Flying Safety

HEADQUARTERS UNITED STATES AIR FORCE • RESTRICTED DECEMBER 1948

RESTRICTED

COVER STORY

The C-47 crashed near Cold Bay, Alaska. The three survivors remained with the wreckage and were rescued six days later in a highly publicized rescue operation. See page two for story on arctic survival.

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PENNANT WINNERS

Period: July through September 1948

Blue Pennant Winners:

B-25, Keesler AFB, Mississippi
C-45, Wright-Patterson AFB, Ohio
C-47, *Wright-Patterson AFB, Ohio
C-54, *Kelly AFB, Texas
F-51, Wright-Patterson AFB, Ohio
F-80, Not to be awarded. The rate is not 25% Lower than overall rate.
T-6, Chicago, Illinois (Orchard Place Airport)
Misc., *McChord AFB, Washington

Green Pennant Winners:

B-17, MacDill AFB, Florida
B-25, Randolph AFB, Texas
B-26, March AFB, California
B-29, Castle AFB, California
C-45, Brooks AFB, Texas
C-47, Andrews AFB, Maryland
C-54, Brookley AFB, Alabama
L-5, Langley AFB, Virginia
F-47, *Eglin AFB, Florida
F-51, Stewart Field, New York
F-80, Brookley AFB, Alabama
T-6, Newark Municipal Airport, New Jersey
Misc., Fairfield-Suisun AFB, California

White Pennant Winners:

B-17, *Robins AFB, Georgia
B-25, Biggs AFB, Texas
B-26, McClellan AFB, California
B-29, *Kirtland AFB, New Mexico
C-45, Hill AFB, Utah
C-46, Tinker AFB, Oklahoma
C-47, Shaw AFB, South Carolina
L-5, Randolph AFB, Texas
F-47, *Mitchel AFB, New York
F-51, Lackland AFB, Texas
T-6, Davis-Monthan AFB, Arizona
Misc., Biggs AFB, Texas

*Denotes two-time winner consecutively.

FLYING SAFETY

Volume 4 No. 12 — **December 1948**

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

Direct communication is authorized with the Editor, FLYING SAFETY Magazine, Flying Safety Division, OTAI, c/o Inspector General, First Region, Langley Air Force Base, Langley Field, Virginia.

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.

AIRSPACE, LTD.

THERE SHOULD BE ROOM for everybody in the sky, but sometimes it gets as dangerous as a Sunday highway. And the slaughter is just as sickening.

Early flying men thought of the airplane:

"Here at last is a vehicle with all the room in the world to operate . . . no hugging a narrow road, no waiting to pass bogged down traffic . . . man's dream for complete freedom of movement has finally come true!"

Some of us, unfortunately, still live in that dream of a vast blue yonder, until — a flash of silver and a violent shudder, pieces of airplanes and bodies drop into fields and backyards.

How gory does it have to get before we realize that there is more than one airplane in the sky? To prevent a crazy carnival of dodge 'em and bump 'em there have been adopted clearly-defined, strictly-enforced aerial traffic laws.

There really are no excuses for mid-air collisions. When one occurs, someone is not looking or not flying where he is supposed to be. Five hundred feet is a safe vertical separation for air traffic and planes will pass each other with that comfortable margin as long as pilots fly at prescribed altitudes. But when a pilot flies at an incorrect altitude, especially during poor visibility, he is a potential killer as dangerous as a drunk heading at high speed down the wrong side of the road.

To avoid this unnecessary carnage, always maintain correct altitude assignments while flying IFR and always observe proper magnetic heading altitudes when proceeding VFR — and keep your eyes open!

Don't LEAVE THE

LAST WINTER a B-29 crashed on a bleak hillside in Northern Alaska. Six of the eight men aboard stayed one week with the wreck and were rescued. Two tried to go for help and died in the attempt. In the frozen wasteland of the Arctic and in remote regions of the United States your best chance for surviving a winter crash landing lies in remaining with the wreckage.

While no two crashes are alike in the problems they present, a few basic laws for survival remain the same. How good your chance would be for surviving a winter crash landing depends largely upon how much you know and how well you prepare in advance for the emergency that could happen to you. The story of this B-29 crash has numerous valuable lessons.

The plane was flying above scud cloud at 1,500 feet radio altimeter altitude when the co-pilot saw ground coming up below and pulled back on the wheel just before impact. The plane slid uphill several hundred feet, made an abrupt 180-degree turn and stopped. Three engines were torn off and the fuselage broke just behind the scanner windows. One crewman suffered a broken ankle. The anti-icing tank under the floor of the rear compartment caught fire upon impact and the right scanner received severe face burns. Men in the rear escaped through the broken fuselage and all personnel in the forward part of the plane escaped through the pilot's and copilot's windows.

The fire in the aft section burned for six hours. After it went out the crew moved back to the tail of the plane for shelter. It was minus 20 degrees Fahrenheit. The pilot entered the forward section of the plane and threw out 12 sleeping bags, K-rations, four anti-exposure suits, parachutes, air mattresses and other small items of equipment.

For two days the crew utilized the tail section as a windbreak. On the third day the weather and visibility improved, and the navigator and pilot decided to try to walk to a town the navigator thought was 23 miles away. After the two men departed, the other survivors built a shelter against the buckled fuselage and trailing edge of the wing,

utilizing tarpaulins in which the sleeping bags had been wrapped. They set up a two-gallon bucket near the front of the shelter and burned gasoline-soaked bits of parachute harness and chunks of de-icer boot from the wreckage.

On the fifth day the wreck was found by two F-51's and supplies were dropped from C-47's. Planes were overhead on the sixth day, and on the seventh a "Bush" pilot and his crew walked into camp. The survivors were evacuated by small ski-planes which were able to land not far from the wreck.

Despite poor weather and despite the fact that the search for this lost plane had to cover the entire route the B-29 could have covered on its 14-hour mission, the plane was found in five days. The six men who stayed with the plane were rescued. Bodies of the navigator and pilot were found several days later five miles from the wreck. They had died from exposure.

The navigator and pilot didn't have a chance of reaching help on foot with the clothing and equipment they had, according to experienced Alaskans.

Clothing of the eight crew members was largely inadequate for survival. That they survived was largely due to the fact that 12 sleeping bags were salvaged from the wreckage. Only five men wore jackets such as the B-15 and B-11. Only two had A-11 flying trousers, the remainder wearing flying suits and cotton or OD trousers. Two had no gloves. One man had Flying Arctic Type A-14 shoes and one wore Shoepacs. The others wore only felt shoes. Three wore no headgear of any sort and only one man had a B-9 fur-lined cap.

Efficient heating systems of most modern aircraft naturally tempt aircrewmen to wear a minimum of heavy clothing, but on flights over winter wilderness the only safe thing to do is wear clothes that will protect you if you should have to bail out or crash land. It's easier to regulate temperature in the plane to fit heavy clothes than to fight the cold on the ground with inadequate clothing.

The decision to remain with the plane instead of attempting to reach help is probably the hardest a crash survivor ever has to make, especially when rescue is long in coming. This is the assumed reasoning which led these two men to try to go for help: The weather was dry, but low visibilities made a tight, time-consuming search pattern necessary for rescue planes and the crew members knew they had crashed off course. They had no radio to signal for help as the Gibson Girl was destroyed by fire. They were aware that survival depended on heat for melting snow and the fuel at their disposal was meager. There were injured men in the party who needed medical aid. When the weather lifted on the third day, the navigator firmly believed he knew where he was. He was able to make out the general contour of the hills that partially surrounded them, horseshoe fashion. His map showed a 1,000-foot contour line which was consistent with his interpretation of the terrain. Rough calculations, based on the data he had used in dead reckoning, led him to believe that the crash occurred somewhere on a line he could trace across the map. This hypothetical ground track ran through the horseshoe-shaped 1,000-foot contour line, leading him to believe he had pinpointed his position.

There were two fallacies in the assumed reasoning by which the navigator believed he had pinpointed the crash. There were several such horseshoe shaped contours on the map covering the general area of the crash. Further, some of the data he had used in dead reckoning had led the plane so far off course it ran into a hill. Further use of the same data involved risk of further errors. Also, maps of Alaska are frequently lacking in accuracy and completeness of ground detail.

The two men decided to walk 23 miles in subzero weather in which no one else in the party ventured more than a hundred yards or so from the plane because of the wind. Their general course would have obliged them to walk cross-wind. The men who survived reported they were unable to walk facing the wind even for short distances; they walked backwards when obliged to go upwind.

The absence of the two men robbed the party of the advice and guidance of two officers trained in command and, as their five-mile trek proved, high in stamina. The pilot had been through a similar crash landing a year earlier. The plane they left was a conspicuous landmark, its red wing tips and erect red tail visible above the snow. The snow was soot-blackened by the fire for several hundred feet downhill.

The party was not in *urgent* need of food, fuel, clothing or medical attention. They had a shelter big enough to accommodate them all. Neither man was dressed for a long cross-country trip through deep snow, at low temperatures in arctic winds. Although both officers were active in weekend hikes and camping trips near Ladd AFB, Alaska, it was pointed out that such experience probably led them to believe falsely that they were qualified to tackle the strong winds and much more bitter cold of the Seward Peninsula. The Alaskan guides who found their bodies reported they had done well to have gone the five miles they covered before succumbing to the cold.

Knowledge is the greatest aid to survival which aircrews can have. The Arctic Indoctrination School at Nome is training 60 men each week in techniques of arctic survival. However, this school cannot train *all* the Air Force people subject to emergencies such as the one discussed here. Individual units operating in cold climates must see to the training of their aircrews in cold weather survival. Aircrew competitions in such arts of survival as building snow and ice houses with prizes to the best crews have been suggested as one means of spurring interest in such training.

Emergency ditching drill should be held. Survival equipment should be placed in the plane where it is least likely to be destroyed by a crash. The importance of wearing adequate clothing should be stressed repeatedly in briefings. *Crews should be checked for proper clothing before every flight.* Doctrines taught in the Arctic Indoctrination School should be widely disseminated and practiced by crews flying in arctic climates.

With flights over the polar regions increasing in number all the time, adequate, intensive arctic survival training is a necessity. Procedures for search and rescue have been established to cover every area over which Air Force planes fly. If you go down you will be found. But it won't be much help to you if you have died from exposure because of insufficient knowledge of arctic survival and inadequate preparation for the emergency that could happen to you.

In a Dazey Field

TEAM UP an irresponsible flight leader along with a foolhardy pilot and you have a sudden-death combination. In this case they set up an accident which caused the death of the wingman and two other pilots who were unfortunate enough to be in the air at the same time and place.

A formation of five Reserve planes composed of a C-45 and four T-6's was given a VFR clearance by Flight Service via the telephone and took off on a cross-country flight.

The formation led by the C-45 proceeded VFR, but it was ragged. The pre-flight briefing was inadequate and they had no inter-plane communication between the flight commander and his wingmen.

Encountering low ceilings and visibilities, the C-45 and T-6's parted company completely. Two of the T-6's landed at a nearby airfield. One other T-6 and the C-45 landed at separate airfields in the vicinity.

But the remaining T-6 pilot continued on his original flight plan as far as heading was concerned. He actually was down to 500 feet just below the overcast, trying to fly contact in IFR weather.

He came to a river which he knew passed by the field at his destination and followed it until the field was in sight. Visibility was eight to 10 miles.

Blissfully unaware of other airplanes in the area, of which one was a C-45 letting down out of the clouds from the low cone, he barged right up towards the field.

Just at that time the C-45 came out of the soup, and the T-6 collided with it at 500 feet.

Both planes lost their left wings and both made a half roll before crashing. The C-45 exploded in the air and burned on impact with the ground.

Ceiling at the time of the crash was reported at 500 feet overcast with three miles in rain showers.

Nothing can be said in favor of the C-45 pilot who led the formation of T-6's in such a haphazard manner.

The pilot of the T-6 had violated AF Regulation 60-16 by flying contact in IFR weather and later violated a second paragraph of 60-16 by entering a control zone under IFR conditions without prior approval of the control tower.

It seems that the grim reaper is just waiting for some pilot or pilots to give him an opening where he can really wreak havoc. Don't let him.

REQUIRED

Adapted from material submitted by Air Materiel Command and

AIRPLANES REPRESENT a lot of thought and labor. They represent years of engineering research, of draftsmen pounding their skulls against drafting boards, of skilled workers spending long hours at their benches. And if you want to be downright practical, they represent a lot of money. All this time, skill, and expense goes into these airplanes for just one reason — to provide you with safe, efficient airplanes to do your job.

In order for you to handle your airplane proficiently, you must first know every detail concerning its operation. And, believe it or not, the best place to get this information is from the flight operation handbook which is a section of the tech orders for a particular airplane. You can't expect to step from one model airplane into another and use just your past experience to fly the new model. The accident report file proves that this cannot be done safely. Many pilots have skipped reading the flight operation handbook only to wind up behind the well-known eight ball because of ignorance of the airplane's operation. Accident reports may charge them with pilot error, but many such errors can be attributed directly to not reading and understanding the airplane flight operation handbook.

Although the old saying is "familiarity breeds contempt," it is believed that if you were familiar with and understood the prodigious amount of research, coordination, and effort necessary to produce those relatively few pages of instructions, you would be more apt to read, remember, and trust the instructions.

Aircraft manufacturers and the Air Materiel Command are constantly striving to improve the format and contents of airplane flight operation tech orders so that you will have concise, authentic, easy-to-understand and handy-to-use handbooks on each type airplane and its operation.

Now and then AMC receives an Unsatisfactory Report pointing out where it missed the boat in a handbook, but it is believed that persons in the field should inform AMC more often about the discrepancies they find. More than that, AMC would like to be "told off" about where and how they can make the publications more valuable and easier to use.

It is AMC's firm belief, since these publications are prepared for field use, that field personnel are in the best position to assist in improving the presentation of the technical information. There are several ways this can be done. Take any tech order, leaf through it and notice the illustrations, charts and diagrams. Then review the written information carefully. Everything is there. Old heads in maintenance normally take care of certain things that "Joe Fuddy," the inexperienced guy, wouldn't think about. After all, Joe feels the same responsibility, but because he hasn't had the years of experience and the know-how, he only has the handbook for his "Bible," and if it lacks the necessary information, he may miss something that will result in a failure.

The average pilot does not realize the many hours of careful planning, diligent thought, and conscientious effort represented in each airplane flight operation handbook. The writers of these handbooks actually have a great responsibility, be cause a single incorrect instruction might result in

READING

J. W. Casey, North American Aviation, Inc.

the loss of an airplane and lives.

When the production of a new model airplane is initiated, contractor personnel makes an outline of the material to be included in the handbook. This outline is reviewed in a conference with representatives of the Air Materiel Command, and all details relative to subject coverage and arrangement are carefully planned. Only after complete agreement as to handbook content do the contractor's personnel begin the actual research and writing.

Hundreds of blueprints are scrutinized to determine the innermost workings of each installation, and numerous conferences with engineers develop the proper method and time for operating each system, part, or unit on the airplane. Consultations are held with representatives of engine, propeller, and other parts suppliers to ascertain the recommended operating instructions for their particular unit.

The manufacturer's aerodynamics section supplies information on flight characteristics, and take-off, climb, cruise and landing charts. Engine operating instructions and operating limitations are furnished by the power-plant test group. The stress group submits data concerning load limitations and prohibited maneuvers.

All datum is collected and analyzed, then actual writing begins. Photographs are taken and pen-and-ink drawings of the various systems are started. Constant coordination is necessary because, as construction of the airplane progresses, thousands of changes, mostly minor but a few of a major nature are made, and these must be included in the text and the illustrations. Because the handbook must be ready 30 days before delivery of the first airplane, certain changes are not included since they take place after the due date of the handbook. These changes are subsequently explained in the first revision to the handbook.

After each section of the handbook and the illustrations are completed, copies are made and distributed to engineers and test pilots for their approval. Any errors, discrepancies, or differences of opinion are corrected, and then the manuscript and illustrations are presented for review by the handbook team from Air Materiel Command. Each paragraph and illustration is carefully gone over and analyzed for adherence to specifications, subject coverage, and correct instructions. After receiving the reviewing team's approval, the handbook is released for publication.

Even after the handbook is published activity does not cease. Those changes which took place on the airplane after the handbook due date are investigated and revision pages explaining new installations are issued giving additional information and occasionally correcting slight discrepancies. The flight operation handbook is not considered complete by the contractor until the last revision pages are published, usually 90 days after delivery of the last airplane of the contract. Then Air Materiel Command assumes the responsibility of supplying added information to the handbooks in the form of tech orders.

That is a brief picture of the time and effort expended by contractors to make airplane flight operation handbooks an information medium that you can use and trust. This information has saved lives —it may save yours!

TWO HEADS ARE BETTER

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

"ADD TO THE RIGHT, wrong, and Air-Force way, the hard way and you have a combination hard to beat. In fact, if you beat it, you're just plain lucky." Those ungarbled words were passed on to me about a year ago by a gent who has been in the flying know for quite a while. To qualify the man of words let's look at his record. Twelve thousand total hours, just under 2,000 hours of weather time, 20 years of flying. That, you'll have to admit is a respectable pedigree.

It was just a year ago that the operations officer in my outfit put the duty pilot whammy on me. (I was brand new to this outfit and not hep to talking my way out of such deals.) The duty pilot involved flying copilot in a B-25 for seven days with proposed stopovers ranging from Los Angeles to Canarsie, New York.

While waiting for the colonel to show up, and having nothing more to do, I ran a quick check on him and how familiar he was with airplanes — especially B-25's on instruments. I had no sooner satisfied my curiosity and was returning his Form 5 to the records cabinet when in he walked. He introduced himself, picked up the Form 23 which I had prepared and we walked into the weather office. If ever I saw a man get briefed, it was that day. He poured over the sequences, the adiabat and the winds aloft chart like a Philadelphia lawyer preparing for court. The forecaster handed the clearance to the colonel who cleared himself at the operations counter.

"Now, Captain," he said. "I want to brief you on our proposed route."

What a geography lesson that was! He really had the route cased.

He had every radio fix listed, the distance between range stations, identification signals and every fix within 100 miles of the airway we were going to fly.

The next thing he said was really one for the books.

"Captain, let's get together on this flight. I learned a long time ago that two heads are better than one on this sort of thing. I want you to watch me closely. If I am higher or lower than I should be, I want you to tell me. Just signal with your hand, palm up if you want me to go up, palm down if you want me to descend."

"Maybe I checked the wrong Form 5," I said to myself.

"And," he continued, "I want you to contact each range station and compulsory reporting point. As soon as we establish a ground speed you can recheck our ETA's."

"Great, you sure you don't want me to fly this heap too?" I said to myself — repeat, I said to myself.

In a matter of minutes we were in the air. At 7,000 feet we leveled off. The pilot settled back in his seat and made himself comfortable. I switched over from VHF to Compass. He was right on the beam. We reached our first checkpoint about one minute off his ETA. When we passed over the next station, I made a position report, got our exact time over the station and figured our ground speed. We went through some rain, then turbulence and finally out on top.

It was while we were on top that he really surprised me.

"During our letdown," he said, "if you pick up an off-course signal before I do, be sure to let me know.

"You will hear them before I do. The man who isn't flying always does, so let me know.

"If we are off to the right and you want me to turn left, just motion to the left. If you want me to turn to the right just motion to the right."

Within a half hour we were skimming the tops and soon afterwards we were back flying in rain. The only time the altimeter moved was in turbulence. I felt sort of funny at first telling the driver with a wave of my hand that he was 50 or 100 feet off. But when I did, he nailed the needle to 7,000 and there it stayed.

We arrived over the station at our first destination and were cleared to descend to 2,500 feet on the SW leg. It was during the descent that I caught on to what the colonel had said about me probably recognizing an off-course signal before he would. Still a bit reluctant to say anything I let him go and counted six distinct off-course signals before he noticed one. Of course, all I had to do was listen. He had to fly and listen at the same time. We broke out on final just a hair to the right of the runway. The ceiling had been about 400 feet, but the visibility was good.

That evening as we ate at the club, I brought up this business of the hand signals. Just about the time the colonel and I were going to get started on the subject, one of his long-lost buddies taxied up to the table and led him out the door. His parting shot was that he would either see me back at the BOQ or at operations at eight in the morning. To kill time, I took in the local cinema. During the picture I couldn't help but ask myself why a man of his experience in the flying game was so willing to sit in that left seat and practically have a junior birdman tell him how to fly the airplane.

Later that night, in he walked. I went down the hall, got a couple of cokes and put the question to him rather bluntly. "I have always figured that two heads are better than one. It stands to reason that a man flying an airplane on instruments doing all the radio work, navigation and flying at best will be pretty busy. While on the other hand, if you have two people up front and split the work load you can do a 100% better job and work 50% as hard."

Then he brought up the matter of crossing a range leg. "Today you probably picked up an off-course signal a lot sooner than I did. That again is quite natural because all you had to do was sit and listen to the signals and think to yourself what a dope I was for not picking up the changes sooner. We'll just let you try it tomorrow morning."

The next morning we took off at eight o'clock. We were VFR for about the first hour of the flight. The colonel had established our groundspeed. We were right on the airway and everything seemed to be running smoothly. We went into the clouds at 4,000 feet. There was no turbulence, but for the first five minutes or so the altimeter and directional gyro moved like they were being worked over by the granddaddy of all thunderstorms. Pretty soon I settled down to flying the airplane. I did pretty well on my altimeter and heading until we got within 200 miles of destination.

The weather report started the altimeter and directional gyro off on another rampage. Instead of improving as the weatherman had said, and I had hoped, the destination had lowered to minimums. Up until this moment I had made four instrument approaches and had never made one with a ceiling of less than 1,200 feet. Half hoping that the colonel would elect to take over before we arrived at destination, I plodded on and on. We were held over the range station for 40 minutes, actually it didn't seem nearly that long.

While we were holding, the colonel told me that he would take all instructions over VHF and relay them to me and I was to concern myself solely with flying the airplane.

Recognizing the fact that I was going to have to make the approach, I settled down determined to do my best. Returning inbound after the procedure turn with my altitude and heading right on the money, it dawned on me that maybe this old boy really had a good idea. There seemed to be nothing to it. As I passed over the low cone I reduced the manifold pressure and we started a 500-feet-per-minute descent. I was doing so well just concentrating on the instruments that before I knew it I had broken out into the clear at an indicated 450 feet. We were lined up right down the runway.

From that minute on I was sold on the idea that two heads are better than one. That was a year ago and I have been doing it ever since. The next time you're off on a cross-country under instrument conditions try this system and convince yourself that there is an easy way to flying instruments.

SLOW DOWN CHUM!

By CAPT. PAUL W. ECKLEY
Safety Education Officer
Headquarters Tactical Air Command

WHY DO PILOTS always seem to be in such a hurry? What's the reason for all the rush?

Sometimes you'd believe that all the pilots in the Air Force are from a great metropolis where everybody is always in a rush trying to catch subways, buses or trains, or just plain in a hurry. These residents always seem pressed for time. They look neither right nor left as they elbow their way through the crowds, giving no thought to the comfort of their fellow human beings. Many pilots have been observed to act in the same manner.

Stewart Field recently reported a T-6 accident that was caused by a pilot in a hurry. In this case a tight overhead pattern and peeloff was flown in preparing to land. The pattern was so small and took such a short time that when the pilot broke his glide over the runway, the airplane promptly settled on its belly. The flares, red lights, and radioed warnings from the tower could not stop this pilot as he serenely waited for the wheels to kiss the pavement. The chopping of the propeller on the concrete is a far different sound than the kiss of rubber on the runway. It was then that he realized with great embarrassment that the gear was still retracted. The walk to the ramp from the crash took a lot longer than the time he would have consumed by flying a larger pattern and making proper checks.

Take a trip to operations one of these days and see pilots lined up at the weather and operations desks champing at the bit to get in the air. Nothing makes fly-boys more addled than to wait in line in the weather office for the forecaster to finish a clearance to some far-off place, and then have another pilot shove his clearance under the forecaster's nose. (Especially if that fly-boy happens to outrank you.) Sometimes you can actually see the pilots chewing their fingernails in their impatience for the dispatcher or airdrome officer to sign the clearance. Then out the door they zip in their mad rush to man their planes. It really *is* a "scramble."

Out on the line the same procedure continues. They kick the nosewheel tire and ask, "Where the hell is the fire guard?" Then without slowing up a bit they vault into the cockpit, holler "clear," and taxi off in a cloud of dust.

Take a seat on the ramp one of these days and watch some of our hot-rod pilots taxi by. Some of them roll by with a look of utter boredom on their pusses. Their arms are out the windows and they are evidently dreaming of something far off at the end of Green 5. Others come by with a Spencer Tracy scarf flying, but with that same gleam in their eye. Jets squirt past with the round dome of a crash helmet filling the canopy and a pair of eyes peeping out from under the brim and barely over

the edge of the cockpit. But best of all are those that zoom by riding the brakes with abandon and with their faces and bodies inclined forward trying to get a few extra miles-per-hour ground time saved. They disappear around a bend in a cloud of dust and shortly thereafter appear in the air with the gear retracted starting out on course in a mad climb out of the traffic pattern.

What's the rush? Where are they going that this speed is so necessary? More often than not, if you check, you will find that the purpose of the flight is "flying proficiency." Even when they are just getting flying time they will plan a direct clearance flight over an area with no check points instead of going airways because they save a few minutes' flying time by going direct. When they reach their destination on a cross-country flight and a straight-in approach is denied, you can hear the squawk all the way to Elmendorf. If their touchdown is going to be past the first third of the runway . . . so what the hell . . . drop it in on the second third. (It will probably take all of five minutes to make a go-around and another landing.) If a short cut to the ramp via the first taxistrip can be made, with a screeching of tires and brakes and a hurried unlocking of the tailwheel they take it, even though they may blow a tire or groundloop in the process.

What's in a pilot's make-up that requires him to complete his flight in such a hurry? Why the mad rush? He can't wait until he gets in the air and then he can't wait until he gets back on the ground. Certainly that is no way to live a long and fruitful life.

Numerous barriers are placed in his path to slow him down. Stacks of regulations are published to stop him, but still pilots fly almost as fast on the ground as they do in the air. The Form 23 stops him right off the bat. Time must be consumed in completing this form and signing four or five times in different places. Then the whole thing must later be checked over by the airdrome officer or the clearing authority. Then further, if it's an IFR clearance he will have to wait for ATC clearance before he can get up in the soup. Hurry up and wait! That, however, may be the reason they rush so.

Maybe that is the answer. All these things must be completed and still the pilot feels that he must get to where he is going before half the day is gone.

In any event we should all give a thought to the manner in which we rush through getting a clearance, taxiing out and getting in the blue. Rushing has cost many a pilot his life. Flying is not a vocation that is suitable to speed other than in the air. Take time, be meticulous, perfect, and exact and you will live a long time. The more that you rush, the quicker you approach your life expectancy. Slow down, chum . . . slow down.

Flying Safety BRIEFS . . .

SKIING PACKET

THE FIRST INSTALLATION of specially-constructed retractable skis on a Fairchild C-82 cargo plane has been made by engineers of Air Materiel Command Headquarters, Dayton, Ohio. The skis, which can be raised or lowered in relation to the plane's regular wheels, permit landings on either snow or concrete runways.

The special gear was developed originally for use on C-47 cargo planes. This type later was used on the Naval expedition to the South Pole. The new adaptation was made especially for use with the large cargo-carrying Fairchild C-82.

The C-82 installation is the first to be operated electrically and is also the first to require the use of a nose ski. The main skis measure 16 feet long and four feet wide, with the center portion cut out to permit the wheel to protrude through the ski. A novel feature is the use of an aerodynamic rigger, a small wing attached to the tail-end of each ski. This wing holds the ski in the proper position while in flight and helps lift the weight of the installation when the gear is retracted.

In flight the entire landing gear is retracted to the bottom edge of the nacelle, but is not completely retracted into the wheel well. The additional weight and the inability to retract completely results in some loss of pay load and a slight reduction of cruising speed, but AMC engineers have pointed out that this is offset by the fact that the skis permit this large all-purpose cargo plane to operate in areas which are closed to planes with conventional landing gear.

The ski plane is undergoing tests at Ladd Field, Fairbanks, Alaska. It will be tested on all types of snow and ice for takeoff, landing distance, and turning radius, with particular attention being paid to the functioning of the completely new nose ski.

The ski-type gear will make airfields usable throughout a greater part of the year than has been possible before, and will also make air transportation available to the snow-covered arctic areas.

NO TANK SWITCHING

A revolutionary continuous-flow fuel system which skyrockets speed and efficiency in both aircraft servicing and fuel system operation has been designed at the laboratories of the USAF's Air Materiel Command.

This new continuous-flow system, conceived and developed by Capt. David Samiran, veteran AMC Power Plant laboratory soldier-scientist, packs a one-two punch.

First, it provides an automatic continuous flow of fuel from all tanks to all engines of a plane without any required action on the part of the crew. Second, it permits the refueling of all tanks quickly and efficiently from a single and easily accessible point on the aircraft.

In the past, many planes have crashed and countless others have had narrow escapes because existing fuel systems required pilots to switch tanks manually under hazardous conditions. Also, fuel-transfer systems were often inoperative or too complex. The continuous-flow system eliminates these dangers by connecting all tanks and all engines.

Fuel is supplied automatically to the engines by a system of pumps and valves until all tanks are empty. In case of engine failure or damage to the system, the engine or damaged part can be shut off manually from the rest of the system.

The single-point refueling feature of the system solves most of the problems hurled at fuel system experts with the advent of the Air Force's new super-size, super-range bombers and cargo planes.

These AF giants require a tremendous amount of fuel which is distributed in many tanks throughout the aircraft structures. The B-29, for example, has 29 fuel tanks with 11 servicing points.

Using conventional methods, it takes 13 men with four trucks 45 minutes to gas a B-29 completely. This involves the waste and fire hazard of gasoline spillage and the possibility of injury to personnel who must climb on the plane to reach the various servicing points.

On the other hand, using the single-point system, the B-29 can be refueled completely from one

point by one man and one truck in 30 minutes. The aircraft is serviced as the man stands on the ground, and there is no chance of gasoline spillage. The operation can be accomplished with the engines running if desired.

The single-point system also makes possible the transfer of fuel from one airplane to another, a feature which would take on great importance in the event of a forced landing at an emergency field inaccessible to ground servicing units.

In addition, the new air-to-air refueling program, undertaken to increase aircraft range, would never have been possible without the development of a single-point refueling system.

The system is currently being incorporated into B-36, B-45, B-40 and XB-52 airplanes, as well as the majority of medium bomber designs now under consideration by the Air Force.

FOIL AND SPATS

Like twentieth century counterparts of Shadrach, Meshach and Abednego, three volunteers of Air Materiel Command's Aero-Medical Laboratory braved a roaring fire fed by 200 gallons of gasoline to test new clothing designed to be worn by the men who fight aircraft crash fires.

The biblical characters relied on spiritual faith to protect them, but these men relied on scientifically-designed clothing. The test was one of a series being conducted to determine the relative safety and heat-resistant qualities of various types of fire-fighting clothes.

Feature of the recent test was AMC's own lightweight suit made of aluminum foil laminated to a cotton backing. The suit employs the principle of heat reflection and is designed for use by structural fire fighters who are exposed to very high degrees of heat, but is not designed to be worn into the flames.

Material in the foil laminate weighs approximately three pounds, and the entire suit, complete with rigid helmet, weighs under eight pounds. It consists of trousers, zippered jacket, the foil covered rigid helmet, gauntlets, and spats which are zippered over ordinary rubber overshoes.

The eyepiece in the helmet is also a new development. It is made of high heat resistant glass onto which gold has been evaporated and the whole laminated with vinyl resin. The eyepiece will withstand over 2000 pounds of shock and 2000 degrees of heat, and has been found far superior to standard types of eyepieces.

One of the three types of suits worn during the test was the standard "Bunkin" suit widely used by AMC crash fire-fighters. It consists of cotton cloth trousers and long jacket, with a wool lining. A standard helmet is worn with this suit.

The men advanced on a pit of flaming gasoline which simulated conditions existing during a fire following an airplane crash. Thermo-couplings attached to their bodies recorded changes in body temperature.

The foil laminate suit was found to give its wearer the greatest comfort and protection and suffered the least damage during the test. For added safety fiber-glass backing will be substituted for the present cotton in the final models, and the entire suit will be sewn with fiber-glass thread for safety.

AIRLIFT

MAINTENANCE

By CAPT. HOMER P. ANDERSEN

MEN IN COVERALLS—working under actual field conditions outdoors—are doing a maintenance job in Germany that would be the envy of an established continental U. S. base with its convenient hangars and shops.

The airlift to Berlin has maintenance personnel working around the clock, in good weather and in bad, at wartime tempo, and they are setting records for aircraft utilization. When an all-out air operation is begun with 87 per cent of an outfit's airplanes flying and ends up 24 hours and 652 round trip flights later with 90.5 per cent of assigned airplanes utilized, it looks like magic. Actually, it isn't. The figures were taken from the aircraft status boards in Germany on Air Force Day when USAF planes hauled 5,582 tons of coal to Berlin. They mean that maintenance people not only kept the starting planes flying but put additional planes in service before the 24-hour period ended.

Although the tons carried to Berlin in one day have exceeded the record of the "Hump" operation in China, safety of air crews is considered more important than tonnage carried. There is great rivalry among squadrons to get every available plane off the ground, but if the airplane is not as safe as it is required to be, engineering does not let it fly.

Throughout the airlift operation there is a spirit of teamwork between pilots and maintenance men. When the plane returns empty to its home base its crew chief is on the line or at the hardstand to meet it, and the records established in getting the planes off again within a matter of minutes reflects the quality of the Air Force mechanics.

If more than routine adjustments are required, the pilot notifies the maintenance check point by radio after landing, giving the status of his plane. The right specialists are on hand to make inspections and repairs with no loss of time while the plane is being refueled and reloaded.

One night while one block of 40 C-47's was landing at Wiesbaden AFB, pilots of 31 of the planes reported to the maintenance check point that repairs were required before they could take off again. During the interval for loading and refueling, night alert crews had put 24 of the 31 planes back in service in time to go out as scheduled.

Typical examples of the type of work done that night:

Pilot reported mag drop on right engine at 2105 hours. The plane was back in service again at 2130.

Pilot reported low vacuum at 2110. The alert crew had the trouble remedied at 2130.

Pilot reported radio trouble and fluorescent lights out at 2340. At 2352 the plane was again in service with a radio receiver and fluorescent bulbs replaced.

In addition to such routine maintenance required to keep the planes flying on schedule, inspection crews accomplish what amounts to 25-hour or interim inspections without removing the plane from its round-the-clock flight operations. In the case of the C-54 Skymasters the detailed pre-flight and daily inspections as outlined in T.O. O1-40NM-6 detect and correct maladjustments and defects which would, if not corrected, cause accidents or excess maintenance at other inspection periods. These daily and preflight checks eliminate the need for 25-hour inspections on the C-54. Crews assigned to the C-47's in the airlift start their 25-hour inspections after 20 hours, finish them before the planes have flown 30 hours. Since the round trip to Berlin takes about four and a half hours, the crew has three loading periods to finish the 25-hour inspection. Part of the plane is inspected during each pause.

When it comes to the 50-hour inspection of C-47's and the comparable "intermediate" inspection of C-54's, the planes miss a flight or two. Eight to 12 hours is a fair average for the time required to accomplish these inspections.

Despite the difficulty of making engine changes and doing the hundreds of other maintenance chores at outdoor docks, in rain, sun, or under Christmas tree lights at night, airlift planes have established thrilling records for hours flown per month. They are not new planes by any means—the C-47's averaged more than 2500 hours each when the lift began, while many of the C-54's rushed to Germany had been flying for five or six years and had logged around 5,000 hours apiece.

C-47 No. 43-15045, brought into the airlift from Furstenfeldbruck, was considered an average plane with about 3,000 hours. In July it flew 276:55 hours, in August 214:25 hours, and during the first 15 days of September it flew 151 hours. Six other C-47's attached or assigned to the 60th Troop Carrier Group at Wiesbaden flew more than 200 hours in August. The same spirit kept 12 Skymasters of the 20th Troop Carrier Squadron at Rhein-Main in the air a total of 2,833 hours in August, for an average of 236 hours per assigned airplane. Such figures would be the envy of any maintenance outfit equipped with elaborate shops and adequate specialists. That it has been done under conditions paralleled only by wartime operations, and despite shortages of parts and men, is a tribute to the skill and determination of USAF mechanics.

Practically every command in the Air Force is represented among maintenance personnel assigned to the Airlift Task Force. Men wearing USAFE shoulder patches are handling wrenches alongside men wearing patches of MATS, AMC, Strategic Air Command, Training Command, Tactical Air Command, Air University, and others.

The airlift has demonstrated conclusively that the safety of a piece of equipment is equal to the quality of the men who maintain it and operate it. When both pilots and maintenance men know their airplane, the old squawk of one expecting too much of the other disappears or changes to good-natured ribbing.

Most airlift pilots, crew chiefs will tell you, are thorough in reporting troubles. During a few weeks of airlift maintenance the average crew chief will see about everything ever likely to be written on a Form 1-A. This is because the airlift is putting hours on planes faster than ordinary peace-time usage.

"These pilots don't miss a thing," one crew chief commented. "But once in a while they imagine something is wrong and write it up in the Form 1-A. Then it's like finding a needle in a haystack before you can let him know for sure nothing is wrong."

One of the most common errors in write-ups, even among "Vittles" pilots with thousands of hours, is that of repeating on the Form 1-A deficiencies that were already noted in the "status today" box which give the reason for the red diagonal. That one doesn't take long for the crew chief to discover, but there are others which waste time. Certain components of an airplane, especially electrical, radio, and hydraulics systems, have vague meanings for many pilots. A rapid-paced operation like the airlift accentuates the need for pilots to know their airplanes well in order to report troubles accurately, thereby speeding the work of maintenance crews.

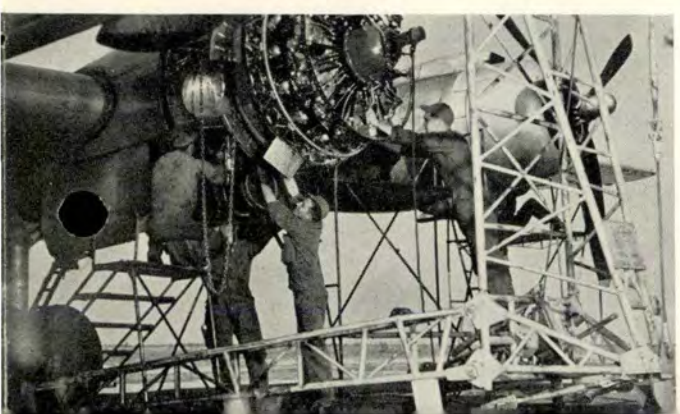
The biggest part of airlift maintenance concerns engines and accessory sections. Proper functioning of these parts is considered the most important from the safety standpoint. Maintenance people pay particular attention to engine bed bolts, primer lines, intake pipes, engine plumbing, in fact the entire power-plant assembly. With four takeoffs daily at maximum loadings, the life of engines depends greatly upon the power settings pilots use. When pilots stay within limits of power settings engine changes will usually occur within prescribed time limits. On the other hand, pilots who use excessive power takeoff after takeoff hasten the time when the engine must be overhauled.

When a task force plane is written up on a squadron engineering board, the same information is phoned immediately to group maintenance, then to base or wing maintenance, and finally to Task Force Headquarters. Every level of command knows at all times the status of every individual airplane, how many hours to the next engine change, when it is due for intermediate or 50-hour inspections, when it is due to go to Oberpfaffenhofen or Burtonwood for a major inspection after 200 hours, and when it is due to return to the United States for a 1,000-hour cycle of reconditioning.

The system of progressive maintenance and command maintenance control has been put to the test under the most grueling conditions by the Airlift Task Force. The operation has thoroughly proved its value in simplifying the provisioning of parts for any airplane. Using this system in the airlift it can be predicted what parts will be needed at a certain time and is a clear approach to determining the stock level required to sustain the operation. Space does not allow detailing the plan here, but it does call for the replacement of certain parts with new ones after a given number of hours before the part normally would fail. Engine conditioning teams have been trained and assigned to the Airlift units with the result that power plant failures have decreased and engine life lengthened.

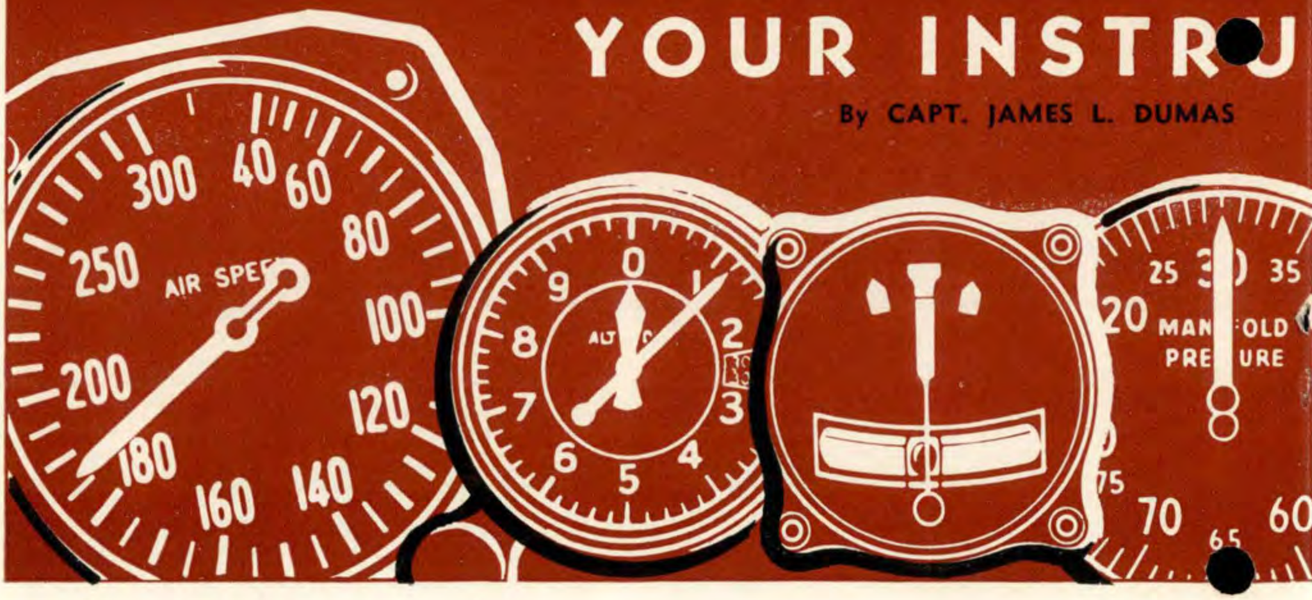
Airlift planes are flying long and hard hours. But maintenance personnel are determined not to let them deteriorate. They are pretty well sold on the idea that a plane kept in good flying condition, though it logs over 200 hours a month, is a better and safer plane than one parked and forgotten in the far corner of a field. In fact, some crew chiefs will tell you that they have been able to improve the condition of their planes on the airlift.


CHECK POINT
A/C MAINT CONTROL



YOUR INSTRU

By CAPT. JAMES L. DUMAS



HAVE YOU EVER WONDERED what your check pilot thought of you as an instrument pilot? The chances are good that his opinion of you as an instrument jockey does not coincide with your opinion of yourself. That doesn't mean that your opinion is better than his. Many check pilots have been heard to say: "You can fly by reference to the instruments better than you did today. All you have to do is convince yourself that you know what you are doing."

Unless you are flying instruments daily, your check pilot realizes your proficiency may be slightly below the desired standard. Nevertheless, if you are a safe pilot, know your procedures and stay within the limits prescribed by Air Force regulations, your chances of getting a pink slip are relatively few.

Your instrument check pilot is usually more safety minded than other pilots. He has certain standards set up in his mind that you must meet. First of all, he observes carefully your preflight inspection and cockpit procedures. He expects you to call for a run over the checklist. By the time you are lined up for takeoff he has a good idea of how safety minded you are.

Let's assume your inspection and cockpit check are satisfactory. Your check pilot lines the airplane up with the runway in preparation for your takeoff. After he stops the airplane he expects you to set your gyro compass to the runway heading. Don't forget to uncage your directional gyro. Some pilots do. If you are in an airplane with a nosegear, he expects you to have little or no trouble holding the plane on the runway. Provided you concentrate on holding your heading to within three degrees left or right of the runway heading, you will stay on the average runway throughout your takeoff. If you are in a C-45, C-47, or other "conventional" geared airplane, your check pilot knows you may need help before you become airborne. Pilots tend to overcorrect in planes with conventional gear. Some lift the tail too high and the check pilot has to hold it down to prevent your putting the props into the runway.

When you start your climbing turns, you should turn to a cardinal heading and then make 90-degree turns. As long as you are climbing keep turning so your check pilot can clear the area you are flying into. He hates to sit there wondering what is ahead. During your climb, trim the airplane to fly hands off. Few pilots use the trim tabs enough. Get into the habit of always trimming your airplane. Your

MENT CHECK

USAF Instrument Check Pilot

accuracy will be much better if you do.

As you approach the altitude assigned by the check pilot you should slowly lower the nose when the altimeter indicates you are approximately 50 feet below your desired altitude. By the time you reach your altitude you should be flying straight and level. Leave your throttles set to climbing power until you have picked up airspeed. As you approach cruising speed, retard your throttles to settings to give you desired cruising and then decrease your rpm's. Slight additional adjustments in power settings may be necessary. Before starting another maneuver, again trim the airplane. Don't rush your check. You forget things by rushing.

AF Form 8-B lists descending turns as following climbing turns and are usually taken up in that order. Assume you are to make a 180-degree turn while losing 500 feet. To be accurate, reduce your power and hold your altitude and heading while allowing your airspeed to decrease to descending speed. As the airspeed approaches the desired speed, check your clock, lower the nose as you roll into your turn and adjust power to maintain a proper rate of descent. At the end of 30 seconds you should have turned approximately 90 degrees and lost 200 feet. If after 30 seconds you are behind or ahead in your turn, adjust your angle of bank accordingly. You should never have to make more than slight adjustments in your rate of turn. The same is true of your rate of descent. Control your rate of descent with power. You should start your timing as you roll into your bank and stop it as you start rolling out.

Let's assume that you were told to level off at 4,500 feet at cruising speed. As your altimeter reaches 4,600 feet, increase your power to cruising while continuing in your descent. By the time you have reached 4,500 feet you will usually be back to cruising speed. Your check pilot expects you to know these procedures.

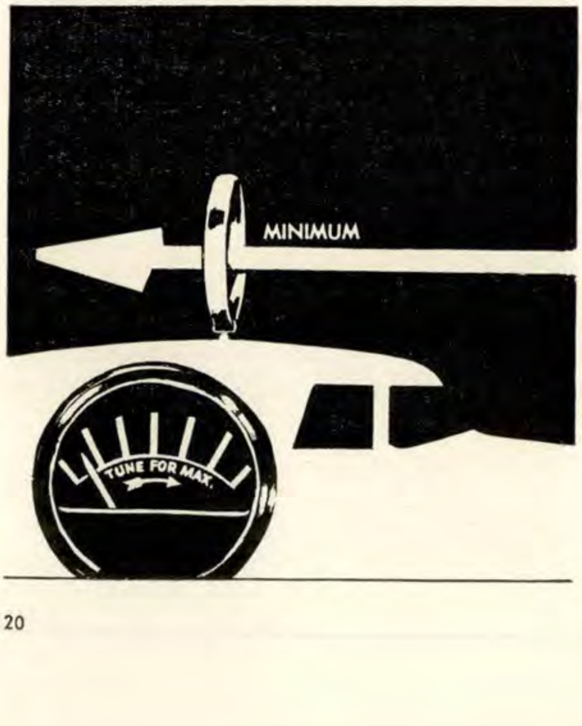
Recovery from unusual positions should be accomplished with the gyro instruments caged since they are likely to spill during these maneuvers. When the check pilot signals for you to recover from an unusual position, he expects your first move to be a positive one in the proper direction. You would be surprised to know how many pilots increase the bank in unusual attitudes and have to reverse the procedure quickly when they discover their mistake. Center the needle, center the ball and stop your altimeter. A lot of pilots have forgotten those famous words.

Simulated engine failure can be given at any time during the check ride. Recently, a check pilot cut one engine while the student was making a range approach. When the engine quit, the student lost altitude and directional control, got excited, forgot where he was, and forgot his single-engine procedure. Remain calm and think when an engine is cut. It is a good idea to practice single-engine procedure often. There should be no uncertainty in the sequence of events when an engine is cut.

The true-fade method of orientation is the one method the Air Force is trying to standardize, but radio-range orientation procedures are as varied as are pilots. Each pilot has his favorite method of orienting himself, but your check pilot expects you to know and use the standard true-fade method. It isn't hard for your check pilot to tell when you are assuming your position especially if he has had much experience at instructing and in checking pilots.

Most pilots turn to a bisector heading when starting their range orientation and fly that heading for a few minutes to determine a fade or build in signal strength. If they are getting a fade, they make a 180-degree, turn up the volume, and head for the range leg. You must double check your position by leaving your volume set and check for a build in signal strength as you fly the reciprocal of the heading maintained when you were checking for a fade.

Too few pilots know how to work a close-in procedure. Few can actually recognize their position as



close-in. If you work a true-fade orientation and hit close to the station, your check pilot expects you to switch immediately to the close-in procedure. He is interested in the time you expend in making your approach. The less time you take, consistent with safety, the better.

As more and more planes fly the airways, more and more pilots are held on the ground while actual instrument approaches are made. The faster you work the sooner they get off. When you start your range orientation, do it exactly as you would if you were on actual instruments. That's the way your check pilot wants it so he will know what you would do under actual instrument conditions.

Most pilots fly too far outbound on the initial approach leg. One fatal accident happened this summer because the pilot flew too far out on the final approach leg and struck a mountain. Another fatal accident was caused by the pilot descending below the altitude listed in T.O. 08-15-3 for a procedure turn. He too collided with mountains.

If you look in T.O. 08-15-3 (Instrument Letdown Procedures) and on the bottom of the page you see that the procedure turn is shown as being made 24 miles from the station, do not assume that you must fly that far out before making your turn. That is the *maximum* consistent with safety. The only reason you fly outbound from the station is to lose altitude and get lined up with the field. If you can do that in two minutes, then make your turn. Under normal circumstances it should never be necessary for you to fly out more than three minutes. Letdown in high-speed airplanes should be made at airspeeds below 200 mph. The procedure outlined in T.O. 08-15-3 is safe for any speed below that. Cut your time to the bone. If you are going into a point as busy as Washington, D. C. your time is important to a lot of other pilots.

Some pilots overcorrect when near the station. Some seem to forget that they can be within 200 feet of the range station in the center of one of the quadrants and hear no side tone. If you are near the range station and your airplane drifts off the beam, continue to hold your heading and you will recognize having passed the station by crossing a leg of the range. After passing the station you can correct back to the beam.

Volume control is important. This is the secret in flying the range. The lower you maintain your volume while working a letdown procedure the greater the size of the cone of silence, and the more clearly the leg will be defined.

The lower your volume the more distinct are your range legs, and the more quickly you can detect a fade or build in signal strength.

Aural null orientation, tracking, recognition of station passage, let-down and low approach procedures have been added to the White card check by Air Force Regulation 60-4, dated 1 November 1948.

Most pilots have used the radio compass for homing and tracking, but many have never been instructed in aural null procedures. In spite of the popular belief that aural null procedures are very difficult, they are actually relatively simple. They are certainly within the realm of understanding of all pilots. However, instrument instructors or check pilots can expect to find their work has increased as a result of the new AFR 60-4. The performance of "A" and "B" patterns has been eliminated from either a white or green card check, but the addition of aural null work will require greater training on the part of pilots who must renew their instrument cards.

A knowledge of aural null procedures is certainly to the advantage of all Air Force pilots. Your check pilot will expect you to know them. If you don't, now is the time to start getting instruction from a member of your instrument board. It takes practice to be able to perform accurately aural null procedures, so don't wait until the last minute to request instructions.

Ground Controlled Approaches have been added to the white card check and, in spite of the ease with which most pilots think GCApproaches can be made, few are really proficient in making them. The big trouble with the greatest number of pilots in making these approaches is that they forget the pitch-power method of controlling an airplane. There is no excuse for a pilot getting a hundred feet below the glide path, your flaps and props should be set and you should be ready to establish the desired rate of descent. MAINTAIN your airspeed and control your rate of descent with power. If your airspeed is constant, you can set up any desired rate of descent and maintain it without trouble. If you allow your airspeed to fluctuate on final approach you may as well pull up and try again. It is nearly impossible to stay on the glide path when you are not controlling your airspeed. With a constant airspeed, if you go slightly below the glide path, it is simple to add a small amount of power to decrease your rate of descent. As you go above the glide path, you simply take off a bit of power. If you have established your rate of descent properly when first encountering the glide path, and adjusted your power for the proper rate, you should never have to change your manifold pressure more than once. The important thing is to maintain your airspeed. If you can do that, you can concentrate more on maintaining your heading and you will have a safer approach.

One pilot being checked recently made several GCApproaches and each time he maintained an altitude of approximately 50 feet above the glide path. Finally the check pilot asked him why he was staying above the glide path. He replied that he believed it safer than getting down low on the glide path. His trouble was in failing to trust GCA. If you have that trouble you will be safer if you make a regular instrument approach and let GCA work with someone else. You cannot fly your idea of GCA's instructions. If you don't trust them, don't use them.

It is difficult to fly instruments on a check when you are uncertain of what your check pilot would like you to do. If he fails to brief you, ask him how, when and what he expects you to do. Remember, you are being checked on your own instrument proficiency and your procedures. The check pilot is interested in two things: (1) Do you have an acceptable procedure? (2) Are you a safe instrument pilot? It is important that you and your check pilot know what you are doing.

SEEDING THUNDERSTORMS

A NEW PHASE of the Cloud Physics Project carried on by the All-Weather Flying Division of AMC is well on its way. This phase consists of seeding thunderstorms and is concerned with producing rainfall from thunderstorms and/or preventing the build-up of the storm to the cumulo-nimbus stage by dropping dry ice crystals into the building cloud with the intent of precipitating out the moisture within the cloud itself.

To date, each towering cumulus cloud that has been seeded has stopped its build-up immediately and in no case has the thunderstorm development been completed. This seeding of potential thunderstorms has resulted in some rainfall measurable on the ground, directly beneath the cloud.

COAST-TO-COAST STRIP MAP

A completely continuous photographic strip has been made by a nonstop flight across the United States. Flying in an XR-12 photo reconnaissance airplane, the photographers shot 390 individual photographs — each photograph covering approximately 130 square miles along the 2,700-mile flight line. Flight altitude was 40,000 feet and average ground speed of the XR-12 was 375 mph. A tri-metrogon camera installation was used carrying three K-17 type cameras with six-inch lenses and 400-foot film magazine loads. The three cameras covered an area approximately 490 miles in width.

LANAC

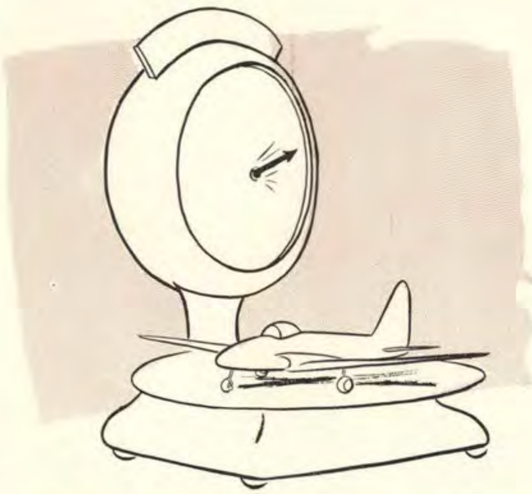
The Laminar Navigation and Anti-Collision System offers comprehensive facilities for all-weather air navigation and traffic control. It enables a pilot to navigate with respect to one or more aircraft and fixed points. This system also enables an airport controller to control traffic by locating and identifying aircraft within the surveillance range of the ground equipment. In addition it has an anti-collision feature which protects the pilot from collisions with obstacles or other aircraft.

LANAC functions are accomplished with the aid of airborne challenger and repliers, ground replier beacons, plus the use of ground surveillance equipment. A LANAC Navigation Beacon is being installed at Elkins, W. Va. for test purposes.

RECORDING SCALE FOR AIRCRAFT

A new hydraulic lift recording scale for weighing large aircraft has been designed and constructed especially for the Air Force by Fairbanks, Morse & Company. The weighing system consists of five scale platforms. Two of these are main scales — each with a capacity of 150,000 pounds. A special scale for the nose of the aircraft is adjustable to two feet below floor level so as to place the aircraft in a simulated level flight attitude. Tandem wheel type

bombers may be weighed, using two tailwheel scale platforms in tandem arrangement. A system of a dial and paper tape for each of the five scales not only gives clear, accurate visual readings, but also records weight data for future reference. This new measuring system, accurate to within five pounds, should be of considerable aid in establishing correct basic weights, maximum loads, and safe operating limits.



FLIGHT INFORMATION MANUAL

A new edition of the Flight Information Manual, containing 236 pages of data needed by pilots, is now available to the public, the CAA has announced.

The manual includes two new chapters on Weather Service for pilots and the Air Rescue League. It may be purchased for one dollar from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Other chapters of the manual list all United States airports with their location identifiers and latitudes and longitudes, an index of range station facilities and transmitting frequencies, a list of overseas communications stations, and a list of standard broadcast stations with their frequencies.

Airway radio communication procedures are outlined in detail, and data are provided on direction finding and Loran navigation. One chapter which is widely used covers foreign and territorial entry and flight requirements. The ground-to-air emergency code for use as distress signals is illustrated, and instrument pilots will find instrument approach procedures and minimum en-route instrument altitudes described in full.

In addition to the single-copy rate, the Government Printing Office offers the two semi-annual copies of the manual, plus 26 copies of the Airman's Guide, at an annual subscription rate of $6.

TOWING HELICOPTERS

Helicopters can be towed in the air hundreds or even thousands of miles for use in rescue operations in a remote area, according to AMC project engineers.

A large helicopter can take off vertically with a line attached to the tow plane. When the tow plane has taken off, the helicopter will ease into autorotative flight with its engines shut off. In this way, the rescue helicopter can be towed great distances at high speeds.

When the disaster scene is reached, the helicopter would be cut loose and begin rescue operations. It could later be towed back by catching the tow line in the air or it could operate independently, if there were airfields in the area.

For this type of operation and also for transport work, the all-metal, tandem-rotored Piasecki XH-16, which is as big as a C-54 airliner, could be used. The detachable capsule on the XH-16 for speeding loading and unloading compares with a Greyhound bus in size and is estimated to nearly double the payload to be carried by the transport helicopter.

VIOLATION!

ED. NOTE: *Reproduced here is a letter written by an airline captain to his chief pilot. Names and dates have been omitted and the letter has been edited to fit space requirements. This is another example of how unthinking and careless Air Force pilots can jeopardize their own and the lives of innocent citizens by ignoring flying regulations — to say nothing of destroying the well-deserved prestige of the Air Force.*

DEAR MR. ———

I wish to report an unusual incident that occurred on a recent flight of which I was Captain.

This unusual incident was a near mid-air collision between my flight and an Air Force B-25 medium bomber approximately 20 miles north of Houston, Texas, at 13:21 cst. My plane was at the time proceeding en route from Longview, Texas to Houston. We had been cruising at 10,000 msl on an IFR flight plan and been cleared by Ft. Worth and San Antonio ATC's to do so. The last clearance received from ATC was: Cleared to HOU tower to enter control area at 3,000, make VFR approach from 3,000, if not possible maintain 3,000, and advise. This clearance was received from BNF radio operator at approximately 13:17 cst. We had entered the control area 25 miles north of Houston when this near-collision occurred and were maintaining 3,000 because we were not VFR. The way I know that we had entered the CA was due to the fact that we crossed the San Jacinto River about 13:18 which is approximately 28 miles north of the HOU radio range. We had ground contact from 3,000, but forward visibility was from about ¼ to ¾ of a mile due to the light moderate rain showers, haze and smoke. The ceiling at this time was about 3,200 msl. My copilot was flying from the right seat at this time and was watching the instrument panel as we actually were what I would consider on instruments. I happened to be looking outside, and all of a sudden this Air Force B-25 loomed up ahead out of the rain, smoke and haze, headed directly for us and at the same altitude.

Immediately after sighting this ship I took over the controls and made a steep diving turn to the right, at the same time reducing power so as not to build up an excessive amount of speed. The copilot later informed me that he did not see this ship until after I had started this diving turn. The pilot of this B-25 evidently did not see our ship until after I had started to make this turn. As soon as he did he also started to dive his ship and make a slight turn to his right in order to avoid a collision. I called BNF radio and had them check with ATC to ascertain the traffic, if any, that they had on the board for the HOU area. They advised none.

After arrival at HOU, I decided to call the operations officer at Ellington Field near HOU and find out if he had cleared an Air Force B-25 from that field around 13:10, and he advised that he had. I then asked him what kind of flight plan the pilot had filed and he advised it was a VFR flight plan. The weather in the vicinity of HOU and Ellington Field at 13:10 was VFR minimums or better, but on the weather report they were reporting rain showers to the north and west of HOU.

I am submitting this report in hopes that you will contact the proper authorities and report this matter to them in full, so that they may take whatever steps may be necessary to discipline the pilot in command of this Air Force B-25 as he has shown utter disregard for the safety of his own life, as well as many others and for valuable property, by wilfully violating sections of the Civil Air Regulations pertaining to visual flight rules. I feel that the only way to put a stop to this type of flying is to report every incident of this nature and to see that something is done about it when they are reported.

Sincerely yours,

AN AIRLINE CAPTAIN.

MA HAS THE RIGHT IDEA . . . . .

OLD MAN NEWTON would do a slow roll in his grave if he ever found out that some Air Force pilots had just about repealed his laws of motion. For the past few years more absolute remedies have been heard for the groundloop problem than the Air Force has had groundloops.

"Rudder, brake and then throttle," says Roger Rudder, a hotrock instructor.

"No, you're wrong," says Captain Power. "Power, then rudder and brake." This, says Power, is the ungarbled word.

In the meantime Rudder's poor student, an accountant by day and Reserve pilot by night and weekends, who has been listening intently, begins to hit his ETD (estimated time of development) on the nose and develops the groundloop complex. He can't wait till he gets back to the boarding house.

Out of breath, he dashes into his room, takes pen in hand and writes home:

"Dear Mom,

"Your boy Willie is in a stew. I am getting more nervous every day. It's not the flying. I am crazy about that, but it's just that I am afraid that I will groundloop on landing. They happen mostly in T-6's and you know I went to twin-engine advanced. I'm having to fly these T-6's here now.

"Gosh, Mom, I'm really worried. All I hear is groundloop, groundloop, groundloop. Everybody here is worried about it. Every time I fly with a different instructor, he has a different way to recover from a groundloop.

"Don't worry about me groundlooping, Mom. Hardly anyone ever gets hurt in a groundloop.

Your loving son,
WILLIE.

In the meantime, Willie's parents, who had worked their fingers to the bone to provide Willie with a college education, put their heads together in an effort to protect their investment. Three days later, Willie received the following letter:

"Dear Willie,

"Your Pa and I have just finished reading your letter. Son, seems to us if you drive those airplanes like you used to run the plow, you just couldn't groundloop. How can you go round and round if you keep that machine going straight? Next time you set down on that landing field just pretend Pa is coming out like he always did to see how straight you're making the furrows. And keep that plane pointed dead straight ahead.

Love,
MA."

G.C.A. S

By PVT. HOWARD

No MAN HAS EVER SEEN an atom or an electron because these two basic particles of all matter are too infinitesimally small to be observed by man even under the most modern and powerful of microscopes. Yet, although these minute particles have never been seen, their behavior is understood so well that scientists have learned to put the electron to work for the ultimate benefit of everyone. Like the yachtsman who cannot see the wind, yet is satisfied that it is the wind's force which fills his sails and propels his vessel, the scientist has been able to evolve complicated and wonderful devices energized by electrons which he never sees.

In the field of communications and radar particularly, the physicist, together with electronic engineers, has utilized the electron's energy with almost miraculous results. Consequently, these submicroscopic jots of matter have provided the means of saving countless human lives in circumstances where there would otherwise have been no hope for the persons involved.

An excellent criteria of the life-saving application of electronic developments may be found in the United States Air Force, since only the most dependable and successful of these devices are ever adopted for standard Air Force usage. For example, the Air Force's Airways and Air Communications Service (AACS) has recently completed the installation of Ground-Controlled-Approach (called "GCA" for brevity) facilities at practically every major Air Force base in the United States and overseas, thereby eliminating one of the greatest remaining hazards to safe flying.

Until the advent of GCA, the pilot who was forced to land his plane on a fog-bound, dust-hidden, or rain-obscured airstrip faced an ordeal which all too frequently resulted in his death, as well as the loss of an expensive aircraft. The problem was an urgent and critical one. Broadly speaking, two solutions were possible: Either a method might be developed to supply the pilot with his own equipment and procedure to overcome the "invisible runway" menace, or else a means could be evolved whereby ground crews, with ground-based equipment, might provide the safety factor which heretofore had been missing during a "visibility zero, ceiling zero" landing. Today, GCA is a development of the latter possibility. Except for several small transmitters and receivers, the adoption of

Ground-Controlled-Approach has not increased the amount of equipment which the already-overburdened aircraft must carry. It's all on the ground.

Today, on any GCA-equipped Air Force Base, the GCA Trailer has become a familiar sight — in time it will probably become a landmark. This trailer is the heart of GCA; it is also a lifeline to the pilot who cannot see to land his plane safely

EES ALL

MILLER 123rd AACS

because of bad weather. Atop the trailer, rotating on a vertical axis 30 times per minute, a large search antenna sweeps the surrounding sky and terrain with radar beams. Whenever these radar impulses encounter a solid object, they are reflected back to the same antenna (which functions on a transmit-receive basis) and are reproduced on six scopes in the trailer's interior. As a result, the GCA operators on duty are furnished with an "electronically-painted" picture of everything within a 30-mile radius of their position.

Regardless of the densest fog or the most obscuring rain *outside* the trailer, a perfectly clear "picture" is maintained at all times before the GCA operator on a bank of radar scopes (oscilloscopes) inside the trailer. Actually, these scopes which the GCA operator interprets are cathode ray tubes, similar to the type used in modern television sets. When radar impulses outbound from the Search Antenna strike an object, they are immediately reflected back to the antenna and channeled to the cathode ray tubes where they cause a fluctuation in voltage input to the tubes, which in turn causes a corresponding emission of electrons to strike the interior surface of the oscilloscopes and reproduce there, in green light, the exact shape and juxtaposition of the original object. What the GCA operator sees on his scopes is actually a small, living map of the area for 30 miles about him. All objects and all movements within that area are reproduced on the oscilloscopes precisely as they exist and occur.

Then, by superimposing lines and graphs on the oscilloscopes which indicate exact altitude and distance from the landing strips, the GCA operator is able to determine at a glance the plane's position and elevation. Flying according to verbal instructions from the GCA operator, the pilot begins his letdown toward a landing field which he cannot see. However, the GCA operator *can* "see" the aircraft, and he constantly counsels the pilot, informing him to increase, or decrease, his rate of descent, his position in relation to the runway, etc. Finally, when the pilot and his plane have been directed right down to the landing strip (at this time the pilot can see the field for the first time), the GCA operator instructs the pilot to land the plane visually.*

There is no guesswork. The pilot has been brought safely down through impenetrable fog, rain, sleet, or snow, to a safe landing. All this has been accomplished through the amazing direction, control, and interpretation, of billions of tiny electrons — which no one has ever seen — the lifesavers of a modern Air Force.

*There have been numerous emergency GCA landings made in zero zero weather.

LETTERS TO THE EDITOR

Dear Sir:

In reading the October issue of FLYING SAFETY, I noticed what appears to be a couple of erroneous or misleading statements.

First, on page 9, in the first paragraph, Major MuCuistion states the CAA compulsory reporting points are "every range station you pass on IFR." While this is true, other compulsory reporting points not so well known are designated by a solid black dot in the Radio Facility Chart (T.O. 08-15-1). Apparently, few Air Force pilots observe the requirement of reporting over these points while on IFR.

Second, question 7 of the safety quiz on page 8 states that "ATC approval is necessary for all instrument flights." Paragraph 60 of AF Reg. 60-16 states that "Flight under IFR not along or crossing a control area or zone does not require ATC clearance —." There appears to be some variance.

Nevertheless, it is my opinion that FLYING SAFETY is a wonderful source of information to all pilots and should be religiously read by all personnel closely associated with flying.

JAMES L. HUDELSON, *Major, USAF.*

Major Hudelson is right on the ball. He is right, we were wrong about the instrument flight clearances. — ED.

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Dear Sir:

While reading your October issue of FLYING SAFETY I ran across an article which made me very unhappy and I am sure that there are more of us in the same boat. The title of it was Violation.

In this article the whole blame was put on the Instrument Check Pilot. Don't you think that is being a little unfair? No Instrument Check Pilot would sign an Instrument card for a pilot if he was sure the man would kill himself.

I for one was a member of the Instrument Board at Fairfield, Calif. And we turned out quite a few instrument cards out there. I think our field had a pretty good safety record.

Now let's get back to the subject of this letter. First I would .ike to know how you can blame an Instrument Check Pilot for what this man did. All an instrument check pilot can do is explain everything to him and check his proficiency on instruments. He can't go along with every man who flies with a card in his pocket signed by him. He can tell the man what to do, but what can he do when this man in 600 or 1,000 miles away? How is he going to know what this man is going to do when he gets in a tight spot?

This article sounds to me that it came from a man who has a gripe against some instrument check pilot because he wouldn't give him a card at some time or other.

What I think should be done is for the fellow who wrote this article should be made to apologize to the instrument check pilots in the air Force. We are not bad guys, you know, and we do try to do our job right. The only trouble is we don't know how a man will conduct himself when he gets off alone.

AN INSTRUMENT CHECK PILOT.

The man who wrote the article in question was an instrument check pilot himself for three years at a command headquarters base. — ED.

Dear Sir:

Recently while flying in a type C-47 aircraft, number 42-24303, I was taking a few pictures from the cockpit.

Using a light meter for exposure, and taking readings from different angles, I moved the meter close to the magnetic compass. When the meter came close enough it caused the compass to spin. Upon this discovery, I made a few checks to see just what effect the light meter did have upon the compass, because I often carry a meter in my personal possession while flying and have noticed that other pilots do likewise.

From the rear of the cockpit, on the far side, the meter was held and a compass reading taken. The meter was then moved to the opposite side of the cockpit, causing the magnetic compass to change approximately fifteen degrees. Immediately the light meter was removed from the cockpit and placed in the rear of the aircraft for safety purposes.

The location and type of the meter may have caused this trouble, or the magnetic compass itself may have been defective in some manner. The flight was between Ernest Harmon Air Force Base, Newfoundland and Tweed Field, Mingan, Quebec, Canada. The light meter was a Weston II.

It may be worthy of checking into this matter further, and if found to be a hazard to flying, brought to the attention of all personnel.

JOSEPH B. WEEMS, JR., *1st Lt., USAF.*

We checked on Lt. Weems' findings with two different makes of photo electrical cell exposure meters in the cockpits of three types of aircraft. We found that both exposure meters caused an error in indicated compass reading in all three cases. — ED.

★

Dear Editor:

The impossible has happened on Okinawa in the 1st Air Division.

A pilot landed a T-6, wheels up, and the training aircraft received only minor damage. This would happen once in a thousand times, veteran airmen estimated.

In this case the pilot took off just before sunset on a normal transition training flight to shoot running takeoffs. Just as darkness settled over the field, the pilot completed his fourth running takeoff. As the pilot climbed away from the field, the right fluorescent cockpit light failed and radio control with the tower was lost.

The pilot endeavored to acknowledge tower instructions with his landing lights and restart the fluorescent light. He lowered the landing gear lever out of the "up" position, but not fully to the "down" position.

The pilot continued flying his pattern and slid the aircraft in on its belly, with practically no damage. Normally this type of landing causes extensive major damage both to the wings and to the aircraft fuselage.

CAPT. KINDRED M. MUSE
Far East Air Force Hqs, Tokyo.

Which proves planes are, if not fool-proof, at least fool-resistant. — ED.

WHY?

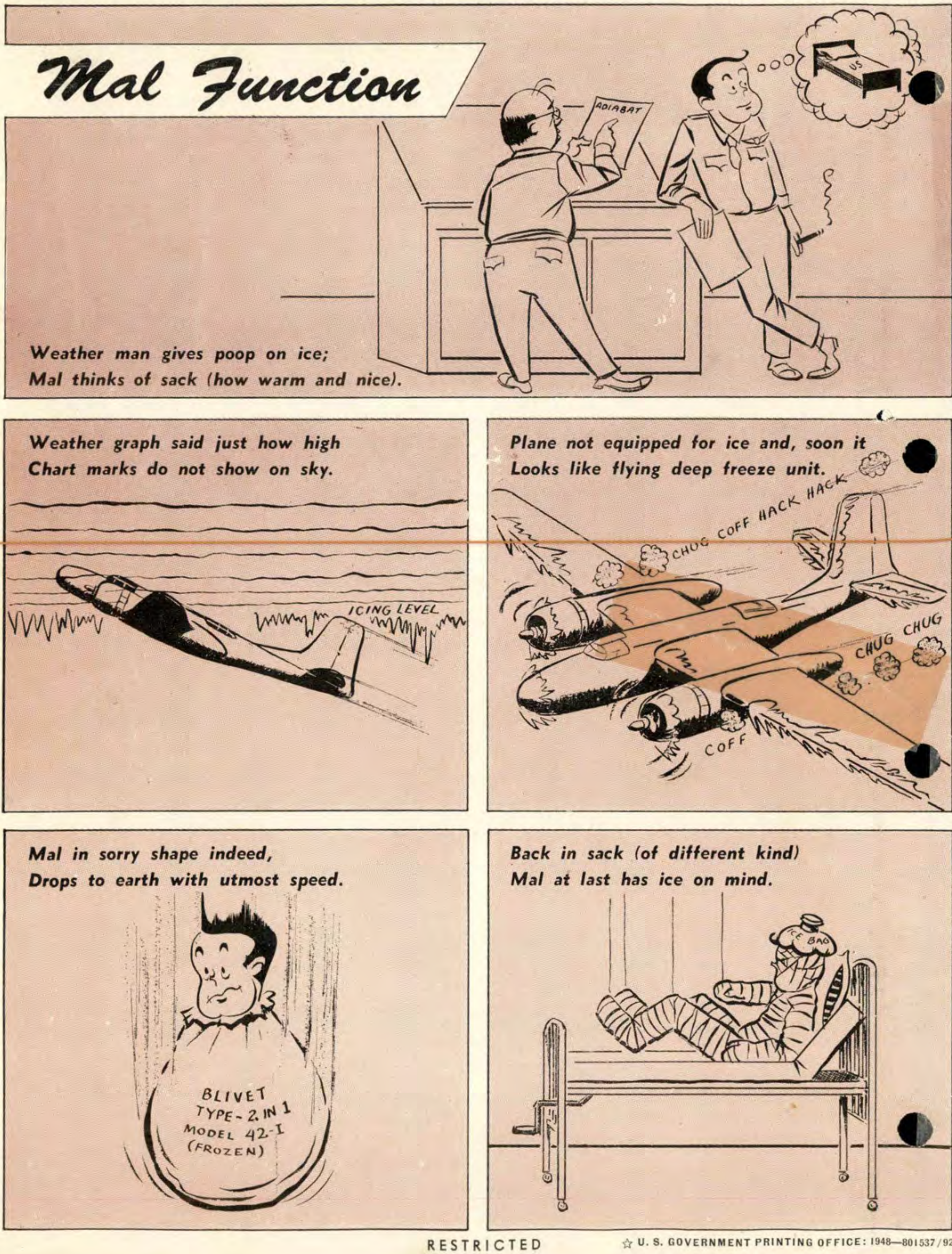
The pilot of this F-82 signed the Exceptional Release despite a write-up on the Form 1A that the brakes were weak in the right cockpit and the directional gyro was inoperative in the left cockpit. The brakes had not been checked by maintenance personnel, the directional gyro had not been replaced.

After flourishing his signature on the 1A, this pilot took off and flew on an IFR flight plan.

Later, a landing was made on a 3,600-foot runway. The right brake failed in both cockpits during the landing roll.

The pilot attempted to groundloop the F-82 at the end of the runway, but the airplane turned only 70 degrees before the right gear folded. The wind at the time was six to 10 mph.

This was another accident waiting to happen, and it didn't have long to wait. Why did this pilot take such chances? Why did supervisory personnel allow this F-82 to be flown in such a condition? Why?



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