve tester is used to exert pressure against the valves. If the valve is working right, it will release under 30 or 40 pounds of pressure. If not, adjustments are made on the valve to insure its normal release. Heretofore, there was no known method of testing these valves. However, pressure valve testing with the new instrument is now incorporated in every 90-hour inspection of every liquid-cooled engine at Pope.



Violation!

As ALL PILOTS should know by now, although this accident indicates otherwise, AF Regulation 55-13 has ruled out the old tactical approach. The days of the dive-and-zoom landing pattern are over. Experience has taught us the safe way to make an approach and to fly a traffic pattern.

Let's review 55-13 a little and compare it to the way a "hot-rod" recently made his approach.

First of all, it says, "360° overhead approaches will be made only when authorized by the control tower operator at the airport being utilized."—This hotrod didn't even have contact with the tower except for a green light which he had received. He had rocked the wings of his F-47 in acknowledgment of this green light.

Next the Reg says that "radio contact will be maintained with the control tower throughout the approach." Obviously he couldn't receive the tower so this part was out. But, let's go on. It reads, "and the initial approach will be established at a minimum distance of two miles from the end of the active runway and maintained at not less than 1000 feet altitude above the ground."

This pilot made his approach at approximately *400 feet* above the airport.

Then the Reg states, "The peel-off or breakaway will be executed without gain in altitude." Guess what our boy did? Yes, he zoomed way up to kill off his speed so he could lower the gear.

Then comes the payoff paragraph of AF Reg 55-13 —"The last turn onto final approach will be completed at a safe altitude and not less than 1000 feet horizontally from the approach end of the runway."

The runway Hotrod was approaching so vigorously was a 3200-foot job with obstructions on the approach end. In violation of the reg, Hotrod was cocked up in a 70° bank 1000 feet from the approach end of the runway, still 30° from the runway heading. And what he considered a *safe* altitude was approximately 100 to 150 feet with that angle of bank.

As a result, he crashed about that time and splattered one F-47 around an area 265 feet long and over 100 feet wide. The engine tumbled 180 feet when it separated from the fuselage.

Hotrod miraculously crawled from the wreckage unassisted, but a little dazed and quite a bit wiser, no doubt, on how not to fly a traffic pattern. No information is available yet as to disciplinary action by Hotrod's CO but we're inclined to believe he is acquainted with the contents of AF Reg. 55-13 by now!

WHY?

IT MIGHT be said that the pilot of this F-84 was the victim of circumstances.

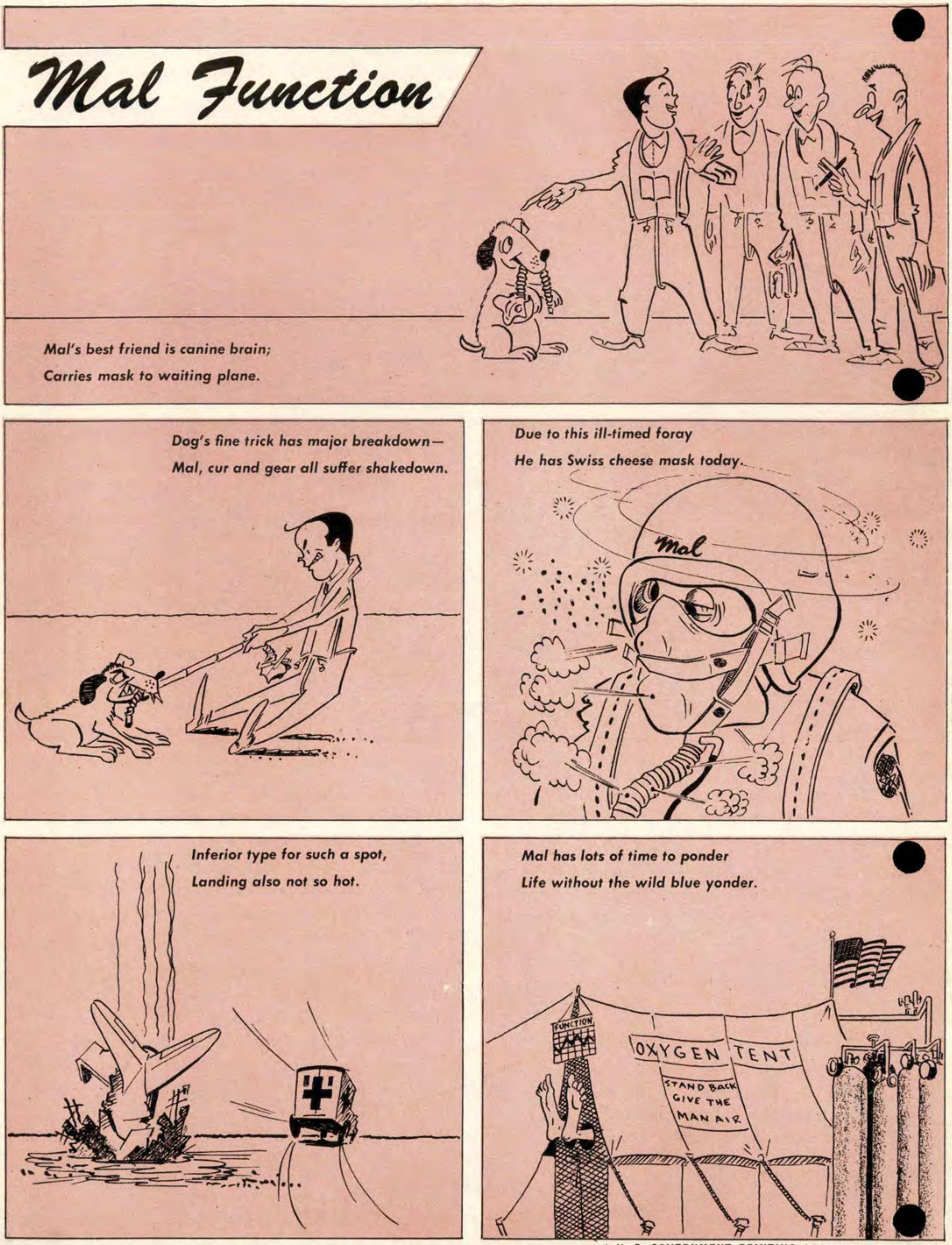
For easier story-telling let's call him Vic Tim. Now Vic was No. 5 of seven planes scheduled to take off. After the No. 4 pilot started his takeoff run, Vic made a turn onto the runway and in 10 or 15 seconds started to roll. When he had about 110 mph airspeed the tower operator advised all aircraft to hold their positions, followed by, "Plane on takeoff roll, stop your takeoff."

Vic cut his power immediately and applied brakes.

To complicate things further a fire truck was speeding along an intersecting runway toward the No. 4 plane which had developed friction fires when the pilot aborted takeoff and bellied in.

The fire truck driver came to a stop at the edge of the active runway and looked toward the takeoff end. He said later he "apparently saw nothing coming." The volume on the truck's radio was turned down, so he couldn't hear the tower. At any rate, he drove his fire truck onto the runway and into the path of Vic's still speeding airplane.

Vic had slowed down to approximately 70 mph by this time and was nearing the fire truck. So he retracted his gear and slid to a stop short of the fire truck. Vic said that he thought he could have stopped before reaching the other airplane on the runway by normal use of brakes, and but for the fire truck, he would not have had to resort to the emergency procedure of raising his gear.



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