FLYING SAFETY

INSPECTOR GENERAL · U. S. AIR FORCE

WHEN THE GAGES SHOW TILT

page 6

FEBRUARY, 1952

DO YOU GAMBLE?

GAMBLING is a tradition with Americans. Our nation was founded on a gamble, and since then our forefathers have gambled their ways through life. They gambled that their crops would be fruitful, and when they failed, they made the same gamble the next year and the next, until their bets came through. They gambled in their business ventures. Many of them didn't make the grade, but many others succeeded to one degree or another.

Yes, our forefathers gambled to obtain success. But there was one important fact connected with their gambles which is not mentioned above. That is that before they placed their bets they carefully analyzed their chances of success. They studied the soil, climate and demands for their produce before they planted their crops. And they studied the potential markets for their products before they ventured into business.

It's a procedure that has proved sound and is still used today on an even larger scale. Would a banker risk a loan to a man who wanted to use the money to plant an orange grove in Alaska? No, of course not. That wouldn't even be considered a gamble. The cards are stacked the wrong way before the hand is dealt — and everyone knows it. If the man wanted to plant wheat in Kansas or cotton in Mississippi, then he might get the loan. It would be a gamble, possibly a good one.

How does this involve flying and flying safety? Look at it this way. Flying, just like most other things in life is a gamble. It can be a good or a bad gamble, depending upon the men who are taking the risk.

If a pilot neglects the common sense rules of safety, if he allows his proficiency to drop into the red, he is the type of man who might want to raise oranges in Alaska. If he abides by the rules and makes certain that his flying skill is kept at the peak, maybe he'd make a good Mississippi cotton grower.

It's the same for the crews who maintain the airplane. If they know their business and are conscientious about doing their work, then the pilot who makes them the loan of his life when he flies their planes is taking a good risk.

What makes flying a good gamble is that there are so many aces you can hold. There are more than four to the deck. And seldom do you have to hold all the aces to get through okay. Instrument proficiency is a good ace to keep handy, even though you don't need it on every flight. Adeptness at emergency procedures is another ace you should always hold, even though you seldom need it. Good weather briefings, a meticulous flight plan, adequate preflight checks, and expert navigation techniques are other aces a pilot should always hold. And he doesn't have to be a card shark to hold them, either. It's up to him.

If you hold all the aces, you're stacking the cards your way. But stacking the cards on the safety side is fair in this flying gamble. It's a gamble you can't afford to lose. And it's one you shouldn't lose.

THIS MONTH

On page 6, you'll find the story we promised you on recovering from unusual positions on instruments. Again, we thank the USAF Instrument Pilot School for preparing this article. The procedures given should do much to prevent accidents which occur when wingmen find themselves separated from their leaders in weather with none of the gages inspiring that "straight and level feeling." "They Bring 'Em Back Alive," which starts on page 18, is the story of Air Rescue Service. This Organization has done outstanding work in the Korean affair. Up to 1 January, 1952, over 3,500 men in the Korean area owed their lives to the efficiency and courage of ARS. Air Rescue's accomplishments should provide encouragement to all Airmen, in all parts of the globe.

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WELL DONE

We've been receiving a few letters from individuals recommending pilots and crewmembers for Well Done salutes in FLYING SAFETY. We're very happy to receive these recommendations and would like to get more. But when you send them in, please try to include a head and shoulders photo of the man you recommend. Any photo will do, just so it shows the face clearly. If we don't get the photo, we have to write for it and the "salute" is delayed for a month or so.

• • •

NEXT MONTH

We plan another series of photos of Eddie Bracken for the March issue of FLYING SAFETY. This time, Eddie will show the trouble that a man can get into while trying to put on a parachute when he doesn't know which end is up. Perhaps you don't need any chute donning instruction, but after you see Bracken's troubles we'll bet you will brief your passengers a little more thoroughly—the way you're supposed to. Did someone say, "Who'll be the gal for the inside back cover?" That's a secret we want to keep a little longer. Besides we don't know yet. Is there anyone you'd particularly like to see?

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RETRACTION RETRACTED

Last month in this column, we apologized all over the place for printing in the November issue a FEAF TIP to the effect that the gas caps on F-80 tiptanks not be tightened until just before a takeoff. At that time this procedure had not been approved for use in units outside of FEAF. Now we take back that apology, because AMC has approved the practice. Just one thing, be sure you tighten the caps before you push that throttle forward. We want to help prevent accidents, not cause them.

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COVER

The cover for this issue of FLYING SAFETY isn't supposed to go with any particular article. We just thought it was a good silhouette photo with sufficient possible interpretations that each of you can look at it in the light which pleases you best.

Flying Safety

DEPARTMENT OF THE AIR FORCE
THE INSPECTOR GENERAL, USAF

Major General Victor E. Bertrandias
Deputy Inspector General

DIRECTORATE OF
FLIGHT SAFETY RESEARCH
Norton Air Force Base, California

Brigadier General Richard J. O'Keefe, Director
Lt. Col. John R. Dahlstrom, Supervisor of
Flight Safety Publications

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— c o n t e n t s —

Editor
Lt. Col. L. G. Taylor

Art Editor
Capt. F. M. Edwards

Associate Editor
Capt. Ben H. Newby

Associate Editor
2nd Lt. James A. Hamilton

Circulation Manager
M/Sgt. Wm. C. Hautz

The printing of this publication has been approved by the Director of the Bureau of the Budget.

I'M A FIGHTER PILOT . . . a jet fighter pilot. To be specific, I fly F-84's.

I take umbrage with those remarks that people keep tossing at my expanding visage. Sure, I'm losing my hair, but it's not because I'm growing old, nor is it due to extensive combat duty. It's not caused by flying the F-84. Not directly, that is.

I got the normal amount of experience for a guy my age—nine to ten years' service—a tour of combat duty in Europe—a tour behind a few desks—a little occupation duty, and another tour with the U.N. Police Force in Chosan.

In fact, I just got back from that last junket and joined this group here.

Brother, it's back to Stateside duty again. We got to go to those prolonged briefings by Operations Officers, Flying Safety Meetings and all that stuff. Course, I've been around long enough to know that a good bit of this lecturing pays off. The youngsters need that sort of thing.

But here—Stateside, I guess it's because these Operations Officers are all field grade that they have to yak a little longer than normal. Take the officer who runs our show. . . .

"Five times," he says, "Five times pilots from this group go visiting friendly neighbors in their little Thunderjets—and on each of those specific junkets somebody blows the squibs on the canopy. Five different people go to all the trouble of opening the red emergency canopy opening panel, fighting the yards of red cloth streamers to get the toggle switch which blows the squibs and consequently blows the canopy right off the tracks."

Well—he drones on and on about the repair work. The pilot who has to sit tight until he can get new squibs —new shear pins—new rollers, etc. Just so he can go home to the spouse and offspring.

I'm listening. I'm paying attention all the time, but I keep thinking how dumb can some of these kids get—just letting anyone at these other flying yards fool around their aircraft. Me—in a strange place—I'm going to stay with that aircraft right on the wing until it's completely serviced—and the fuel service men are through and have gone about their business. Those kids who let strangers around their aircraft just aren't thinkin'.

As soon as this jargon marathon is over, I check with the scheduling board and find that I'm due for a day-night cross-country. It's one of those "name your own destination, but get two hours night time on the way home" flights.

I got buddies from the land of Ichiban out at Langburn—it's the right distance from home, and they have the facilities, so there I go.

I get to Langburn (the reason for the use of this fictitious name will be quickly obvious) and of course, with a good head on my big, broad shoulders—I keep careful tab on the boys in the yellow trucks as they come up. I show how I want the jet refueled, and I stay on the wing and don't let them touch anything they don't have to touch. I hand 'em the Form 1 so they can make the proper entries, then I put the Form back in the aircraft, and I close the canopy.

With a free mind, I go to the phone, call friends, get an invite to dinner, and spend about two pleasant hours.

Back in Langburn Base Ops I file my clearance and start out the door when the dispatcher calls, "Sir—I don't think your aircraft is ready to go. Something's wrong with the canopy."

I exploded. "What"??

PILOTS GROW OLD

By Major Martin A. Foster

A Mostly True Story Showing One Reason Why Pilots Lose Their Hair

"Well, sir, it seems that the electrical man in Alert wanted to see an F-84," and . . ."

He tells the story, and I keep myself somewhat under control, and go check the damage. I need new rollers, new pins, and new squibs. I'm calm, but I don't want to talk to the guy in Alert right now. I wire home for some replacement parts, then go check in at the BOQ.

While washing my hands, I notice quite a few strands of my golden tresses are entwined in my fingers. My face is growing longer.

Next morning, my parts arrive—ferried in by none other than my own dear loquacious Ops Officer in his own F-84. He makes a few snide remarks about me not paying attention when he lectures on canopies. I stew slightly—and steer him over to the Alert crew where we find the lad who makes yesterday's mistake.

He gives us this "I'm not the regular guy who works on Alert" routine and takes us to the two F-84's to tell us how it happened.

It's incredible—that story—incredible, realistic story telling. The electrician opens the red canopy panel to show us and his own supervisor what switch he is talking about—the panel and its long red streamer drop out—the airman is keeping up a steady stream of rationalizing patter. I'm watching him—and suddenly I'm petrified—I hear a deafening scream—"DON'T!". . . . My throat hurts and I know I'm the screamer, but it's too late—the airman demonstrates too well—he pushes that switch again—and another jet canopy hops from its rails. Two F-84's sans rollers, squibs, and pins. Only, this time it's worse. The rear squib blows a bolt down through the sheet metal almost into the main fuel cell.

All else is anticlimactic. I find more curly locks in my fingers and notice that the Major has a new bald spot too—F-84 pilots growing old and hairless.

It's not easy to eject canopy accidentally, but it's been done

We get home and begin writing letters to the CO at Langburn, where four of our seven canopy incidents took place; to Flight Safety, and to several other people who might be able to do something.

The caustic comments about my receding hairline are increasing.

Major Foster's canopy jettison story sounds like a fancy piece of imagination, doesn't it? Well, it's not. Although they've been dressed up a little bit, the events which he writes about happened almost as he relates them. The major says he was not personally involved, but that a couple other pilots of his wing, the 20th Fighter Bomber at Shaw AFB, had a very similar experience.

And he says that such experiences are not isolated occurrences. They don't happen at just one base. And they don't happen just once in a while.

The point of this story is that maybe alert crews aren't getting the supervision, training and experience they should. No one can argue that a basic trainee is qualified to perform alert duties on transient aircraft. It's an important job. It's a job which can mean the difference between life and death for a pilot. Experienced, well-qualified individuals must be chosen to fill these jobs.

The manner in which an alert crewman performs his duties is a direct reflection of the efficiency of the entire base so far as the transient pilot is concerned. Often, a pilot who lands for refueling has no personal contact with anyone on the base except operations and weather personnel and the alert crew. His impression of the people who service his plane may be his impression of the entire base.

Alert crews must be carefully chosen, well trained and properly supervised. Make sure they do their jobs safely and efficiently. You'll have a better base and we'll all have a better Air Force.

Our thanks go to Major Foster for this story. Our hopes for improvement in the quality of alert crews go to "Langburn" AFB.

ALPHABET SOUP

Or What Does The "Q" Mean To You?

By Captain Arthur J. DeBorger

DID YOU EVER take a close look at those garbled portions of the alphabet at the end of a weather sequence? Looks like a 10-year-old got hold of the typewriter and indiscriminately pounded on the keys. Would the following apparently senseless drivel mean anything to you if you saw it tacked onto the weather sequence of the field where you want, with all your heart, to RON tonight:

QURUQ QAREN QIROS?

Don't hit the panic button, yet. Stick with me for a few minutes. You might come out of this smelling like a rose.

From September until March every year, the continental United States is invaded by that migratory Gobble-de-Gook. We know almost nothing about its sex life, but we have, through many years of intensive observation learned to interpret its strange language.

Put away your Sanscrit dictionary; you won't need it. But get out the ANC manual and check over the code devised by Doctor Nienhampadoddle. The good doctor spent the better part of his life observing the Gobble-de-Gook, and the results of his frustrated life have been published for you.

Back in the early days of flying, when all the pilot required was a good seat, a lot of guts, and a smattering of grey matter between the ears, flying was a snap. You didn't take off for Podunk Hollow Army Air Base until you could see the wind sock at Podunk.

But someone invented a bigger and better engine, which was installed in a bigger airplane; then larger gas tanks were added and the crowning blow came with the addition of instruments, which, when properly interpreted, permitted the aviator to drive his aircraft from point A to point B, even when the ground couldn't be seen.

Don't know who first decided that something should be done to warn possible transients that unforeseen hazards existed at their destination, but something had to be done to keep the "glamour boys" from nosing up on runway 18-36 which was temporarily turned into a haven for elephants, this being the simplest way to get rid of the petunias growing up through the cracks. And it was humiliating to grease the B-18 in and wind up with the crew smelling like petunias, to say the least, as they ignominiously crawled out of the resulting mess.

"They should have Notices out to all us Airmen," the Chorus cried; and brilliant Lt. Dumbjohn came up with NOTAM (Author's Note: Abbreviations have always been popular with the American populace such as WPA, OPA, TVA, TWA, AA and GIRLS) which meant, very simply, Notices to Airmen.

Because the boys were digging their spurs into the floorboards of their aerial steeds for longer periods of time, weather reporting and forecasting (Author's Note: Forecast—to foresee, a prediction, a prophesy) (Ed. Note to Author: You'd best steer clear of weather offices till this dies down), became necessary, and what better means was available to insert these tidbits of information for the competent, brilliant, able and foolhardy "Hot-Rocks" who infest the upper air region?

Foolhardy, yes, definitely! Because the notices were preceded by a Q and the other four letters were a code, many pilots skimmed right over them with the same amount of interest they accorded a bespectacled, buck-toothed, bowlegged . . . well. Consequently, when they arrived at their destination they climbed upon their indignation to register protest after protest at the Base Operations Officer because no one told them elephants were grazing on the runways, and transient quarters were non-existent. "Someone should have told us," they ranted and raved, and not until they were hoarse was the Operations Officer able to inform them that a NOTAM had been sent out, in some cases, days ago, publishing this poop for one and all to read and be warned.

The NOTAM is a year-round advisory aid, just like radio ranges, to assist, not confuse this modern, all-weather Air Force. How the pilot uses his aids to navigation depends upon his proficiency. It may determine whether or not he lands at his destination or control-crashes at some indeterminate spot en route. NOTAMs also advise him of conditions, usually temporary, which are not published in the Airman's Guide, or the Radio Facility Chart.

Few pilots will take off when the gas gages read empty. But all too many ignore the Gobble-de-Gook because it is too much trouble to take thirty seconds to decode it, and besides if it were really important, the information would be published instead of being added to the weather sequence or in the NOTAM file. The results of this attitude have at times been downright fatally disastrous.

All significant changes are published in the Airman's Guide and other publications, when their temporary nature lasts more than seven days. But let's face it; the cost would be prohibitive to publish the Guide every two days, like a newspaper, when temporary conditions can relatively inexpensively be brought to the pilots' attention through NOTAMs.

Doctor Nienhampadoddle (sometimes called simply The Doc) discovered that the Gobble-de-Gook will always start his NOTAM code with his mating call of "Q." The next two letters refer to one of the three primary categories: Radio Aids, Lighting Facilities, Aerodromes (and Search & Rescue). The last two letters in this strange five letter call of the Gobble-de-Gook tells what is wrong with what.

To go back to the beginning of this article, the code QURUQ means that the runways are covered with ice. Usually, the numbers of the covered runways are also given. The first Q in this group, incidentally, designates the NOTAM. The second code group, QAREN means that the range is not operating until further notice (usually the range frequency is also given).

And the third hunk of confusion, QIROS means—but, you drop into your Base Operations, grab the code and figure that one out for yourself.

(Author's Note: This will probably be the first time in the history of many pilots that they have come face to face, bare-knuckled, and fought to a victory, the NOTAM code.)

In addition to insuring that your aircraft is equipped to fly through the worst Mother Nature can dish out these winter months, add the checking of NOTAMs to your "pre-filing of the flight plan check list." The surprise of finding that all runways are covered with clear ice won't be too much of a shock if you discover it while still draped over the counter in a warm operations, instead of squirming in your chute harness, low on go-juice, enough ice on your wings to fill highball glasses stretched around the world twice, with very little choice, except going down.

The NOTAM will not tell you what the club is having for dinner, or what headliner is playing at the local burlesque house, but it will inform you of conditions incident to the safe operation of aircraft.

Would you say that's important?

NOTAMS, whether found in the convenient file in operations or in remarks section of weather sequence, are pilot's guide to safety.

WHEN THE GAGES SHOW . . .

'TILT'

By Instructor Staff
Instrument Pilot School
Tyndall AFB, Florida

MANY A FLYING "bull session" has begun or ended with the ever-fearful: "There I was at 20,000 feet, flat on my back, hanging by my throat mike." Years ago, it was always good for a laugh.

Then came jets—and the story could have changed to: ". . . there I was at 40,000 feet, standing on my tailpipe, with my eyeballs frozen to the canopy." It's a lot better story, but nobody is telling it. It probably wouldn't get a chuckle today because there's nothing very amusing about an unusual flight attitude in a jet . . . in weather. Ask anybody who has had the experience.

Reports of accident investigating boards consistently show that the outstanding cause of flying accidents in weather is poor pilot technique or lack of instrument proficiency. "Lost control in flight" is a phrase which frequently appears in these reports. The frequency of occurrence of unusual flight attitudes from which pilots make improper recoveries or make no recoveries at all, warrants a closer look at the technique for regaining control of your aircraft when an unusual attitude occurs.

An unusual attitude is any attitude of the aircraft not required for normal instrument flight. You can find yourself in such an attitude as a result of one or more factors such as turbulence, vertigo, pilot confusion, getting separated from your formation or carelessness in cross-checking flight instruments. Obviously getting into an unusual attitude is fairly simple. Now, how do you get out?

Although no two unusual attitudes will be exactly the same, there are certain general rules that apply in recovering from any unusual attitude. For instance, all recoveries are accomplished through proper interpretation of the four "old faithfuls" of the instrument panel, the airspeed indicator, altimeter, turn and bank indicator and the vertical speed indicator, together with the application of control pressures as dictated by the readings of these instruments.

Also, in all unusual attitude recoveries, the airspeed indicator is the primary instrument for power control. (Primary instrument is defined as that instrument which gives the most pertinent information for any particular maneuver and is usually the one that should be held at a constant indication. For example, the altimeter is the primary instrument for pitch attitude in level flight.) The airspeed indicator and the altimeter together are primary instruments for the control of the pitch attitude of the aircraft, while the needle and ball instrument is the primary instrument for bank control. The vertical speed indicator is used as a supporting pitch instrument.

Naturally, when an unusual attitude occurs, corrective action must be prompt. However, no corrective action should be taken until the flight instruments have been observed and a general picture of the attitude of the aircraft has been obtained.

When this has been done, there are two general procedures that can then be used for recovery. One is a "high airspeed recovery," the other is a "low airspeed

Here's What to Do When Your Instruments Show You've Strayed From the Straight and Level—

recovery." The reading on the airspeed indicator and its trend of movement dictates which of these procedures should be used.

If the airspeed is higher than that desired and/or its trend of movement is toward an indication that is higher than desired, the high airspeed recovery should be used.

In this recovery, power is reduced and dive flaps are lowered simultaneously to prevent excessive airspeed and loss of altitude. Next, the banking attitude is corrected to maintain straight flight by centering the needle and ball. Then back pressure is applied to raise the nose of the aircraft to the horizon.

This sequence of power, bank and pitch correction is very important. Although all components of control are changed almost simultaneously with only a very slight lead of one over the other, the lead must be in the above order. Correcting bank prior to correcting pitch eliminates the possibility of pulling the aircraft into a tight spiral.

As the initial pressures are applied to start the recovery, observe the flight instruments closely to avoid overcontrolling. During the first stage of the recovery, disregard the attitude gyro and the slave gyro since these instruments are difficult to interpret when the aircraft is in an unusual attitude. The indications of the attitude gyro can easily confuse a pilot. This confusion can cause improper recovery action to be taken. In addition, the attitude gyro goes through a gimble lock when the aircraft is in vertical flight, either straight up or straight down. When this occurs, the ball of the instrument rotates 180° and if followed, a vertical roll would result and end either in a stall or in an extreme loss of altitude.

When the turn needle and ball are centered, the wings are level. Ease pressures in smoothly and cross-check the needle closely when correcting the bank to prevent

banking in the opposite direction. This can occur readily due to the high rate of roll available in a jet. If it does occur, you have the same problem you started with only in the opposite direction.

During recovery, the movements of the airspeed indicator and the altimeter will stop prior to reversing their direction. At the instant that these movements stop, the aircraft is passing through the level flight pitch attitude for the airspeed shown on the airspeed indicator at that time. In establishing a level flight attitude, observe the airspeed indicator and the altimeter closely to prevent entering an uncontrolled climb. The accelerometer may be cross-checked also to prevent excessive G-loads.

As you approach level flight attitude, use the attitude gyro and the slave gyro to assist in full recovery. The flight attitude shown on the attitude gyro at this time may not be the true attitude due to the precession of this gyro in the recovery. Therefore, use your other flight instruments *with* the attitude gyro in determining what attitude to maintain.

The "low airspeed recovery" differs only slightly from the high. Once again the airspeed indicator is observed as soon as the unusual attitude is detected. If the indication is lower than desired and/or the trend is toward an indication that is lower than desired, power is increased and forward pressure is applied to prevent stalling. Then the bank attitude is corrected, by centering the needle and ball. The sequence then is power, pitch and bank correction and is equally as important as in the high airspeed recovery.

Use 100 per cent RPM when applying power as the rate of acceleration in jet aircraft is comparatively low. Forward pressure should be applied cautiously as prolonged, excessive forward pressure may lead to flameout. Hold this pressure until the airspeed stops decreasing and shows an increase, then let the airspeed increase to safe airspeed prior to applying back pressure for level out. The same primary instruments are used in the low airspeed recovery as were used in the high airspeed recovery. As you approach level flight, use the attitude gyro and slave gyro to assist in full recovery.

If a squint at the airspeed indicator reveals that the airspeed is extremely low, indicating a stall, normal stall recovery is used. This is usually the same as normal low airspeed recovery. Let sufficient airspeed build up in this recovery before applying back pressure, to avoid further stalls and loss of altitude.

To recover from a spin, use the mechanical procedure employed in visual flight. A spin is indicated by low airspeed, extreme displacement of the needle and ball, and loss of altitude apparent on the altimeter.

When you have your aircraft under full control, start a climb or descent back to your original altitude and return to your original heading . . . but gently, giving yourself a chance to relax.

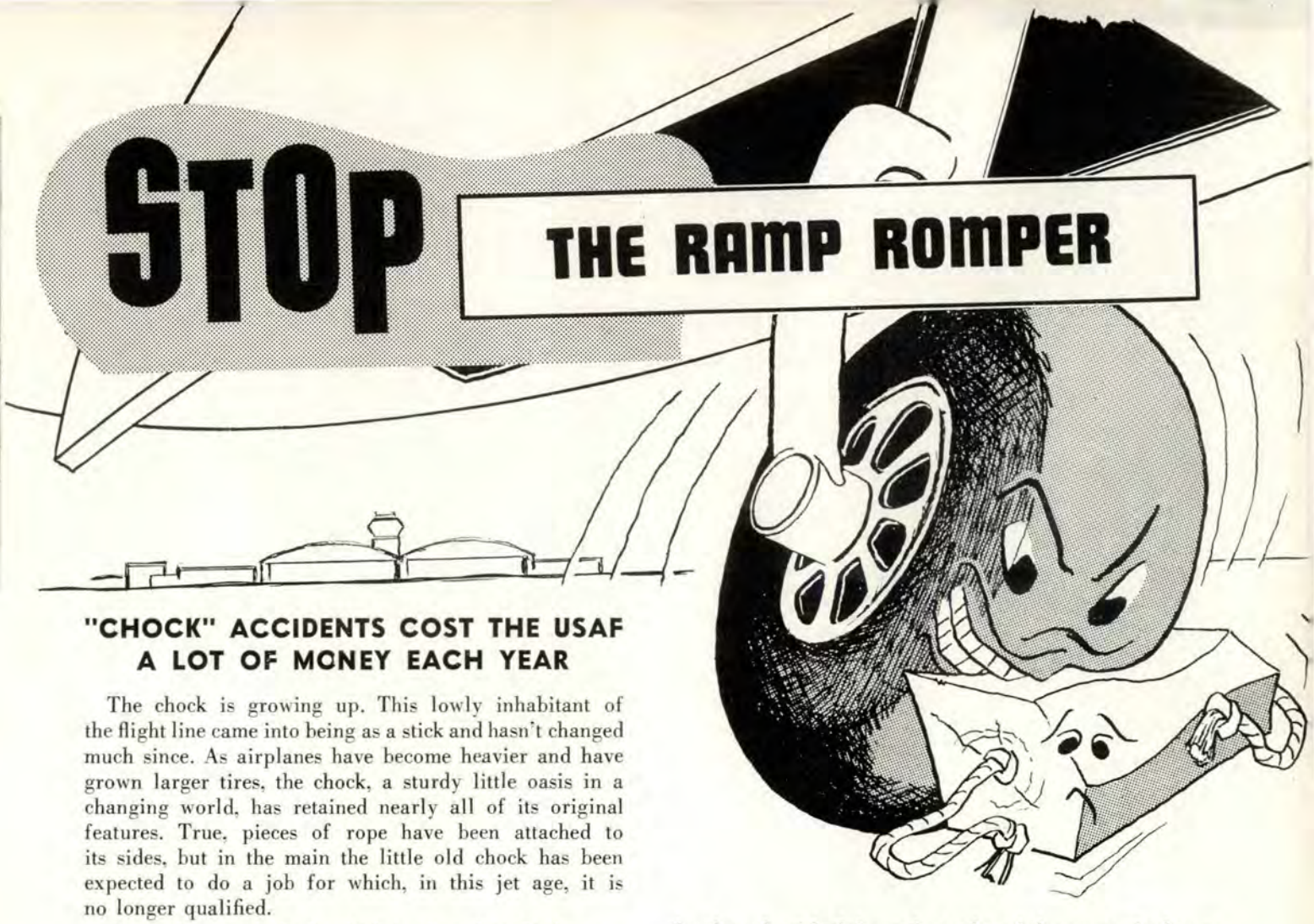
Boiled down, three general rules apply in recovery from all unusual positions:

- First, look at the airspeed indicator immediately upon detecting any unusual attitude of flight.
- If the airspeed is high or shows a trend of going too high, simultaneously reduce power and extend dive flaps, correct the bank and then correct the pitch.
- If the airspeed is low, or shows a trend of going too low, simultaneously increase power and correct pitch, and then correct the bank attitude.

Familiarity with these three rules may mean the difference between tumbling through space like a freely falling body or recovering smoothly from that unusual attitude. It may mean saving an expensive aircraft for Uncle Sam and . . . just incidentally, it may mean saving that expensive fixture that connects the stick and throttle with a bucket seat.

Airplanes used by the USAF Instrument School include the B-25, T-28, and T-33. Students log plenty of instrument hours before they make the transition into jets.

STOP THE RAMP ROMPER



"CHOCK" ACCIDENTS COST THE USAF A LOT OF MONEY EACH YEAR

The chock is growing up. This lowly inhabitant of the flight line came into being as a stick and hasn't changed much since. As airplanes have become heavier and have grown larger tires, the chock, a sturdy little oasis in a changing world, has retained nearly all of its original features. True, pieces of rope have been attached to its sides, but in the main the little old chock has been expected to do a job for which, in this jet age, it is no longer qualified.

A metal type of chock which is shaped to fit the contour of airplane wheels and which is a lightweight to handle, is a favorite but does not exist on enough flight lines to be really well known. It is obtainable by requisition only, and seems to be particularly well suited to cold weather operations.

The chock's ropes, when attached to both blocks, are supposed to keep them from being blown away by prop blast or from floating away if the ramp is flooded. In many cases no slots for the rope connection have been cut and the result is not an efficient chock, but a piece of wood with rope dangling grotesquely from both ends.

The little chock was getting along very well until heavier aircraft and big tires entered its life. The familiar orange face, battered and gouged but willing, was usually the first to greet newcomers at every base.

Recently, old style chocks have been blamed for quite a few accidents . . . "too small for the job." The big airplanes, during preflight run-up, just hop right over them as though they weren't there. In most cases this has occurred when the crew chief or other qualified personnel advanced the throttles for a power check.

Failure of the chock to "hold" has resulted in the chock-hopping airplane running into others in the parking area. This began to happen a little too consistently a few months ago. Statistics were studied; recommendations made, and as a result the chock in its familiar small form has been banished from the realm of the super-airplanes.

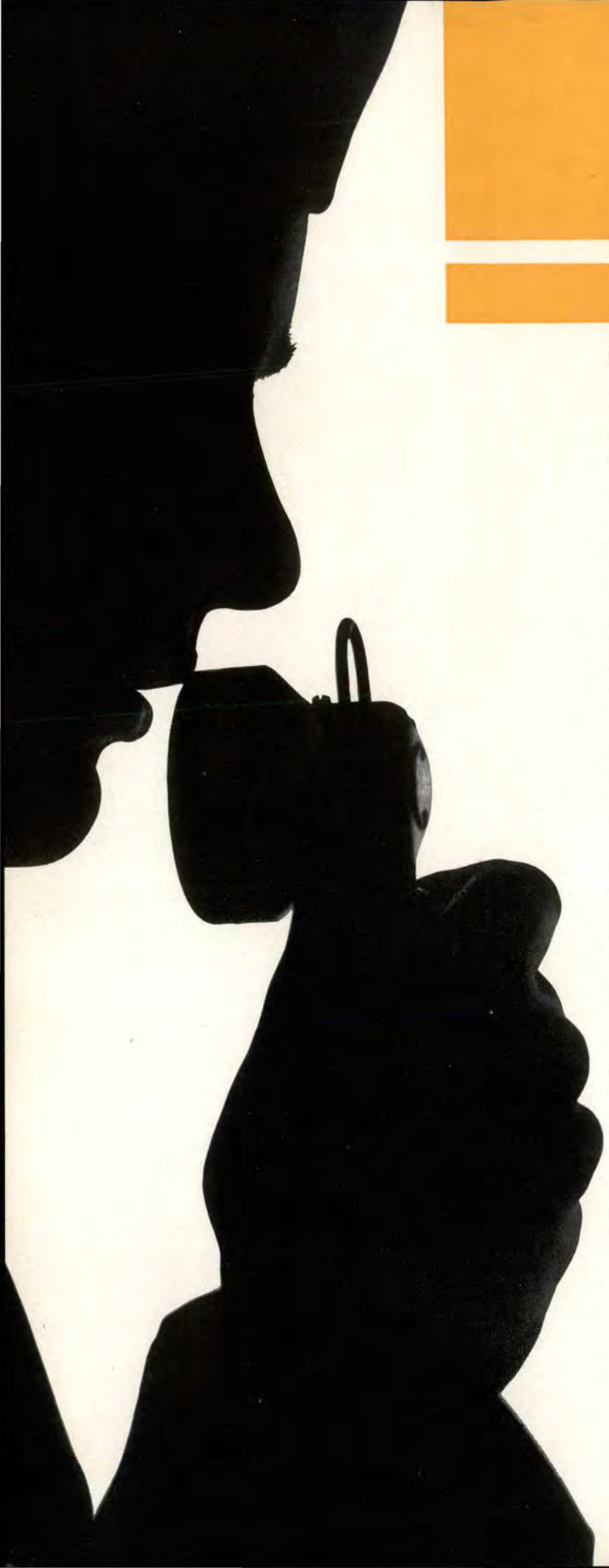
When treated right, they are still the best friends of the ordinary airplane under conditions of high winds, just parked for the night or during those pre-dawn starts.

AMC has indicated that designs for three different size chocks will soon be available. The chocks will be locally manufactured at each base. TO 01-1-50, "Ground Handling of Aircraft," will be revised to avoid any confusion as to exactly which size chock to use with which size tire, as the chocks are designed to be used only with specific sized tires.

Only qualified personnel, as stated in AFR 62-10, should be at the controls during preflight run-up. Even the biggest of chocks can't do it all, especially if it's trying to hold back an aircraft with throttles full forward, as in a recent accident. "I was thinking of steering the plane instead of stopping it," said the T/Sgt, when questioned as to why—once the plane had jumped the chocks—he didn't retard the throttles and cut the switches.

A few cases of brake malfunction have occurred during run-up, leading to the chock jumping. Run-ups under these conditions in crowded parking areas are especially undesirable. In one case four airplanes were damaged as a result of one jumping the chocks.

The combination of proper usage, increased care during run-up and the larger chocks should eliminate this spurt of ramp-romping airplanes.



PLAIN

you can help hold down

"AND THERE HE WAS, this man from Mars, yakking about railroading the go-handle and causing a blow-out in his squirt job at 30,000 feet. . . ." All of which may be perfectly plain, understandable aviation slanguage to today's younger generation of jet jockies doing some hangar flying after their missions. But for air to ground, or vice versa, communications, just plain old-fashioned clear talk may suit tower operators, ground controllers and CAA men a lot better.

Not that these boys wouldn't understand—they don't care how it's said—ungrammatical, Brooklynese or Southern drawl—just so the pilot or aircrewman says it clearly. Of course, if the man doing the talking knows his short and standard procedures, it will help to speed up services and avoid possible misunderstandings. And what and how the message is said may go toward the development of a standardized aviation language.

For the past year the matter of speech intelligibility has been a question of great importance in aviation generally. For that matter, it still is of wide concern. What is being done is another question. Speech studies are still under way by the USAF and CAA, and when completed will be used in compiling a standardized aviation vocabulary.

In connection with this, one thousand words to hear are being searched out to make up the official language for airmen. One thousand words are needed with sounds that can not be confused with the sounds of other words.

These words must also have certain precise meanings. If they can be found, Civil Aeronautics Administration experts believe that a substantial reduction in air accidents will result from making sure that air-to-ground and other communications are clearly and completely understood.

They are certain that under some circumstances an increase in the intelligibility of a term is equal to an increase in the signal strength. Accordingly, a staff of experts in the psychological section of the CAA is hard after words that will penetrate the defects of radio transmission and the noise of aircraft operation and also survive the accents of sectional pronunciation.

Wartime investigations proved that some words such as woodpecker, dynamite, cornfield, highway, and porcupine are very intelligible but that words such as food, rings, Eleanor, nine and dry are very susceptible to confusion.

On the model of the successful phonetic ABC's of Able,

TALK *for* PILOTS

radio chatter if you know what to say and how to say it!

Baker and Charlie, the CAA began to hunt for good words by examining words frequently used in traffic control communications. Hundreds of the recording loops on which the communications of tower operators are recorded are being checked to build up a list of the terms most frequently used.

After undergoing intelligibility tests, the words failing to measure up to the standards of clarity are to be replaced by acceptable synonyms. Through this process a standard vocabulary may be built up.

For instance, one of the first studies undertaken was the determination of the real vocabulary used in plane-to-tower and tower-to-plane conversation. An analysis of 10,000 words accumulated from the control tower at Bolling Field showed 5,000 common words of which ten per cent made up 50 per cent of the messages.

Other facts brought out in the initial studies and which emphasize the need for more plain talk from both pilots and tower operators were the high amounts of low-intelligibility and garbled messages between the airplane and tower.

Apparently, these troubles were caused at least in part by improperly tuned radio equipment and poorly adjusted throat mikes. Other factors included mumbled enunciation of words and bad microphone technique. All of which dumps a large part of the voice procedure problem back into the laps of the pilot and radioman, who must solve two problems for successful voice transmission. These are how to speak, and what to say.

For good speaking over interphone and radio with maximum effectiveness over aircraft noises, there are four factors which must be considered: loudness, rate of speaking, pronunciation, and patterns of speech. A little practice on these four most important factors will develop proper habits of speech that can be used automatically under all flight conditions.

Speaking with the right degree of loudness and recognizing the volume needed is made easier by the fact that the most efficient level of loudness for the interphone is the same level that is most effective for VHF command sets as well as for medium and HF command sets.

Intelligibility increases with loudness up to the level just below shouting. Speaking loudly, but without extreme effort, results in maximum intelligibility. Thorough tests have shown that to use a normal tone in speaking into the mike is wholly wrong. To be clearly intelligible, the spoken sound must be louder at the face of the mike than surrounding noises. The amplifier will raise the

Don't follow this exaggerated "I'll-make-'em-hear-me-regardless" technique. Note the high-riding headset. Below, is the Crystal Ball, or "I-see-he-can-hear" style.

The above style is more like it. Now the man can talk loud for an easier transmission and he can receive clearly with a better adjusted headset.

voice level, but only to the same degree that it raises all other sound reaching it.

Speech should be as distinct as possible. Shouting will distort the sounds and overload the system besides wearing out the voice. Experience has shown that it is better to speak too loudly than not to speak loudly enough. One of the best ways the pilot can judge his speech is to listen to the side tone in the earphones. A good, clear side tone is the most reliable check of correct loudness. The effective level of loudness is the same for all three types of standard USAF microphones, hand-held, throat, and oxygen mask. At low altitudes the mask microphone operates almost as well with a low level of loudness but at high altitudes the high level of loudness used with other types of microphones is necessary.

Adequate loudness must be maintained throughout the message. Now, this doesn't mean that every word must be spoken at the same level. An effective level must be held, and key words made just a little louder. Here, the speaker should be careful not to fade out on the end of phrases or sentences and do without the "ers" and "uhs" between words. The voice should follow naturally the meaning of the message.

In learning the best rate of speaking, there is no one fixed rate that is best for all occasions. The correct rate depends upon the speaker, the message, and the transmission and reception. Some people can be understood when they speak rapidly; others must slow down. Generally messages are spoken at a rate somewhere between 115 and 150 words per minute. For the pilot brushing up on his voice procedures, the most effective rate will probably fall between these two figures, and closer to the lower one.

However, intelligibility is the goal, and here are some main points to work on:

- Talk slowly enough so there is time to pronounce each word distinctly.
- Talk fast enough to sound natural.
- Talk slowly enough for the listener to absorb the message.
- Group words for clear expression; pause between ideas.
- Allow a little more time on key words and phrases.

Speaking with loudness may be learned and the effective rate developed, and still the message may not be completely intelligent. A third factor for good transmission is clear and distinct pronunciation of all sounds, syllables and words.

The good technique here is to give all words the correct pronunciation and avoid accents and local "color." In short, speak American. Unaccented syllables must be pronounced also. Do not slur your words, or make with the gangster talk—out of the corner of your mouth.

No matter how loud and clear the words are, the listener will have trouble understanding the meaning of the message if the words are not grouped the way he is accustomed to hearing them. All messages fall into "natural phrase" groups. The listener expects word groups to be punctuated by slight pauses. If these pauses are run over, and ideas slurred together, he finds it hard to grasp the meaning. Overly long pauses are irritating and confusing. Stumbling around, adding the "uhs" and "wells" just makes the confusion worse.

In using the aircraft microphone there is a definite technique developed through experience and methods that have been found to be most effective. Here are some of these mike "do's" and "don'ts" to remember:

- Hold the microphone in front of the mouth and lightly touching the lips.
- Speak clearly and directly into the microphone.
- Don't hold the mike at an angle.
- Don't use the thumb or the fingers as a shield between lips and microphone.
- Don't turn the head without keeping the microphone in front of the lips.
- Throat mikes should be worn so that the two buttons straddle the "Adam's Apple," with the strap making a tight fit. Don't wear the mike with slack straps.
- Be sure the radio equipment is tuned properly.

The voice of the pilot plays an important part in the control of air traffic and cannot be over-emphasized. Standardized voice procedures must be used where possible to relieve some of the overload on communication channels.

All pilots should polish up their voice techniques to save time and increase their readibility. With the increasing number of aircraft in the air, holding communications to a minimum becomes a necessary safety factor. The pilot should know in advance exactly *what* he wants to say and *how* to say it.

DON'T BE A JABBER JAW

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 and begins his novelette entitled, "Position Report."

The plot is always the same, and it runs on and on into hundreds of words:

"Baltimore Radio, Baltimore Radio, this is AF 1234, AF 1234, calling Baltimore Radio. Come in please Baltimore Radio. AF 1234. Over . . ."

"Roger, Baltimore Radio, this is AF 1234 calling you on Able Channel. We have a position report to give you. Are you ready to copy: Over . . ."

"Roger, Baltimore Radio, this is AF 1234, AF 1234, 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 AFB, Mitchel AFB. Our . . . uh . . . destination is . . . uh . . . Greenville, South Carolina, destination Greenville, South Carolina. At the present time, we are cruising Item Fox Roger. We estimate . . . uh . . . Washington Radio Range Station at . . . uh . . . just a minute . . . uh . . ." (holds mike button down for 30 seconds) . . . "we estimate Washington Radio Range at two-four, two-four. Did you get all that, Baltimore Radio? This is AF 1234."

Of course, Baltimore 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 that this type of report can cause everyone else flying in the vicinity an awful lot of trouble. 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. When he monopolizes the air so that other pilots cannot make their contacts with radio stations to give their reports and receive instructions, mid-air collisions could easily result.

For the benefit of pilots like the longwinded individual just described, it is unnecessary to call "Baltimore Radio, Baltimore Radio" over and over. Station operators know their names 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. And even if other pilots can't hear you, they know that some clown is busy, because they can't contact the radio station themselves.

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.

"Baltimore Radio, AF 1234, Beltsville one-two, four thousand, IFR to Greenville, Washington two-four."

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

But JABBER JAW doesn't have to be in the air to prove his worth. He can do just as well over a common telephone. He might go on something like this:

"Uhhh, hello Flight Service, I'm at Tucson, Arizona, uhh at the Municipal Airport, uhh I'm flying AF 199, aah C, that's C like in Charlie 45, that's four five, and I'd like to plan a flight or rather file a flight plan to Bakersfield, California."

The Dispatcher replied, "All right, sir, how did you wish to go?"

"Uhh, what do you mean, How?"

"Well, sir, did you want to go airways or direct?"

"Oh, well, I guess I'll go airways."

"All right, sir. What airways did you want?"

"Oh, err, well, I dunno. What airways do you have running up thataway?"

Telephone technique of this sort produces Jabber-Jaw.

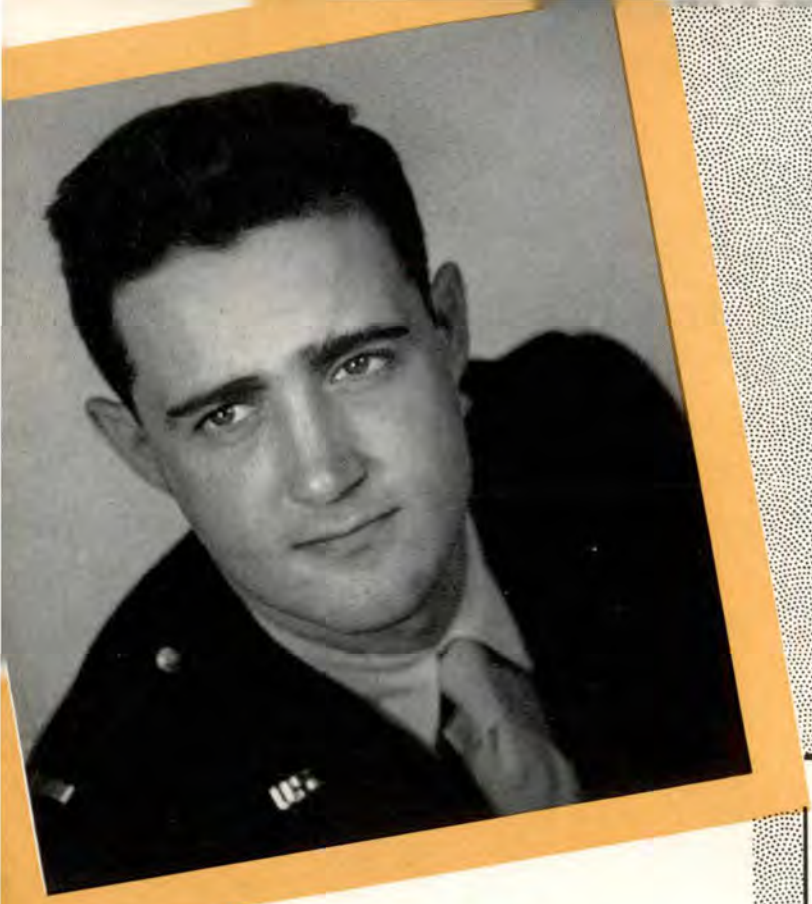
Improve your telephone technique. Immediately your radiotelephone technique will start paying dividends. Shorter, clearer, concise reports and requests for information will permit twice the number of transmissions on the limited ground/air channels available.

Increasing frequency of aircraft movement and higher flight altitudes contribute toward congestion of airways frequency. It is self-evident that individual pilot technique cannot stop with flying the aircraft but should include good radiotelephone technique.

Check up on your telephone technique as well as your position reporting technique. Make certain you are not JABBER-JAW.

Well

EACH DAY that goes by, some member of the Air Force in some part of the globe performs an outstanding feat of airmanship or exhibits professional skill far above the average. Although it is impossible to recognize each of these accomplishments in this publication, it is for such examples that



1st Lt. Theodore J. Baader

AS HE TURNED onto the initial approach for a practice landing in his F-84, Lt. Baader heard a loud explosion in the cockpit. He found that the canopy glass had blown out. A second later the canopy frame blew off, missing Baader's head by inches. The frame struck and sheared off approximately two-thirds of the vertical stabilizer and rudder. The impact changed the position of the remaining portion of the stabilizer, causing the airplane to skid violently. Lt. Baader slowed the airplane down and experimented with the controls. He found that he could control the plane by holding full right rudder, and chose to land immediately. His radio was useless because the antenna was housed in the damaged rudder. Lt. Baader extended his gear at 200 mph, touched down on the runway at about 170 mph, and completed the landing successfully.

Lt. Baader's calm appraisal of the situation and the superior judgment which he exercised in landing his crippled F-84 saved a valuable airplane which will fly again.

77th Fighter Bomber Sqdn.
20th Fighter Bomber Group
Shaw AFB, So. Carolina.

T/Sgt. Ira C. Cox

DURING an overwater flight in a C-74, all four propellers suddenly "ran away" without warning. Three of them were brought under control, but the prop on number 4 engine had to be feathered. Soon thereafter, fire was detected in the No. 4 nacelle, and the fire extinguisher was actuated. A short time later, the fire warning light for No. 4 engine again came on. Sgts. Cox and Voorhees immediately proceeded through the wing to the nacelle and with a hand fire extinguisher put

Well Done

the Well Done section is intended. On these two pages, we pay tribute to a pilot, two airmen, and a Medical Officer for superior performance in their respective fields. The fact that this can be done indicates that above all else, teamwork is the main ingredient for real safety in flight.

Maj. John P. Stapp

IN THE INTEREST of greater safety for pilots and crewmembers, this Medical officer recently subjected himself to the greatest known G-forces ever voluntarily encountered by a human. Major Stapp conducted his tests while riding a specially constructed, rocket-propelled sled which ran on a 2000-foot track. The rockets propelled the sled to a velocity of 170 mph within 500 feet; the sled then "coasted" to a speed of 154 mph before being suddenly braked down to a speed of 35 mph. This deceleration took place in a distance of only 31 feet and a time of .228 seconds. During the deceleration, Major Stapp's body was subjected to as high as 45 G's. These tests revealed that a human body can withstand much greater forces for a short time than was previously thought possible. Although these experiments are not comparable to those which a pilot will experience in tight turns or pull-ups, the G-forces encountered do approximate those present in a crash landing. The data gathered should prove invaluable in crash research study. Major Stapp is to be commended not only for his professional ability but also for his unselfish attitude in using himself as a guinea pig for safety.

Wright Air Development Center
Air Research and Development Command.

T/Sgt. James T. Voorhees

out the residual fire which was found in the vicinity of the carburetor and main gas outlet. After returning to the cockpit, these two airmen clipped all wires to the No. 4 prop booster motor which had previously been observed smoking. The flight was then completed successfully. Knowing their airplane paid off for these airmen.

1703rd ATG, MATS
Continental Division
Brookley AFB, Ala.

THE CASE OF THE

Failed Horizon

Groundborne Airplanes Which Simulate the Real Thing Permit Aircrews to Crash Painlessly

THE CREW SETTLED into their seats and began to check the various controls preparatory to take-off. The pilot ordered the engineer to start the engines. One at a time the engines coughed, sputtered and roared into life. Control Tower clearance received, orders were given to "pull" the battery cart and ground emergency fire-fighting equipment. Upon release of the brakes, the big B-50D taxied to the end of the runway and the engines were run up. Magnetos tested, the switches were checked again. Then the engines accelerated and the plane gathered speed. The altimeter started climbing and the wheels were retracted. As the high-pitched whine of the wingflap motors was heard, the pilot checked his artificial horizon.

It was sagging! The plane was getting into a steep turn! The pilot twisted his wheel to get level but when he was square with the horizon, it tilted some more. Soon the plane cartwheeled into the ground and a B-50D was splattered all over the countryside. The power in the artificial horizon had failed. The pilot had not checked his turn-and-bank indicator and had flown his plane into disaster.

But hold it! Nobody was hurt. No equipment was lost. This was a training crew flying the B-50D simulator at Walker Air Force Base, one of several simulators the Air Force is now using to train pilots and crews.

A flight simulator is the exact reproduction of the flight characteristics and instrumentation of any particular plane. The first flight simulator was put together by Richard C. Dehmel of Short Hills, New Jersey, about 11 years ago. Beginning as a comparatively simple simulator for radio-beam signals, it has grown into an electronic miracle. Dehmel was working in Los Angeles and learned to fly on the side. The flying school asked him to make a simulator for radio-beam signals. The school's instructors were highly impressed by it and asked him to add a control stick and rudder. He did this and then they wanted a clock for timed turns, and then a turn-and-bank. Slowly the spare-time gadget grew into the complicated mechanism that it is today.

It's an IFR wring-out for the pilot who sharpens up in one of the first USAF all-weather F-86D electronic flight simulators. This trainer is the first to simulate two planes in flight.

The B-50D simulator consists of four cabinets:

- the power supply
- the aerodynamic functions or flight cabinet
- the numbers 1 and 4 engines, and
- the numbers 2 and 3 engines.

These are all electronic computers with the exception of the power supply unit. An array of servo mechanisms and amplifiers instantly, automatically and continuously solve differential equations relative to flight and engine power. The solutions to these problems activate the gages in the cockpit.

For example, the pilot pulls back the yoke and starts a climbing turn. Of course the simulator does not move, but control movement tilts the horizon bar just so, displaces the turn needle and slows the airspeed indicator. The rate-of-climb needle goes up and the compass revolves slowly to track the changes in the magnetic course.

The B-50D simulator has places to train a pilot, co-pilot and flight engineer simultaneously, plus a seat for an instructor who introduces the various flight problems into the instruments. The F-86D simulator has places for two instructors: one for radar operation and the control of a simulated target plane which is attacked.

Radio units within the simulators duplicate the navigational and approach systems normally found within the Air Force. For radio aids to navigation the simulator has low frequency range, VAR, ILS, ADF, aural null, fan marker, Z marker and five different identification signals for low frequency range. These radio aids are automatic and may be used simultaneously with the low frequency radio range.

Duplicating the B-50D even to size is this Dehmel flight simulator. This trainer permits simultaneous training of pilot, copilot and engineer.

From the "trouble panel" in the instructors end of the simulator all kinds of malfunctions can be set up before the flight begins and many flight problems and emergencies introduced after the flight has started. Stick forces, variable with the airspeed; flying through cloud formations, lightning, increasing dawn or the approach of night; various flight attitudes; engine fires; failures in fuel systems, instruments and landing gear; depletion of fuel supply; change of gross weight and center of gravity location; high cylinder head temperatures; circuit brake overloads; flameouts; control boost and high speed stalls are only some of the many emergencies that can be introduced into the simulators—not to mention the duplication of traffic and letdown problems of almost every area in the world.

When a crew steps out of the simulator, they have flown an actual airplane to all intents and purposes. Nothing that takes place, or which would be done in a real plane is any different in the simulator. Mechanical difficulties, weather troubles, or the failure of the crew to function correctly will all have identical results in the simulator as in an actual aircraft.

So far as the crew is concerned, about the only differences from actual flight are the psychological sense of safety, the absence of a feeling of physical acceleration, and the fact that landings require imagination on the part of the pilot and instructor. Even the landings condition the pilot for blind landings and the flight is made so real by engine noise—either the roar of the piston type or the scream of the jet, the screech of the tires meeting the runway, and the authenticity of controls and instruments, that the illusion of flying is almost perfect.

The advantages of simulated flight are practically unlimited. The cost ratio of a plane to a simulator is 10 to 1. The fuel saving in training crews amounts to thousands of gallons. It is estimated that 50 to 75 per cent of transition flight time in the air can be saved. If the training program requires it, operation can be continuous. Normal time losses due to inclement weather, ground maneuvering, and mechanical troubles are not encountered.

Safety is probably the primary advantage. The training produces men who act automatically in all emergencies and gives inexperienced and transitional pilots invaluable instruction in real-life emergencies and contingencies. Some of these are actually more real in the simulator than they would be in the air. Also, certain problems can be isolated and learned in parts, and the performance of the crew as a team can be watched.

The Air Force now has contracts out for the simulation of the B-47B, the F-89C and the F-86D. Plans are also being laid to produce simulators for B-36, B-50, C-97 and C-124 aircraft and large scale production of the C-11A (F-80), the first trainer ever developed for jets and the first ever to be quantity produced, is under way.

Perhaps it is not too optimistic to look forward to the day when none of the now numerous training and transitional crashes will cost any money or equipment. Best of all, they will be strictly of the walk-away type.

The F-86D Sabre all-weather flight simulator built for the Air Force is the first to simulate two planes in flight—the one being flown and an approaching enemy plane. Thus, Sabre jet pilots training in the new all-weather interceptor can learn how to handle their high speed planes without leaving the ground, and will be able to bag an enemy plane approaching at the speed of sound, with the advantage of getting another chance if they miss.


THEY BRING 'EM BACK
Alive!

The Work of The Air Rescue Service Has Been Remarkable—Korea Has Emphasized This

THE FLIGHT of F-51's was half way between Chinnampo and Pyongyong when a Communist flak trap was sprung. The engine of one of the planes was struck, forcing the pilot to bail out at 700 feet. He landed in the Taedong River where he inflated his life raft only to be forced to hide behind it until darkness to avoid enemy fire from the banks. To stay in his position, he had to swim against the current, holding the raft by a rope between his teeth.

Meanwhile members of the downed pilot's flight began strafing the enemy ground positions and radioed for aid. Captain John J. Najarian of the 3rd Air Rescue Squadron and his crew were just leaving the field after completing a rescue mission when the alert was received. They were back in their SA-16 amphibian and off the ground in less than ten minutes, as the light of day faded.

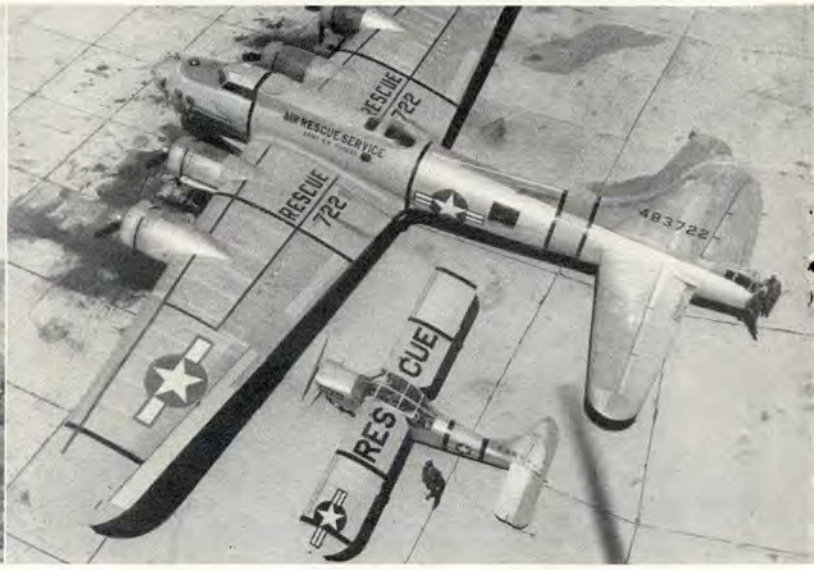
When the SA-16 reached the scene, it was growing dark. One of the airborne fighters provided the only illumination with its single landing light while the other provided fire cover on the approach.

An instrument letdown was accomplished. Descending at 200 feet per minute, Captain Najarian applied full reverse pitch to the propellers as soon as he struck the river, and the amphib settled down in the shallow, slow moving stream. With the enemy firing from the banks continuously, he taxied up the river to meet the swimming pilot who was pulled on board by the crew.

Immediately, the Captain prepared for takeoff with only a dim view of a small peninsula a short distance up the river marking the horizon. In order to get clear of the stream, he had to start his takeoff downstream using the slightly darker mass of the promontory for a horizon. He then made a 90-degree right turn to finish his run across the current. Upon reaching flying speed, the amphib was lifted into the air and was met by anti-aircraft fire. The aircraft was banked sharply away from the flak, and climbed for altitude under full power.

This was only one of the many saves the 3rd Air Rescue Squadron has made as part of the Air Rescue Service, which provides air search and rescue service to military and civil aviation in all parts of the globe. Though emphasized by war and established primarily to aid military airmen, the ARS is morally obligated to perform humanitarian work at the scene of any disaster where its tools can be of assistance. This extracurricular type of activity has in the past called for aiding in the search for a lost youngster in the woods of Maine, the search for and rescue of a "flying" American missionary in the Philippines, the delivery of food, medicine and doctors to snowbound ranches and communities in the Midwest, and the

In Korea, helicopters have proved most valuable for bringing downed airmen back alive.



Air Rescue Service planes come in all shapes and sizes. Each has a specific task to do.

jumping of a para-doctor to aid a crashed civilian pilot on a frozen lake in the Pacific Northwest.

Rescue by air has played an important role during the last ten years in both war and peace. Today the aircraft is regarded as an instrument of mercy as well as a facility of transportation and destruction. The mere existence of air rescue facilities has inspired confidence in many persons using aircraft for one reason or another. To minimize losses of expensively trained crewmen, particularly during the war when trained manpower and time were of primary importance, the USAF organized and developed air rescue squadrons for the purpose of rescuing aircrews and passengers who were forced down, crashed, or bailed out of their aircraft. These rescue units were organized, equipped and trained so that they could operate aerial and ground rescue equipment effectively on any part of the globe—in arctic, temperate and tropical climates, and on land and sea.

The organization that is now Air Rescue Service was activated as the 62nd AF Base Unit in January, 1946, at Andrews Air Force Base, Maryland, under the Continental Air Forces. This unit was responsible for rescue activities within the United States. Rescue responsibilities prior to this time had rested with the various continental Air Forces within their designated areas. Air Rescue Service became part of the Air Transport Command on 13 March 1946 and today remains a part of its successor, the Military Air Transport Service.

The first expansion of Air Rescue Service to overseas areas came in May and June of 1948, when search and rescue responsibilities in the Atlantic and Middle East areas were transferred to the ARS. A year later, Air Rescue squadrons in the Pacific and Far East were transferred to the Service and in September, 1949, Caribbean Rescue was brought into the fold and an Air Rescue squadron was organized in Europe. The 10th Air Rescue Squadron in Alaska was transferred to ARS in July, 1950, completing the transfer of all organized AR squadrons (a total of eight) within the USAF to the Air Rescue Service organization. This total was recently increased to ten and two more squadrons are scheduled to be organized soon, to be based at other strategic locations.

Each of the present day squadrons is composed of four flights that are equipped with the trained personnel and equipment necessary to furnish search and rescue support within their normal areas of responsibility. If fully equipped and manned, a flight has four airborne lifeboat carriers (SB-29 or SB-17) or four amphibians (SA-10 or SA-16), one transport aircraft (C-82 or C-47), and two helicopters (H-5), plus ground motored equipment which might include 6 x 6 trucks, weapons carriers, jeeps and caterpillar-tread "weasels." Personnel, including rescue control men, land rescue and survival specialists and para-rescue team members, have available such tools as walkie-talkies, snow shoes, mountain climbing gear and any other equipment required for rescue work under all conditions.

Each flight maintains a rescue control center and at least one air crew and aircraft on alert around the clock, seven days a week. The rescue control center is equipped with all the materials for planning a mission and is connected by radio, interphone and/or commercial lines with Flight Service centers, airport towers, Oceanic Air Traffic Control and Civil Aeronautics Administration radio control centers, Coast Guard and other rescue organizations, so that immediate information can be relayed, and rapid liaison effected with all cooperating agencies. The Air Rescue Service coordinates with all other rescue agencies, military, civilian or foreign, and has the authority to call on any other USAF activity for assistance.

THE ALERT—Here's what an ARS rescue control center does upon receiving word that a plane is overdue

Ground rescue equipment is also necessary. Sometimes aircraft are used only in support.

Pararescue crews are vital to mission of ARS. This photo shows typical crew ready to go.

or missing in flight: Orders an extended communications check of all airports along the plane's route; alerts other cooperating agencies; alerts crews and makes preliminary search plans which include the gathering of all available material concerning the aircraft and pilot, the en route weather and any other data necessary. If the communications check does not reveal the whereabouts of the aircraft, it is listed as missing. Many alerts are also received on distresses or disasters not involving aircraft, such as lost personnel, floods, forest fires, emergency evacuations and so on. Though not a part of the air rescue mission, appropriate action is taken in such instances in accordance with established procedures.

THE SEARCH—As soon as an aircraft is listed as missing, the search is begun. The first areas to be searched are usually along the proposed flight path, areas where extreme weather conditions exist, and in any mountains in the proximity. This search is conducted by all available aircraft and other agencies, and in most cases is complemented by a ground interrogation search of land rescue teams. Para-rescue teams, land rescue teams and spare crewmembers are on a 24-hour standby basis until needed. Specific areas of search are allocated and a master chart of all searched areas is maintained by the rescue control center or by the mission commander when the operation is being directed from a temporary ARS base of operations.

Various types of search patterns are employed, depending on terrain, visibility and other factors, with special attention given to heavily wooded areas and other areas where it is difficult to see the ground from the air. When a crash site has been reported, immediate verification is attempted by helicopters, liaison aircraft or land rescue teams, unless the wreckage is definitely known to be that of the missing aircraft.

THE RESCUE — While this verification is taking place, rescue planes are swinging into action. In all instances it is presumed that there are survivors until there is absolute knowledge to the contrary. The rescue controller or mission commander decides by what means the rescue should be made. Often, it is decided that two or more types should be employed. To reach the scene, rescue teams might have to employ any method of travel from conventional aircraft, helicopters or amphibs, to parachute, horseback or travel on foot, or a combination of any of these. Evacuation from the crash may vary from slow foot travel, with a patient on a make-shift stretcher, to being lifted aboard a hovering helicopter by means of a hydraulic hoist. The final act of the rescue party is to paint a large yellow cross on or near the wreckage, making it readily identifiable as an old crash in subsequent operations in that area.

Of course locating the accident and being able to reach the scene with the greatest possible speed are of utmost importance if lives are to be saved. Constant research and development is being conducted to produce the best possible equipment to accomplish these tasks. Typical of the products of this effort are the triphibious SA-16, the crash locator beacon and the type A4-Lifeboat.

The SA-16 is a triple-threat aircraft designed to land on water, land, and snow or ice. Thus it eliminates the necessity of retaining specialized ARS aircraft for use in different world areas. Probably the most advantageous feature is that it allows the pilot to "air select" the correct gear for landing on any of the three type surfaces. The addition of the skid and other components necessary for triphibious configuration adds only 695 pounds of gross weight to the plane which is by far the lowest penalty ever paid for snow or ice capability and which has an almost negligible effect on the operational utility of the plane.

Still in the development stage is the crash locator

beacon. The finished product is envisioned as a complete, compact, self contained radio transmitter, weighing approximately 50 pounds. Contained within the set will be the transmitting circuits, power supply and a parachute. The pilot may manually eject the beacon from the aircraft or, if time does not permit, the unit will automatically eject itself when the plane contacts the earth. Its parachute will then open and lower the unit to the ground where it will erect itself, extend the antenna and commence transmissions, completely unattended. It will transmit alternately in periods of two or three minutes, on high frequency to obtain maximum range, and then on very high frequency to allow close-in accuracy for an aircraft homing on the signal. The sequence transmitted will consist of the call-sign of the aircraft, a letter or number indicating the length of time it has been in operation and a series of dashes to allow direction finders to take bearings on the signal.

To back up the beacon, an automatic direction finding station is nearing completion which will be installed at various locations to enable signals to be received from various air routes. When a beacon signal is received, a bearing on the signal is automatically recorded and relayed to an evaluation center which, with reports from other receiving units, will establish a position of the disaster and forward it to the rescuing agency.

The A-4 Lifeboat was designed to meet the following specifications:

- An airborne, free-fall personnel lifeboat that could be dropped from an altitude of 25 to 100 feet into an open sea from an aircraft traveling at a speed of up to 180 knots.
- Carried either internally in an aircraft possessing bomb racks capable of carrying 2000 pounds, or externally on a similar bomb rack attached to the wing.
- Be capable of being carried in a collapsed state, and self-inflating after landing in the water.
- Be capable of cruising under internal power for an extended distance.
- Be equipped with supplies and equipment sufficient to sustain eight men for five days.
- Be electronically controllable from the air.

Living proof of the development of new procedures and techniques is the 3rd Air Rescue Squadron now operating in Korea. One of the first Air Force units to engage actively in support of combat operations against the enemy, this organization made a rapid transition from peacetime to wartime operations. To satisfy combat requirements, an amphibian and a helicopter detachment were organized to augment the capabilities of this squadron.

One of the major new doctrines developed was the recognition and application of the utility of the helicopter. Due to its ability to land in the most inaccessible locations, the helicopter has virtually replaced the liaison type of aircraft as a means of rescuing and evacuating downed air crewmen as well as wounded ground personnel from front line areas and enemy territory. It has also proved its worth in moving blood plasma and other vitally needed supplies to forward areas. The amphibious capabilities of the SA-16 were exploited in operations off the Korean coast and in the Sea of Japan. Boat carrier aircraft are used to escort bomber and airborne missions, as orbits, and to provide route coverage for increased transport traffic.

So effective is the 3rd AR Squadron in using these techniques that it has become the most decorated unit in the Far East Air Force. These tactics have become widely recognized and standardized and will serve as patterns for future operations.

Ingenuity and daring on the part of both pilots and

Liaison type planes are handy for low altitude search and for landings where larger planes can't get in. Up to 1 January 1952, ARS had rescued over 3,500 men in Korea. This included all UN troops of all services.

crews have played a major role in the outstanding work of the rescue squadrons. To rescue a jet pilot down in a Korean mud flat, Capt. Robert C. Mason, Reno, Nevada, forced his SA-16 twenty-five yards into the mud. After picking up the downed airman, he reversed his props and backed out the way he came in. The whole operation was accomplished under continuous threat of concentrated enemy fire.

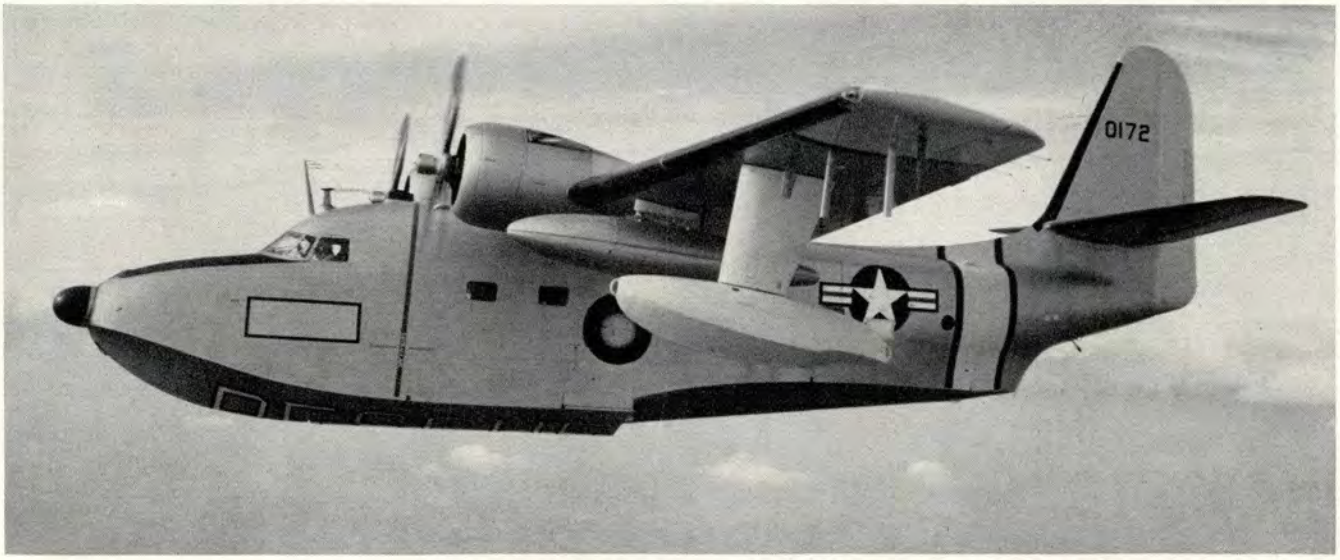
Another SA-16 was in the air five minutes after receiving an alert about a Marine pilot down in enemy held waters. With the pilot floating ever closer to the enemy shore, the Albatross landed, taxied over to the man and in less than six minutes after the initial landing was winging safely toward home base.

One pilot was in the water only three minutes when he was downed on a strafing mission off the western coast of Korea. Capt. Charles J. Fisher brought his SA-16 in to pick up the flyer, landing in swells of up to six feet. After attempting four takeoffs in the heavy seas, Captain Fisher finally taxied to island-sheltered water for a successful takeoff.

Not all of the mercy missions accomplished by the ARS are for the military. Life rafts were dropped to the victims of last year's flood in Kansas by SA-16s from Flight "D" of the 4th Air Rescue Squadron stationed at Lowry AFB, Colorado. The amphibs were unable to land because of floating debris. Notable service was rendered by an H-5 of the ARS in the stopping of a dangerous yellow fever epidemic in Costa Rica recently. The H-5 transported doctors and other medical personnel to isolated areas to administer medical aid as well as provide vaccinations for the inhabitants. The helicopter made 42 landings over an area covering more than 6000 square miles in a period of 11 days.

So reads the record of the Air Rescue Service. A record that pays off in the highest medium of exchange—saved lives.

For overwater search, SB-17's are equipped with life boats which can be dropped to survivors of air or marine accidents.



Amphibious SA-16 is not a new plane but the uses to which it is put by ARS in rescuing men from watery graves make it one of the most valuable of rescue tools. It has proved its worth in many rough water landings.

MOUNTAIN WINDS

When It's Breezy In The Mountains, Stay Out of Trouble By Flying High.

OPERATIONAL STUDIES indicate that the mechanical effect of wind velocities of 25 miles per hour or less over mountain crests is not likely to produce very adverse flying conditions when allowance is made for clearance of the highest terrain by a thousand feet or more. Above 25 mph winds may produce unfavorable conditions, particularly for planes of low performance. But usually winds reach 40 to 50 mph over mountain crests before causing critical conditions for transport aircraft.

The general effects of a strong wind over a mountain barrier are an accelerated wind speed and reduced pressure over the crest, and turbulence and relatively low pressure on the lee side. It must be realized that much higher wind velocities may exist over the mountains than would be directly indicated by upper air reports that have been obtained from stations removed from the mountain influence. Also the increase of wind velocity over the crest is likely to be greater over a ridge when the wind is blowing at right angles to it than over an isolated peak, as in the latter case much of the air can escape around the peak and does not have to be lifted over as in the case of the ridge.

We will assume that we have a high wind velocity over a mountain barrier. The contour of the mountain appears to have a decided effect on the pattern of turbulence set up on the lee side. Down-slope wind usually occurs in the lower altitudes on or near the lee slope. Standing waves, which are ripples in the airstream similar to those caused by a submerged rock in fast moving water, may occur to the lee of either irregular precipitous mountains or those that are relatively smooth with gentle slopes. The present indications are that an abrupt change in temperature lapse rate over the mountain and/or wind shear have a decided influence on the generation of standing waves. In actual cases both are likely to be present.

Both terrain and meteorological conditions influence the spacing of waves, which may vary by several miles. The waves tend to diminish in size for each succeeding wave to leeward. The first of these waves are likely to be two or more times as high as the mountain producing them. If the air is very dry there may be no visual evidence of standing waves even though they may be present and well developed. However, if the air is moist, indications of wave development may be present in the form of lenticular clouds and/or long rolls of rather evenly spaced clouds leeward and roughly parallel to the mountain ridge.

It was stated that contour appears to have an important effect on lee flow patterns. Therefore, let us first consider in more detail the flow pattern resulting from strong winds over a mountain ridge with generally smooth and gentle slopes. Under these conditions the lee flow acts most nearly as an air foil, particularly where the slope does not exceed one to three. According to Gordon Manley, an eminent meteorologist, this presents the best situation for the development of a regular pattern of long standing waves leeward from the mountain.

Also, Manley found that relatively low windspeeds are likely to result in stable waves, whereas greater windspeeds over the mountain cause the waves to travel, but at a lesser speed than the wind through them.

Further, Manley concluded that the spacing between wave crests varied with the depth of the accelerated flow over the mountain; namely, greater depth resulted in wider spacing of waves.

With further reference to the tendency for the lee flow to act as an air foil when the slope is relatively smooth and not steeper than one to three, it is interesting to note that this corresponds very closely with the upper limits of the change in direction of air flow over the upper surface of air foils on low-speed airplanes, above which the air flow is broken up into turbulent eddies. While it appears that the simplest lee flow pattern exists in connection with the smooth gently sloping ridges, down drafts immediately in the lee, as well as the turbulence connected with the standing waves, if they exist, may be quite severe during periods of high winds over those ridges.

Now let us consider the effect on lee-slope wind flow of the precipitous and irregular type of mountain. This type of terrain is unfavorable for air foil flow, and instead turbulent eddies are generated along the lee slope, developing in a generally chaotic pattern. Vortices sometimes develop in the lee of the crest. Standing waves may also develop, but are likely to be broken up into peaks or segments rather than the long parallel type described in connection with the less precipitous terrain.

Waves in connection with this type of terrain are reported to become well developed in the Owens Valley near Bishop, Calif., particularly during and just after cold-front passages. Soaring pilots are reported to have ascended to above 30,000 feet in these waves, with every indication that a much higher altitude could have been obtained. One pilot used a P-38 as a soaring plane in one of these waves and was able to maintain altitude over a considerable period of time with the propellers feathered.

The U. S. Weather Bureau has made some special research on the effect on pressure of a strong wind flow over mountain barriers. Particular study was made of the effect on Mt. Washington, N. H., and Mt. Laguna, Calif., from which points considerable observational material was available. This study indicated that the effect of wind on reduction of pressure over the crest was proportional to the square of the windspeed. Wind velocities of 100 mph were the highest velocities studied, as observational data are very scarce for higher velocities.

At both Mt. Washington and Mt. Laguna a local reduction in pressure was indicated for a wind velocity of 100 mph that would result in an indicated altimeter reading 370 feet higher than the actual altitude. This figure was for air that was not saturated. It was found that in the case of Mt. Laguna the discrepancy was nearly doubled when the air was saturated. This would account for a discrepancy of about 740 feet on the danger side. Both Mt. Washington and Mt. Laguna are between 6,000 and 7,000 feet high. Indications are that greater magnitude variations would exist over higher mountains.

It was thought that the wind tunnel might be useful for study of wind and its effect on pressure over mountainous terrain. However, the scale difference between the model and the mountain is tremendous, and additional factors such as gravity, coriolis force, stability, etc., cannot be easily simulated. The result was that no reliable correlations have been found.

A few years ago investigation was made of the pressure pattern of a particular mountain area during various wind conditions by means of measurements at the surface and in planes in flight. Later a wind-tunnel model was made of the same mountain area, and the wind velocities and directions were duplicated in the tunnel. In some cases pressure variations measured in the model were of opposite sign to those obtained in the mountain area. This indicates the unreliability of model measurements for this purpose.

Now, what is the pattern and magnitude of pressure variations that occur in the turbulent area in the lee of a mountain during high winds? That is really the vital question, as factual information aloft is far too meager to form definite conclusions. There have been reports from pilots flying in the vicinity of mountains of what appear to be fantastically large discrepancies in altimeter readings.

Some pilots in the Owens Valley in California, on the lee side of the Sierras, have reported marked changes in temperature when entering standing waves, and in one case reported that the altimeter read nearly 3,000 feet higher than the actual altitude. We cannot ignore the possibility that pressure variations of quite large magnitude may exist as a lee effect during high winds over the mountains. Research in its present stage of development does not contain definite factual data for acceptance or rejection of those large reported variations.

Measurements from ground stations in lee of mountains do not indicate local changes in pressure that would account for an error of several thousand feet in indicated altitude, nor has the rather meager research done in planes given results that indicate exceptionally large pressure variations.

We do know that relatively low pressure develops in the lee of mountains during high winds; also, some of the factors that result in lowered pressure over a mountaintop exist on the crests of the standing waves, so that in the absence of authentic measurements we could expect lower pressure and consequently an indicated altitude higher than the actual when flying through the crests of these waves. We cannot state what the possible magnitude of this variation might be. Also markedly lower pressure of very local extent would be expected in the alleged vortices.

There seems to be little doubt, that in some cases these conditions can and have caused crashes, particularly when the cruising level provides small clearances over the mountains. For example, strong westerly winds occur over the Rockies on numerous occasions, particularly from late fall to and including spring. Many pilots in the Denver area have, through experience, found it inadvisable and sometimes impossible to proceed toward the mountains immediately upon takeoff and gain sufficient altitude to clear the range during these high westerly winds. Instead they make their ascent over the plains to such an altitude that little or no additional climb is necessary to clear the mountain by a safe margin after proceeding westward.

It would appear that, whenever it is known or suspected that wind velocities are high over mountain peaks or ridges, more than the usual clearance should be planned, not only over the peaks or ridges but for 20 to 25 miles to the leeward. It further appears that safety becomes questionable during high winds over the mountains for flights with planes of slow climb and a low service ceiling, particularly in the high mountains of the west.

There is now a new research project called "The Sierra Wave Project" in the implementation stage for the investigation of turbulence and pressure anomaly effects. It is under the joint sponsorship of the Geophysical Directorate of the U. S. Air Force and the Office of Naval Research. The project is being set up in the Bishop, California, area, and by contract the University of California at Los Angeles has been given the general scientific direction and coordination of all project activities. This project will be the most comprehensive study of the subject ever undertaken in this country, and should yield much valuable information for making a more complete analysis of the effect of high winds over mountainous terrain.

Pilots can contribute much by reporting their experiences in these conditions, giving all possible information in regard to type of turbulence, wave indications, true and indicated altitude, and cloud forms, as well as the time, place, and date of occurrence.

MOUNTAIN WINDS . . .

Their Effects On Flight

Information in this article was extracted from Civil Aeronautics Board Safety Bulletin 186-51.

The RO can be a FLYING Safety Officer on each flight in the F-94

"SCRAMBLE"—When this word is passed down to the different Fighter Squadrons, it means only one thing to the alert fighter crews: an unidentified target has been picked up by radar by one of the GCI stations.

As the crews dash for their planes, the many hours of gunnery, instrument, and night flying, suddenly mold into the end product of getting to the target the fastest and safest way possible. All at once the job of flying safety officer seems to be a little less tiresome for he knows that the men under him have been working on the flying safety phase for weeks and now have it down to a point of perfection.

It wasn't always like this.

When All-Weather operations were first started in Orlando, Florida, in 1942, the Flying Safety Officers were keenly aware of the needed safety element in this type of work. Since that time they have striven continually to lessen the degree of danger involved and have progressed rapidly.

However, with electronic-eyed, radar-gunned, interceptor jets flying in all kinds of weather toward a target they rarely see, at near sonic speeds, it is definitely another story.

At McGuire Air Force Base, home of the 52nd Fighter-Interceptor Wing, the Flying Safety Officer is walking around with a satisfied smile and he has good reason too, for he sincerely believes that with the help of the air crews, he has a solution to one of the bigger safety problems encountered with the jets.

When the F-94's arrived more than a year ago he called the pilots and radar observers together and asked for suggestions for keeping the accident rate down in this brand new airplane. There undoubtedly would be "bugs" and the pilots would have to be ever alert whenever they climbed into the cockpit.

It was finally decided that the best man for keeping the pilot out of trouble would be the man guiding the

☆ CROSS FEED ☆

SOUP CUTTER—I am writing in regards to an item in "Cross Feed" of your issue of December, 1951. It was about the "Soup Cutter" described by Major Alfred Kaufman, Asst. Prof. Air Science & Tactics, Utah State Agricultural College.

At present, I am assigned as a Flight Maintenance Technician in the 1257th Air Transport Squadron and am flying C-54 aircraft on various trips in the Atlantic Division of MATS. With the advent of more bookkeeping and paper work due to increased emphasis on Cruise Control, I think that a chart similar to the one described by Major Kaufman would be a great boon to Flight Engineers and Technicians.

Would it be possible to get a picture or sample of the "Soup Cutter" so that we could adapt it to our needs for Cruise Control. Any help you can give us will be greatly appreciated.

—S/Sgt. Robert D. Stansbury
Westover AFB, Mass.

We have received several other letters asking for information about the Soup Cutter. Here's the man to contact, if you're interested: Capt. David F. McCallister, 1428 N. Sydenham St., Philadelphia 21, Pennsylvania. This is presented in the interest of safety. We are not in on any other profits.—Ed.

ADIZ—I read the November issue of FLYING SAFETY with my usual enthusiasm. My interest was further stimulated by the article on Air Defense Identification Zones, a subject which has been brought to my attention numerous times since the establishment of the new zones. A previous diligent search has failed to reveal a solution to this technical point.

I would appreciate information regarding the Air Force Reg, Directive, or what have you that authorizes flights through an ADIZ at any altitude without following ADIZ procedures published in the Radio Facility Chart, etc. My present assignment necessitates clearing flights through CAA facilities, and having the 4000-foot limitation brought to my attention every time I file "DVFR 2000" becomes increasingly irritating, involving a discussion of Air Force Regs and the points thereof that differ with those of CAA.

Having a distinct aversion to finding fault without offering a solution, I suggest an amendment to AFR 60-22 to include with the latitudinal and longitudinal dimensions of each ADIZ, the fact that these areas extend only from 4000 feet above the terrain to a specified altitude, or infinitum.

—Capt. Charles C. Posey
1114th Spec. Air Missions Sq.
O'Hare Field, Ill.

It would seem safe enough to take CAA's word for it that a VFR flight below 4,000 feet above the terrain in ADIZ's should not be considered a controlled flight. However, your recommendation regarding an amendment to AF Reg 60-22 has been directed to the proper agency in Air Force Headquarters for consideration.—Ed.

THE SENSATION OF THE STATION

(Author Unknown)

"I've flown 'em all, from then to now,
The big ones and the small.
I've looped and zoomed and dove and spun
And climbed them to a stall.

I've flown 'em into wind and storm,
Through thunderhead and rain,
And thrilled the folks who watched me roll
My wheels along their train.

I've chased the steers across the range,
The geese from off the bay.
I've flown between the Princeton Towers
When Harvard came to play.

I've clipped the wires from public poles,
The blossoms from the trees;
And scared my best friends half to death
With stunts far worse than these.

The rules and codes and zones they form
Are not for such as I,
Who, like the great wild eagles,
Fling my challenge to the sky.

A bold free spirit charging fierce,
Above the fallow land ——,
Say, don't you like these nice white flowers
I'm holding in my hand?"

HERE'S INITIATIVE! — The 104th Fighter Squadron, Maryland Air National Guard has begun an ambitious fighter-instrument program. In addition to classes, required reading of manuals and simulated instrument flight in T-6 and F-51 aircraft, greater stress has been placed upon Link time.

No training device is any better than the ability of the instructor to use that device. Therefore, a program is in progress to teach the Link Trainer Instructor the "realism" of actual instrument flight by having him fly hooded flights in the T-6 and C-47 type aircraft. The realization of the problems confronting a pilot in flight, not experienced while in the Link, are brought forcibly before the Link Instructor. The quality of his instruction is increased for he is able to project the "realism" of actual instrument flying into his synthetic trainer instruction. The Operations Officer rigged a tape recorder in a C-47 and recorded three entire GCA approaches. The Link Instructor could then, in the quiet of his leisure time, play back the recording and evaluate and simulate the realism of actual GCA technique, an art in itself.

No pilot and very few instrument programs can say that they are perfectly proficient in instrument flying. However, the more proficient a pilot becomes on the ground, the more qualified he is in the air to meet the challenge of all weather flying.

—Maj. Stanley L. Souders
Maryland ANG

Answers to quiz on page 27.

1. 500
2. 140
3. b
4. b
5. c
6. b
7. c
8. a
9. b

plane to the target from the rear cockpit, the radar observer.

By relying on the alertness of the radar observer in watching for emergencies, the pilot could spend more time in running the intercept.

This vigilance by the RO started immediately on the ground when he was required to attend all meetings on flying safety, engineering, communications and gunnery, scheduled for the pilots. It was felt that the more the RO knew about the aircraft, the more he could assist the pilot in the event of an emergency.

When a "scramble" is received and the interceptor crews dash to their planes, there is little time for a cockpit check. However, the two crewmembers have condensed the check into a short concise code. While the pilot is taxiing out to take off, he calls the check list off to his RO. If the pilot leaves anything out or in any way makes a mistake while going through this check, the RO calls him on it and upon landing the pilot quietly hands him a one dollar bill. This system has worked out very well for all concerned.

During the flight, the RO's duties do not end with the completion of the intercept; he must constantly compute the all important fuel consumption of the jet and advise the pilot when to switch tanks and also advise him the time of no return.

On training missions, the RO acts as the safety observer on instrument proficiency flights and on GCA runs. When up in the T-33 jet trainer, he is given stick time to gain first hand impressions of the problems confronting the pilot on actual intercept missions. In conjunction with his other duties, the radar observer is, in essence, a "Flying" Safety officer.

In the event an emergency develops with no resultant accident, a "near miss" board is convened. The pilot and RO are requested to submit a written report on the circumstances leading up to the emergency and what corrective action was taken. The emergency is thoroughly discussed and the findings are published for the benefit of the other crews in the squadrons.

Much of the excellent safety record at McGuire can be attributed directly to the RO, for when the wheels leave the ground, he does everything short of flying the plane in his efforts to help the pilot in avoiding emergencies.

Of the hundreds of reasons for a low accident rate, one of the most important is "morale." If the living and working conditions are ideal; if the officer-airman relations are excellent, and if there is a well rounded spiritual and recreational program in existence, there is no reason for anyone failing to do his part in the furtherance of the safety program. And McGuire's morale is the highest it has ever been.

Excellent flight and ground training of pilot personnel with the use of the radar observer as an auxiliary safety observer, combine to make the flying safety record of McGuire Air Force Base a point of pride to all personnel.

Know Your Airplane The C-47

(Answers on page 28)

1. The landing gear hydraulic lever may be placed in neutral after starting engines when the landing gear pressure is at least

350, 500, 750, 550 psi. (Choose One)

2. The best speed to penetrate "high gust" turbulent areas (gusts above 30 fps) is approximately

130, 140, 150, 160 mph. (Choose One)

3. If you are climbing and notice tail buffeting, the most logical reason would be:
   a. the flaps are down.
   b. the cowl flaps are open.
   c. the landing gear is down.
   d. the props are out of synchronization.

4. Normally the hydraulic hand pump emergency shut-off valve which is referred to as the star valve, is in the:
   a. open position.
   b. closed position.
   c. intermediate position.

5. Recommended maximum speed for lowering flaps is:
   a. 120 mph
   b. 117 mph
   c. 112 mph
   d. 125 mph

6. The engine nacelle fire extinguisher controls are located:
   a. in the radio compartment.
   b. on the floor between the pilot and copilot.
   c. in the cabin on the left side.
   d. near the main door.

7. The C-47 has how many gas tanks and holds a total of how many usable gallons?
   a. 4 tanks — 708 gal.
   b. 6 tanks — 808 gal.
   c. 4 tanks — 802 gal.
   4. 6 tanks — 1000 gal.

8. The control handle for inflating the wing de-icer boots is located:
   a. immediately behind the copilot's seat.
   b. just to the left of the Bendix control box on the switch panel.
   c. immediately behind the pilot's seat.

9. After you are certain you have the wheel chocks in place, you release your brakes and spread your landing gear hydraulic handle and flap handle for what reason?
   a. so you won't trip on your way out.
   b. to release hydraulic pressure in the lines to allow for temperature change.
   c. to relieve the pressure in the pressure accumulator.
   d. to hold pressure in these hydraulic systems.

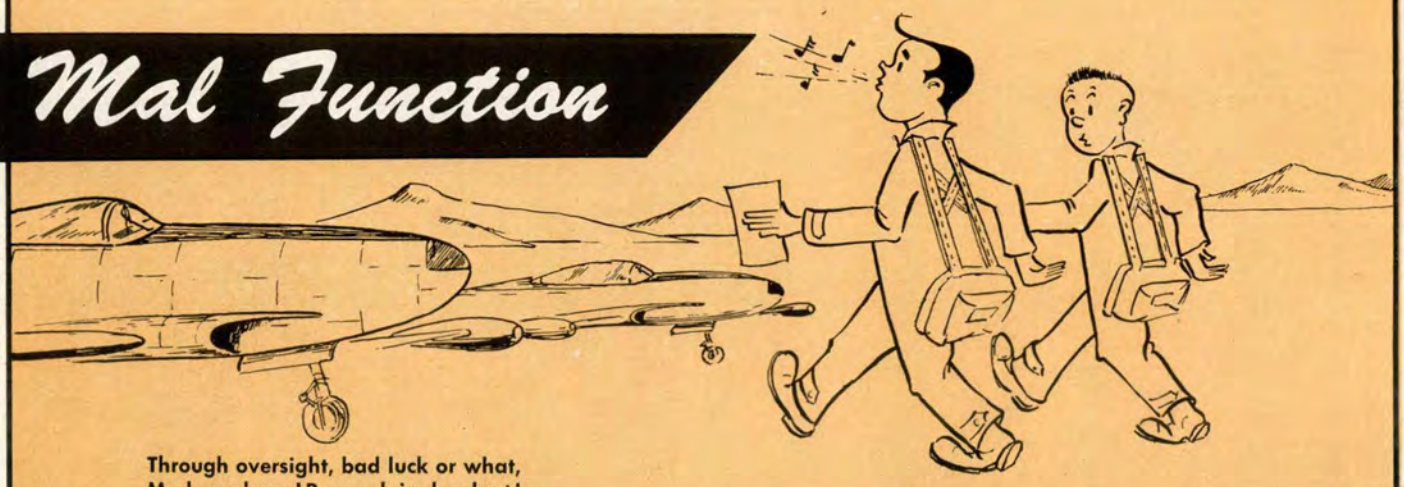
Look before you Leap—

Using the checklist is a bit of foresight which pays off in the most valuable commodity in the world—life. It has saved many pilots' lives, while failure to use checklists has cost many others. These handy little lists, which are found in all Air Force planes, just can't be ignored.

Before she hops into the water, the lovely lady on this page might do well to use a checklist, too. She might find that she isn't properly dressed for swimming—or that there are rocks just under the surface of the water. Right now, at least, she makes a very pretty sight.

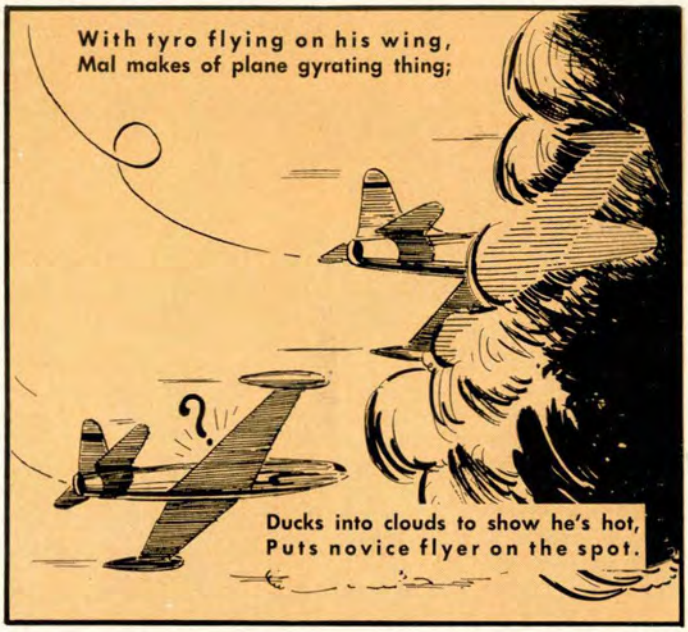
Joyce Mac Kenzie, 20th Century-Fox

Mal Function



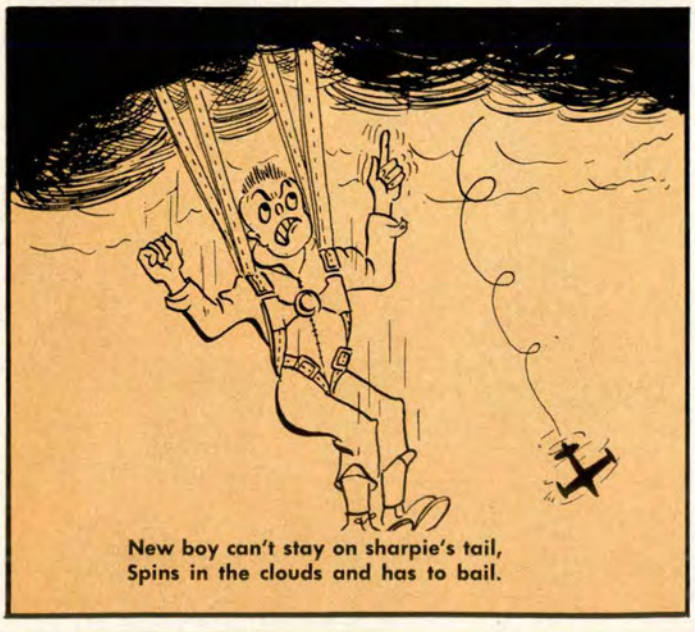
Through oversight, bad luck or what,
Mal makes IP, and is he hot!

The fledgling pilot adulates,
Not knowing what in store awaits.

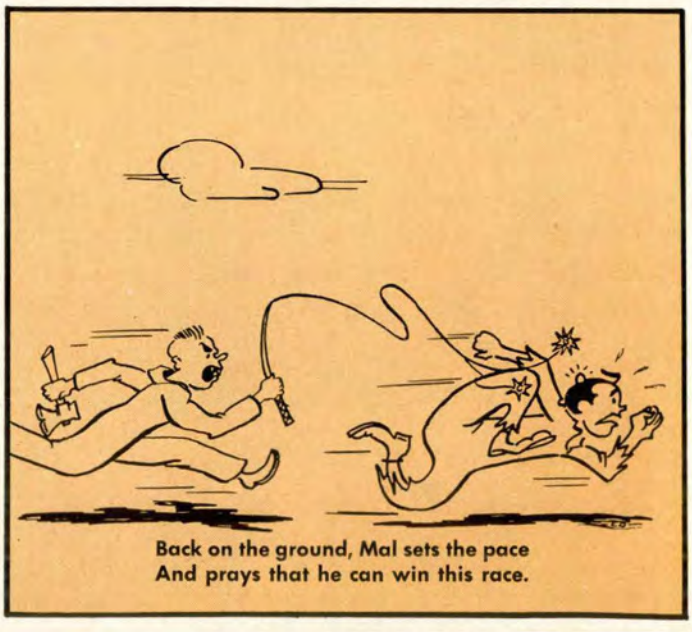


With tyro flying on his wing,
Mal makes of plane gyrating thing;

Ducks into clouds to show he's hot,
Puts novice flyer on the spot.



New boy can't stay on sharpie's tail,
Spins in the clouds and has to bail.



Back on the ground, Mal sets the pace
And prays that he can win this race.

☆ U. S. GOVERNMENT PRINTING OFFICE 1952—952775