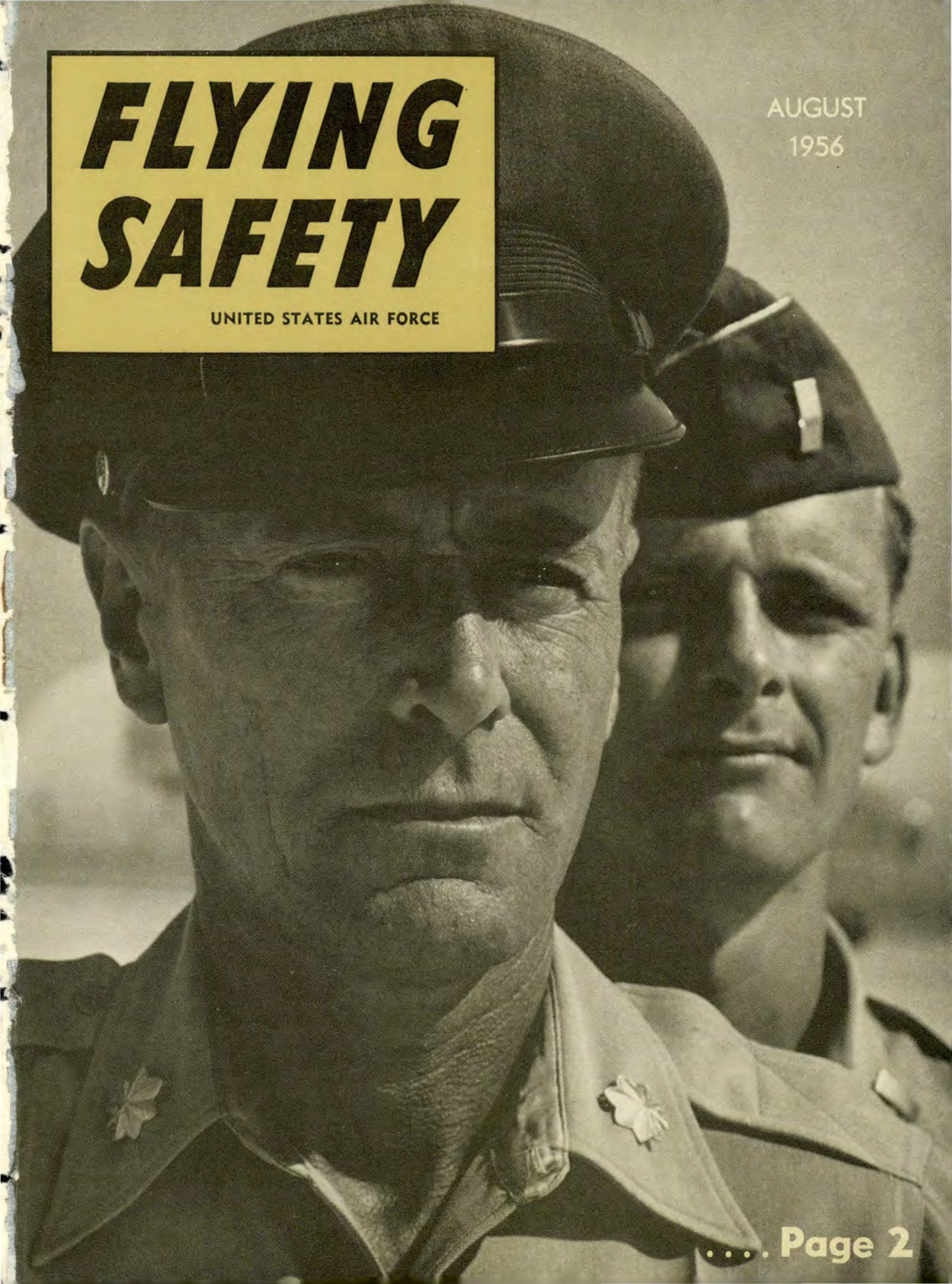
FLYING SAFETY

UNITED STATES AIR FORCE

AUGUST
1956



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FLYING SAFETY

VOL. TWELVE NO. EIGHT

File Thirteen

This is the first "File 13" column and you may well ask the question, "What's your point?"

In a word or three, our object is to bring to you some of the flying safety information which is not adaptable to feature articles. (That's one way of saying, "Herein will appear all of the cats and dogs that hit my desk, get the ten-second stare treatment, then proceed on to File 13.")

True, I fly an LSD (large, steel desk) an awful lot, but this job of mine inherently attracts late info from the boys who know. This, I hope to pass on to you through this column. So-o-o-o, leave us get on with it.

★

. . . There is a change coming up in AFR 60-16 that will require pilots to file IFR when on top of a cloud cover of 6/10 or more. All of the new 60-16 revisions will be reviewed in FLYING SAFETY soon. . . . Just received word of what I believe is the first successful landing barrier engagement with an F-100C equipped with drop tanks. It occurred at Wendover AFB (that's in Utah, sir), and he hit the net doing about 75 knots. . . . Then there's the actual account of the Navy airman who reported that the voice tube he found under the seat was out of order. He couldn't talk to the pilot through it.

So long 'til September. . . .

Perry J. Dahl

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SUBSCRIPTIONS—FLYING SAFETY is available on subscription for $3.00 per year domestic; $4.25 foreign; 25c per copy, through the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Changes in subscription mailings should be sent to the above address. No back copies of the magazines can be furnished.

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USAF PERIODICAL 62-1

LETTERS TO THE EDITOR

Beacon Letters

This refers to the Letters to Editors, FLYING SAFETY, May 1956, titled: "Jolly Well."

A solution for IFR identification of airfields is a 75 mcs marker beacon at each airport with the beacon coded by the letter identifiers of the airfield. This will require no aircraft modification and can be shown in the Radio Facility Chart very easily.

I will expect my free subscription of FLYING SAFETY and will keep you advised of my change of address.

Capt. Ralph S. Hoggatt
605th Tac Control Sq
APO San Francisco, Calif

And there you are!

★ ★ ★

Emergency Landings

The Australian Department of Air has read with interest the February 1956 issue of the USAF Magazine, FLYING SAFETY, and in particular an article under the title of "Down, Boy, Down!" which indicates that the USAF has recommended that in the event of a crash landing on unprepared surfaces the undercarriage should be selected down and locked.

This article states, "As a result of this study, all fighter Flight Handbooks, excluding the one on the F-89, are now being revised." In addition, "Further research projects have been initiated to see whether the same recommendation can be made for forced landings on bombers, transports and trainer aircraft."

This is a radical change in policy and the Australian Department of Air is extremely interested in this departure from long adopted practice and therefore it would be greatly appreciated if this office would be given full details of the studies together with any further information and further recommendations in respect to multi-engine aircraft or single engine aircraft in the bomber, transport and trainer category.

J. R. Lavers
Wing Commander for Air Attache
Royal Australian Air Force

The complete study of Jet Fighter Forced Landings on Unprepared Surfaces is en route. Glad to be of service to our friends from Down Under.

★ ★ ★

Nice Words from the RAF

I have the honour to request your permission to reproduce the article "Bouncing Thru the Boondocks" from the March 1956 issue of your magazine FLYING SAFETY. We would like to use it for our own publication, the *Flying Safety Bulletin*, which is intended as a wall poster for Royal Air Force Transport Command stations and units. If your permission is granted we will include of course a suitable acknowledgment to the source of the article.

Our experience has shown that undershoots form the major part of accidents attributed to that overworked and much maligned factor "pilot error." We are endeavouring to reduce these unfortunate mishaps by all the means at our disposal, and on reading this article we found it to be ideal material for our needs.

May I compliment you on producing a most excellent magazine which is read here with great interest. We obviously have many troubles in common in our respective campaigns against broken aeroplanes and your ideas and advice are a great help.

Sq Ldr K. B. McGlashan
Hq Transport Command
Royal Air Force

It's a privilege to grant you permission to reprint the article, and thanks for the kind words about our magazine. Nice to know that we're of some help to you in your broken airplane department.

★ ★ ★

To Further Flying Safety

The speed control described in the April issue of *Flying Safety Magazine* seems to be a great advancement in instrumentation. However, I believe the words "Increase Speed" and "Decrease Speed" applied to the dial in place of the current "Slow" and "Fast" would be an important, additional safety factor.

Some of our pilots pass a half a dozen school zone signs each day, going to and from the base. A sign reading "Slow, School Zone" develops in the pilot a conditioned reflex to reduce speed a half a dozen times a day at the sight of the word "Slow."

Therefore, I believe, especially where pilot fatigue is concerned, the words "Increase Speed" and "Decrease Speed" might put us a little farther along the road of flying safety.

M/Sgt Carl V. Shrader
3320th Fld Maint Sq
Amarillo AFB, Texas

Thanks. The farther along that road we can get, the better. Your suggestion has been forwarded to the manufacturer of the instrument. Recently, FLYING SAFETY has been receiving more and more letters with flight safety suggestions. Keep 'em coming!

Don't Get

So you are an old hand. So you have lots of time in the bird you're flying. So you have held a green card for years. So familiarity breeds contempt.

WHENEVER DISCUSSION rolls around to the subject of pilot error, the general tendency is to consider this a problem of the young sports, the fledglings. We visualize aviation cadets groundlooping, spinning in, doing all manner of hairy things with airplanes. We take the view, frequently voiced, that if a pilot survives his first year of active duty, he's got it made!

The corrective action we propose usually centers around the training program, instruction, care and feeding of the young birdman. Of course this is all very fine, as long as we don't wear blinders. The new lads commit errors aplenty, it's true, but they have lots of company. The old grizzled veterans can and do botch things up beautifully too, and they,

TOO Familiar!

Lt. Col. Mitchell J. Mulholland
Safety Research and Analysis Div., D/FSR

dear friends, are the people we intend to talk about today.

This is not going to be idle chatter either, because we all consider ourselves experienced pilots and that adds up to a lot of people. The most disastrous accident in point of lives lost in the history of aviation happened to a pilot with 7000 hours. One hundred twenty-eight people met their Maker along with him when their C-124 spun in near Tokyo. It was an experienced Lieutenant Colonel who flew his B-25 into the Empire State Building and another field grade pilot who ran his C-45 into the Bank of the Manhattan Company on Wall Street, between them netting the Air Force some of its most spectacular headlines. We are continually confronted with gross errors committed by people who, we say, should have known better. Sure, maybe they should have, but either they didn't know better (why not?) or something slipped somewhere (what?).

Let's look around us first. This problem is obviously not peculiar to the flying business. How many hours have you logged behind the wheel of an automobile? And yet can you honestly admit you make no errors in that department? Never run out of gas? Never pass a stop sign? Never have a close call? How about the engineer on the Santa Fe's San Diegan? Thirty-seven years of railroading and he took a curve so fast the train fell off the track. These things shouldn't happen, but they do. Who remembers the airliner that crashed on takeoff at Copenhagen a few years back? A senior airline pilot with oodles of hours took off with the control locks on. The oldest booby trap in the books and it caught a wise old bird.

There's an old saying that familiarity breeds contempt. If you've lived with danger for a long time, you tend to reach a point where you no longer recognize the danger. Danger is danger, whether it's exemplified by a sleeping lion, a dormant volcano or a smoothly purring aircraft. No matter how long you've lived with it, it can kill you just as dead as it could if you'd never seen it before.

The first time you fly a new aircraft you treat it with healthy respect. As you put in more time in the beast, you learn more about what it can do, you feel more at home in it. So far so good. But when you reach a point where the airplane fits you like an old shoe, look out! When you lose respect for an airplane it's just like playing with a loaded gun. The people who have been killed in Gooney birds are every bit as dead as those who got it in F-100s. The bird can clobber you just as effectively whether you have two hours or two thousand hours in it. So don't sell any airplane short. An airplane is a machine that defies gravity, and gravity doesn't care what kind of a bird it is. What goes up must come down, including the crew.

Safe Airplanes

Now wherein do we find ourselves losing respect for our aircraft? The most logical place to look first would be the accidents involving our old trusted "safe" airplanes, the C-47, C-54, B-25 and C-45. These are the planes that everybody knows and flies, the traditional old workhorses that we use for any old cat-and-dog mission. Barring out-and-out materiel failure, these old birds just should not have accidents. What do we find? Simply some of the goriest crashes on record. A C-47 splattered against the face of an Arizona mountain. Ditto for a C-54 on Mount Charleston, Nevada. Another in Formosa. In fact there's hardly a self-respecting Alp that doesn't have a Gooney bird draped over it somewhere. It's admittedly hard to clobber these old stalwarts but in an argument with a mountain, any airplane comes off second best. So it's rather amazing how many old hands still try to knock holes through mountains with Gooney birds.

Sometimes it seems as though pilots analyze a "safe" airplane to find out just how it *can* be cracked up, and then proceed to do it. The C-45 will do a pretty little arabesque off the side of the runway if you encourage it. So people do, and look very silly doing it. If you try hard enough you can nose up a C-47 by running up both engines to full power in a tailwind. So people do it. Even a B-25 doesn't do too well on one engine if you slow it down below 145 miles per

If you encourage it, the "safe" C-45 will do a very pretty arabesque off the runway.

hour. But people do it. It seems about the only way to wreck a C-54 is to hit a mountain with it, so failing everything else, people do that. WHY?

Do we look for the answer in sheer carelessness? As a pilot gets older, bewifed and childrenized, he should be more mellowed, more cautious. Do we look for it in declining proficiency? Hardly, in view of the background of experience in most of these pilots. Physical fitness? Senile decay? Look, we're talking about people in their 30s for the most part. No, it's something much more basic. Familiarity breeds contempt, we say. Let's see how it operates.

We have all heard the time-honored cliches, the "famous last words" of the flying business, such as

"Oh heck, it'll burn off by ten o'clock."

Oh heck, we can get through with this airplane."

"Oh heck, B-25s always smell that way."

"Oh heck, it's probably just the gage."

"Oh heck, it's my home base—we can get in."

OR

"Never mind, GCA, we're VFR."

What do all of these gay remarks have in common? Mainly the fact that they all have the ring of experience about them. They come, not from the mouths of babes but from the lips of the old bold boys who nonchalantly light a Murad as they bore holes through the murk.

It's the old hand who watches his fuel gages bounce on the bottom, coolly examines his fingernails and says, "The gages are way off in this airplane—we've got a good two hours gas left." It's the old hand who jaunts off across the high Sierras with no more preparation than he would make for a trip to the drugstore. Maps? Too clumsy. There's a Fac Chart in the airplane. Is there? He doesn't look for one until he's levelled off on top of the overcast, settled the mixtures in cruising lean and asked, "Chief, how's the coffee?"

Flight planning? Sure, he believes in it, but he's not going on a flight. He's just driving a Gooney bird to Great Falls.

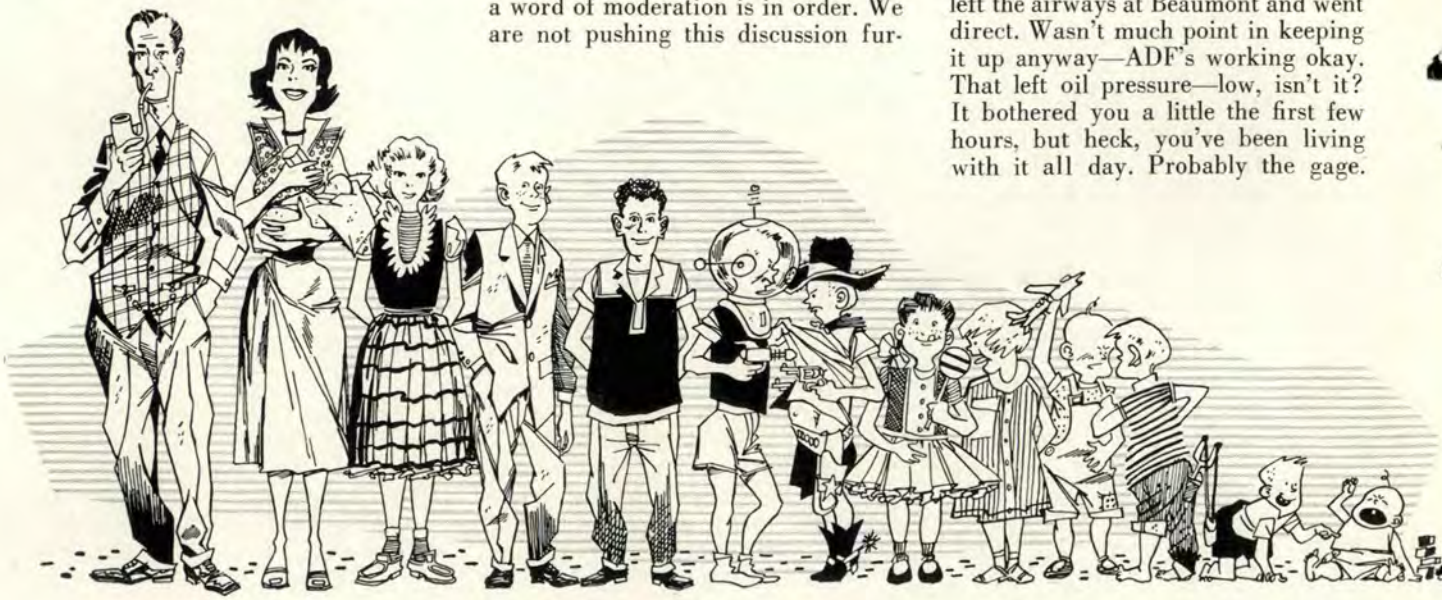
Old Dependable

Before anybody pipes up and says, "That's not *me* you're talking about!", a word of moderation is in order. We are not pushing this discussion further than the realm of our everyday pilots. We are not going to dwell on the follies of the hare-brained extrovert who shows off his familiarity by flying through hangars upside down saying, "Look! no hands!" Leave him to heaven. We are talking about the old commonplace pilot, the type with a wife and a short stack of kids, the old dependable eight to five gent who flies for the long green. It's not a glamorous business any more to this pilot. He probably couldn't care less if he never saw Daggett, Needles, Prescott, Winslow or Zuni again, but he'd rather see them from the air at 200 mph than on the ground at 60. He is long past the stage of slipping the surly bonds of earth, and dancing the sky on laughter-silver'd wings. (Would look kind of silly in a Gooney bird, anyway.) The meat of the matter is that he has reached a danger point and doesn't know it. The danger is boredom.

A Hazard

Yes, I said boredom. If you don't think it's a hazard, just try this sometime for size: Take an old familiar airplane, an "old shoe," take off about 9 in the morning from somewhere in the East, and fly west all day long in CAVU weather, with maybe a little haze. I'll be back around 1630 and ask you what you think about boredom. Just take that map down off the windshield—the one you're using for a sunshade, empty that overloaded ashtray, take that headset off and rub the pain off your earlobes, and tell me all about it. Look at the nice flight log you were keeping until you left the airways at Beaumont and went direct. Wasn't much point in keeping it up anyway—ADF's working okay. That left oil pressure—low, isn't it? It bothered you a little the first few hours, but heck, you've been living with it all day. Probably the gage.

We're talking about the eight to five gent, the one with a wife and short stack of kids.



A bored pilot is hardly in the best shape to meet an emergency. It's an occupational hazard.

That's what the engineer said too. Of course the idea of digging into that engine at your last gas stop didn't appeal to him either. Looked like a heck of a place to be stuck with an AOCP. Especially when you're figuring on an RON in El Paso. What's that station you passed? Wink. Appropriate isn't it? 1630 on a hot, sunny afternoon. Winken, Blinken & Nod. Get some music on the radio compass. No coffee left in the jug. Mouth tastes like an old ashtray. Gad, there's an awful lot of Texas.

Now—what were we saying about boredom? Granted that the type of situation described probably has not directly caused many accidents, but it's a symptom. A bored crew is hardly in the best shape to meet an emergency. The bored pilot tends more and more to take little things for granted, to overlook little discrepancies, to discount danger signs. When the payoff comes he's not ready; he's caught by surprise. It's the bored crew that cuts corners, skimps on preflight inspections, takes short cuts to get the show on the road. Why? Not because they are intentionally negligent. It's just that they've gone through this whole thing so many times that it's an old routine. Everything has been okay in the past; all the extra precautions and checks seem a little silly and unnecessary. And this attitude grows and grows, particularly with a safe old airplane. The old bird grinds along uncomplainingly for so long that we can't picture anything going wrong. The airplane's reputation becomes legendary and people start sticking their necks out for trouble. Years ago it used to be said about the B-18 that it took talent to crack one up and positive genius to hurt yourself in one. But people did both. And they weren't geniuses either. They just forgot that even a B-18 had to be *flown*.

Here we have rambled on about the old Model T's and Mack trucks. What about the jets? Experienced pilots are flying them too. Well, they're doing exactly the same things and for the same reasons. The situation may not appear as extreme, mainly because the jet is newer, faster and doesn't take so infernally long to get somewhere. On the other hand though, it is not nearly so forgiving of mistakes or inattention. It does not like to be taken lightly. So when a pilot reaches the point where he knows the F-86 like the back of his hand, there's all the more reason for him to take care when he flies it. The human mechanisms of adjustment and familiarity work exactly the same in any airplane, and all airplanes are essentially the same kind of beast. It's just that things happen a lot faster in the jet, so the pilot has to plan a lot farther ahead of it.

Don't lose sight of the tremendous adaptability of the human being. He can get used to almost anything. Remember Clyde Beatty in the lion cage? Bullfighters, prizefighters, firefighters, or old GI Joe in the front line foxhole, all exemplify the capacity to adjust to extremely hazardous situations.

Flying an airplane, *any* airplane, is not as alarming an occupation as some of these other pursuits. An airplane doesn't growl and make ugly faces at you all the time. In fact, most of the time it's cooperative and pleasant. But when things go bad, the outlook gets bleak in a hurry. So just because you've gotten used to the job, just because you're experienced and it's all an old story, don't let yourself think that the danger isn't there any more. It's there all right—you're just used to living with it.

The Moral

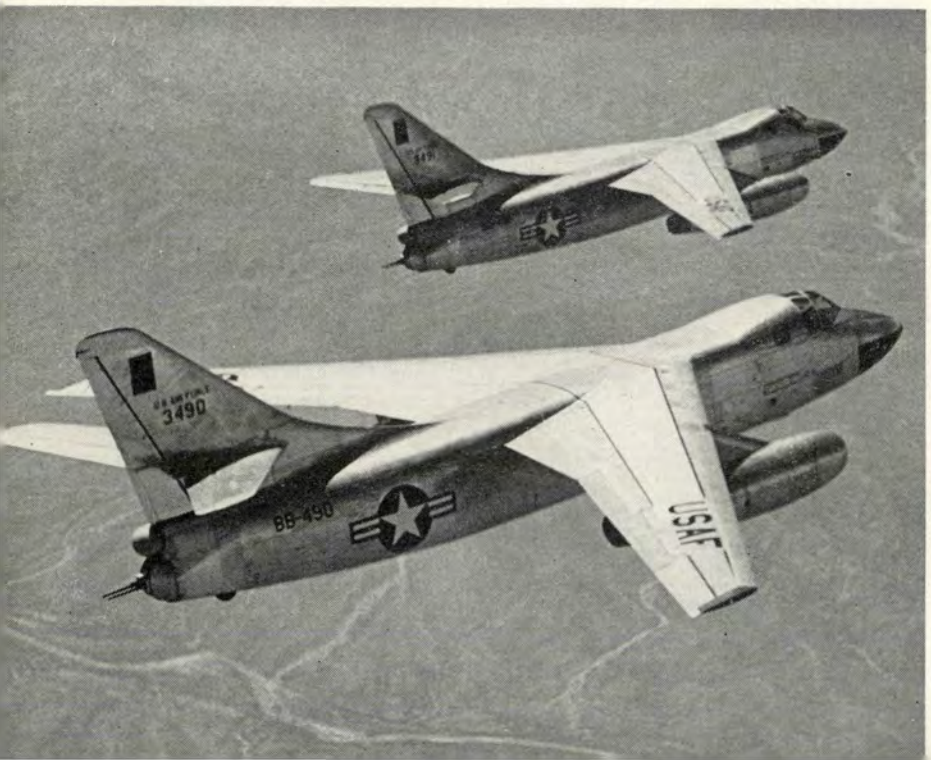
What's the moral of the tale? The pilot doesn't live who is so old or so bold that he can afford to lose respect for his equipment. Take that any way you want—he doesn't live. There's an obvious corollary in this for commanders. The old hands can't be left free of supervision just by virtue of their flying time. Their knowledge and technique have grown with experience, but there are still a lot of imponderables that affect the flying business. Their morale, alertness, prudence, discipline and plain horsesense are factors that the commander must be aware of. They are grown up men, it's true, but the C.O. is still responsible for the way they do their individual job.

Once again consider the airline pilot—he sees the same route a hundred times for every one time the average Air Force jockey sees it. If he lets boredom get him he'll be washed up in a hurry. Discipline and professionalism are the watchwords—it's up to all of us to see that we uphold them in all of our operations. ●

B-66 *from the ground up*

Frank O. Boyer
Douglas Aircraft Company

Here is an article on the latest edition to Uncle Sam's air arm, the versatile B-66. This story was prepared especially for FLYING SAFETY by a veteran Douglas test pilot.



WITH PRODUCTION rolling, many more B-66s will be appearing on the flight line. Since some of you may soon be strapping one securely in place, it might be timely to talk about some of its flying characteristics.

The B-66, like all new complex weapons systems, has had its share of growing pains. A lot of experimental flying had to be done to develop satisfactory characteristics. Initial developmental effort resulted in an excellent hydraulically boosted control system, but buffet became evident and had to be eliminated. Extensive flutter investigation was necessary to insure safe and satisfactory low altitude, high speed performance. Complex electronic accessory equipment gave even the geniuses a few headaches for a while.

The B-66, like all new complex weapons systems, had a lot of experimental flying before it was operational. It is now a bird you will like to fly.

Fortunately, these problems have been corrected to everybody's satisfaction and the B-66 is now a weapons system ready for operation. However, we will be concerned here with general characteristics and operating procedures, since mission profiles and performance data still are classified.

The J-71-11 engines are working out very well. Flight tests have demonstrated that when properly adjusted, they are meeting thrust guarantees and acceleration characteristics are greatly improved. However, idle thrust might be considered a little high, resulting in high unbraked taxi ground speeds.

In normal operation, the rudder-elevator boost system is supplied by a hydraulic pump mounted on the right engine. The aileron boost and spoiler systems are supplied by a pump on the left engine. In the event of engine failure, the systems are automatically interconnected as the failed engine RPM drops below 41 per cent, thus precluding the possibility of loss of control system boost during single engine operation. The utility and emergency hydraulic systems are similarly interconnected.

The fuel supply is furnished from two fuselage and two wingtanks. Prescheduled fuel levels are automatically maintained in the fore and aft fuselage tanks to eliminate center of gravity (CG) shift. Proper levels also are maintained automatically during wingtank fuel transfer. In the event of failure of the automatic CG control, manual override is provided and fuel schedules should be monitored.

As in all aircraft, safe flight begins with good planning. Particular attention should be given to takeoff conditions. We cannot over-emphasize the importance of knowing minimum runway lengths, maximum refusal speeds, minimum single engine control speeds and best single engine climb speed for various flight conditions that may be encountered in tactical operations. The habit of giving the airplane the once over prior to leaping into the blue is as ageless and necessary as flying speed is to flight. All in all, these items add up to peace of mind and confidence.

Entrance to the aircraft is gained through a hatch on the underside of the aircraft. A ladder is an integral part of the hatch door and no special stands are required. The navigator and gunner have easy access to their stations. The passageway to the pilot's position is narrow and there is a fairly tight squeeze into the cockpit. Once seated, the controls, switches and knobs are readily accessible and logically located.

Handling Characteristics

Ground handling is very good. Nosewheel steering is accomplished by a two-ratio hydraulic system actuated by rudder pedal deflection. Directional control is positive and pedal forces are light. Wheel brakes are effective but heat dissipation is marginal. As is the case with most high performance aircraft, prolonged, excessive use of the brakes can result in an overheat condition.

The flight characteristics of this aircraft make it unusually easy to fly

The aircraft is built fairly close to the ground and entrance can be made through a hatch on the under-side of the fuselage. Below, the starting unit is hooked to a single point receptacle.

and no special techniques are required. During takeoff, directional control is maintained by using rudder pedal steering. Because of the narrow landing gear, the aircraft has a tendency to bicycle (turn toward the direction of wing roll) during high speed ground operation. As a consequence, a wings-level condition must be maintained during the takeoff ground run by use of ailerons.

In a crosswind, the upwind wing tends to rise, resulting in a tendency for the aircraft to turn downwind. Though nosewheel steering is sufficiently powerful to maintain directional control, the aircraft leans downwind until sufficient speed is gained for the ailerons to take effect.

The aircraft may be rotated to a takeoff attitude approximately 15 knots below lift-off speed and then allowed to become airborne as takeoff speed is attained. Some pilots prefer to leave the nosewheel on the ground until flight speed is attained and then lift the aircraft off. This technique has the advantage of better directional control through rudder pedal steering in the event of an engine failure while the aircraft is still on the ground. Also, it minimizes drag until flight speed is attained. Under aft CG conditions, the airplane has a tendency to pitch up slightly as it becomes airborne if the nose is lifted too early or if too much nose-up trim is used.

Airborne

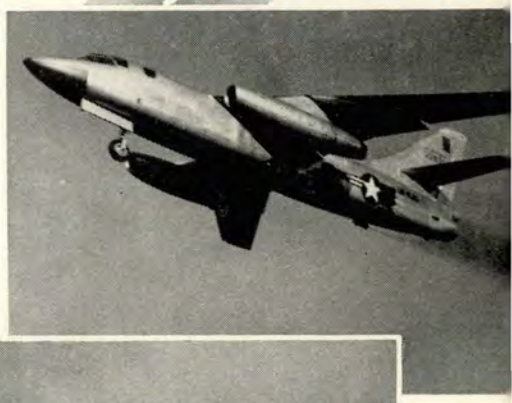
Once flight is attained, the gear may be retracted immediately without experiencing a trim change. During flap retraction and under normal operational gross weights, the aircraft accelerates sufficiently well to prevent any sinking. During climb the aircraft attitude is relatively nose-low,

allowing good forward visibility. To achieve maximum performance, the climb schedule should be strictly observed. Above 30,000 feet, a variance of the climb schedule as much as 15 knots, indicated airspeed, can result in considerable loss of rate of climb.

Because of the excellent warning characteristics there is little danger of stalling unintentionally. With gear and flaps up, stall warning is generally 15 to 20 knots above stalling speed, and the buffet becomes so severe at or near the stall that most pilots avoid stalling the aircraft in this configuration. The aircraft responds well to all controls throughout approach to stall. As the aircraft stalls, the nose drops slightly with no tendency to roll. Stall recovery may be accomplished merely by releasing back pressure on the control column. With the gear and flaps extended, the aircraft has about the same stall warning. Buffet intensity is much lower than in the clean configuration and warning occurs approximately 10 knots above the stall. Again as the aircraft stalls the nose drops through slightly without wing roll off. If the pilot inadvertently enters the stall in a yaw condition, the aircraft will have a tendency to roll off in this direction. However, sufficient aileron and rudder control exists to correct this condition and again stall recovery may be accomplished by releasing back pressure on the control column. It might be noted that in this configuration if the stall condition is continued, a longitudinal oscillation can occur, and if continued, the amplitude will increase. Therefore, the stall should not be continued through this kind of condition.

Since all performance data are classified, security will not allow mentioning specific Mach numbers but a résumé of the high Mach characteristics is made below, describing them in the same order as they occur.

As Mach number is increased above maximum level flight speed, a slight buffet occurs. As Mach number is fur-



The aircraft may be rotated to takeoff attitude 15 knots below lift-off speed. With Jato it accelerates rapidly with no control problems. Gear retraction causes no apparent change in the trim.

Nosewheel steering is accomplished through rudder pedal deflection.

The B-66 is a stable aircraft with good control responses. It is equipped with in-flight refueling facilities for increased range.

ther increased, the buffet intensity increases and then levels off at a moderate buffet level. As Mach number continues to increase, a slight wing roll-off occurs but lateral control is adequate and wings level flight can be maintained easily. This trim change disappears with a further increase in Mach number. Shortly thereafter, the aircraft experiences a very slight tuck or pitch-down trim change. This characteristic is so slight that it is seldom detected by the pilot. No other trim changes occur and the buffet disappears completely as the Mach number is increased. Throughout this Mach region, there is adequate aircraft response to all controls. Elevator effectiveness begins to deteriorate very soon after Mach buffet occurs but at the highest Mach numbers flown to date, there is sufficient effectiveness to adequately control the aircraft without difficulty.

The B-66 has the capabilities of satisfying requirements for low altitude high-speed bombing missions. The relatively low control forces as well as the excellent aircraft response at high indicated speeds, result in a very maneuverable aircraft considering the size and weight involved. Because of the light control forces, there may be some concern that structural limits of the aircraft may be exceeded. To assist the pilot in observing the structural limits, a boost cut-off device has been installed in the control systems to prevent excessive control deflections. There are areas of flight wherein these devices do not necessarily protect the aircraft structure and as a consequence, the pilot should be thoroughly familiar with these limits. Although an increase in speed causes the control forces to increase, a pilot should experience no difficulty in performing various maneuvers under these high speed conditions. Rate of roll does decrease at the high indicated airspeeds because of the low deflection limits of the ailerons. Even so, the rates of roll are adequate to perform evasive tactics and maneuvers. Generally, the maneuvering characteristics of the B-66 are no different than most other high speed swept-wing aircraft. As G forces are increased under maneuvering conditions, the aircraft begins to buffet long before stall occurs.

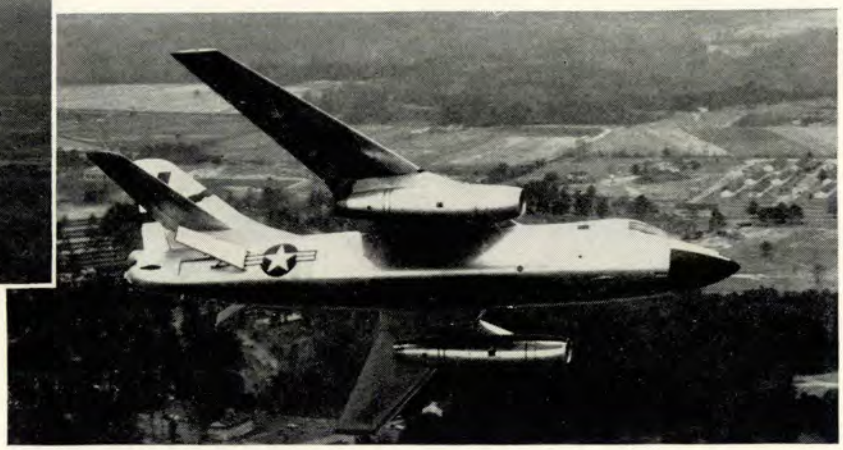
The J-71-11 engines are meeting the thrust guarantees. Low slung, they are readily accessible.

Speed Brakes

Speed brakes are very effective, especially at high speeds. When the speed brakes are extended, a slight pitch-up is experienced, but this is easily controlled. During the final approach to landing, the speed brakes are naturally less effective, but they do assist in slowing the aircraft for touchdown. Occasionally, when the speed brakes are retracted, there is a slight yawing tendency caused by one brake closing before the other. This condition is caused by the actuating cylinders for the two speed brakes being located nearer one brake than the other. The condition, though hardly desirable, presents no problem and is easily controlled.

Consistently good landings can be made in this aircraft by use of normal landing techniques. Either the normal 360-degrees overhead or the

The B-66 has the capabilities of satisfying low altitude as well as high altitude requirements. The low control forces means good maneuverability.



Consistently good landings can be made by use of normal landing techniques. Drag chute reduces the landing roll.

normal horizontal traffic pattern may be used. For the initial entry, a reasonable speed is 250 knots. At the point of break, extend the speed brakes and set the power to approximately 85 per cent. The gear and flaps may be extended as soon as the aircraft decelerates to the limit speeds. If a downwind and base leg are used, the speed brakes should be retracted until on the final approach. If, however, the pattern is relatively close in, the speed brakes may be left out. If the yaw damper is off during the landing, a lateral directional oscillation may occur especially under turbulent air conditions. Although the condition is somewhat disconcerting, pilots should have no control difficulties. The transition from approach to touchdown is normal. Stall warning buffet occurs long before the stall and the aircraft has sufficient control in stall warning buffet to accomplish a smooth ground contact. After touchdown the nose gear should be lowered for directional control through the rudder pedal steering. This is especially true during high performance landings when the drag chute is to be actuated and deployed.

Cross Winds

The airplane has been landed successfully in a 30-knot, 90-degrees crosswind. The wing-down technique is recommended to kill drift. If crosswind conditions are sufficiently adverse, the airplane may be landed on one main wheel with the upwind wing low. After touchdown, because of the narrow gear, the airplane has a natural tendency to lean downwind. This may be counteracted by the use of aileron into the wind during the landing roll. As with other aircraft, caution should be exercised when the drag chute is used under crosswind conditions due to the weather-cocking moment. Excellent short landing performance may be achieved by use of maximum braking with anti-skid and early drag chute deployment after touchdown.

Since the B-66 is a complex weapons system, efforts have been made to relieve the necessity of constant pilot attention, wherever possible. With all systems operating normally, the pilot has only to monitor the systems and can direct his attention toward mission accomplishment. Although the B-66 is a "big hunk of responsibility" for one pilot, the straight forward flying characteristics and automatic features make it a *pilot's* airplane as well as a potent addition to Uncle's growing air arm. ●

AK-YAK-YAK-YAK-YAK-YAK-YAK-

It is the finer points that separate the professional from the "Form 14 looking for a place to happen" type of pilot. Next time out, why not do it the right way.

DO YOU FLY a mahogany bomber most of the time? Are you a CRT pilot? If so, the odds are that you will probably read about yourself in this article. If you are a line pilot, the odds are that you can pick up some pointers.

When taxiing out, do you use the phrase, "Request takeoff instructions?" It is much better to say, "Blank Tower, Air Force 12345, taxi clearance, instruments (or VFR) to (Destination)." This clues the tower operator in on who you are and where you are going.

To avoid clearance mixups and repeats, copy the clearance as it is received, using an approved code system. (Check page 156, Supplementary Flight Information Document for symbols of abbreviation.) It helps also to refer to the duplicate copy of the Form 175 while acknowledging your route. And instead of berating the tower operator for relaying a cruise altitude of 14,000 feet, simply advise that you cannot accept any altitude above (whatever you specify) and request an amended clearance.

With today's overburdened Air Traffic Control system, every possible effort should be made to minimize air communications. Logically, then, reducing the excessive amount of chatter would benefit every user. Here are some examples:

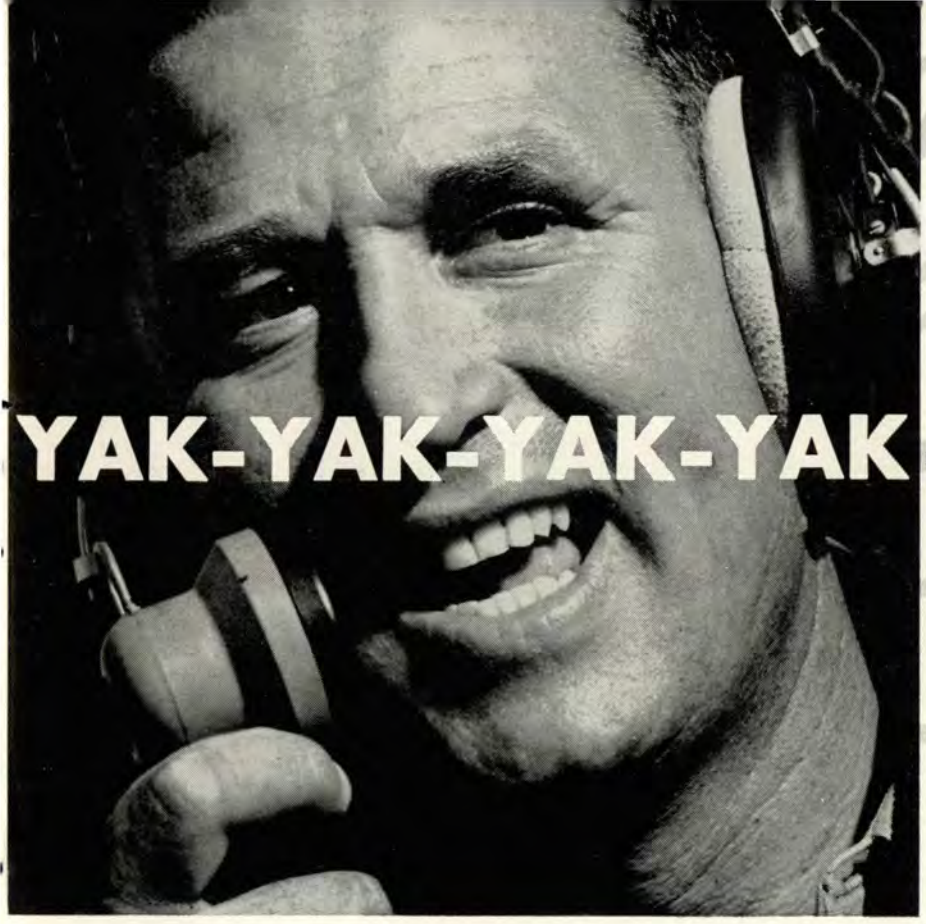
It is not necessary to call the tower for permission to leave tower frequency or to advise that you are doing so. Nor is there any particular hurry in leaving this frequency until you have established your climb and are on course, unless clearance instructions specify an immediate call to a control agency on another frequency. If an emergency develops shortly after takeoff, you are in a better position to return to the field safely if you have not left the control tower frequency.

Another common source of lengthy yakking is the acknowledgment of information or instructions from approach control. Repeat only enough to satisfy the controller that you completely understand. It is not necessary to repeat back the entire clearance in total. For instance, if you are holding at 3500 feet, and receive instructions to "descend to 2500," just say, "Roger, leaving 3500 for 2500."

And still another opportunity to reduce transmission time is on an altitude change request. Instead of saying, "Request that I be granted permission to descend to 6000 feet," why not use the approved "Request 6000. Can descend VFR." Many times the control agency can approve a lower altitude if you can get through an intermediate altitude by flying VFR.

An almost universal habit of using ADF to fly airways exclusively, seems to characterize so many CRT pilots. Unfortunately, many who fly from station to station on the ARN-6 have not learned the techniques or importance of ADF tracking. Consequently, some attempts at homing, while contending with strong crosswinds, may result in erratic flight paths over the ground. Conceivably a pilot can end up on the left side of a low frequency airway, not realizing that ATC may occasionally allow traffic from the opposite direction to pass through his altitude, by climbing or descending "well to the right of the on-course."

Relying on the ARN-6 aural signal while flying the "automatic" position is poor technique. The aural signal is not entirely reliable on "automatic," because the weaker signal is repelled. The frequency for best range reception or readability is slightly different than for best ADF reception. This is



because the center transmitter tower, which is the one that you tune in for simultaneous broadcast and ADF reception, transmits on the station's assigned frequency. (This is shown in the Radio Facility Chart.) The four towers which transmit the A and N signals actually transmit 1.02 kc higher than the assigned frequency. So, if you insist on using ADF, guard the aural signal on another receiver.

A normal position report should offer no difficulty to any pilot. The accepted procedure is to make the initial call and, when acknowledged by the ground agency, follow the prescribed position report form in the Radio Facility Chart. "Shreveport two four, nine thousand, instrument flight plan, Monroe four nine, Jackson." No more—no less. It is desirable to guard also the range frequency when establishing contact. Then if your receiver is inoperative or the station called has VHF/UHF transmitter difficulties, the operator will transmit on LF, assuming that you are guarding this frequency.

It is often unnecessary to request the "latest weather" at some nearby destination. A complete, weather coverage is broadcast at 15 and 45 minutes *after* the hour by almost every range station in the United States. The 45 minutes-after-the-hour weather is brand new. It is an "area" broadcast consisting of weather reports from stations within approximately 150 miles of the broadcasting station. The 15 minutes weather is just over one half hour old. It is an "airway" broadcast consisting of weather reports from important terminals located on airways within approximately 400 miles of the broadcasting station. If you have received a report, remember that the next observation normally will not be taken until half past the hour and will show up on the 45 minutes broadcast. Listening to these scheduled broadcasts would eliminate many weather requests.

The approach and landing phase should begin at least an hour out if you are VFR. After establishing an ETA at destination, a gradual power-on descent may be used. When an unrestricted descent is possible, 200 feet per minute for conventional aircraft, seems quite satisfactory. Thus, at five minutes per thousand feet, determination of the time to commence descent is made easy.

The sharp pilot is thinking about his landing long before reaching his destination. Having listened to the scheduled weather broadcasts, including the destination weather reports, he already knows the wind direction and velocity. Using careful descent planning, he arrives at his destination at pattern altitude.

By referring to the approach and landing charts, he can determine landmarks, hazards and other essential information. Also, the approach chart shows the runways and landing area in detail. When possible, the tower frequency should be guarded as soon as you are within reception range. This way, you should be aware of the landing runway well before arriving. Your planning, with the help of the approach chart, will allow you to enter the proper pattern, line up on final, avoid unlighted obstructions and land safely. At night, especially, if you will keep the runway heading in mind, in relation to the base leg or downwind headings, you should never land on a wide taxiway.

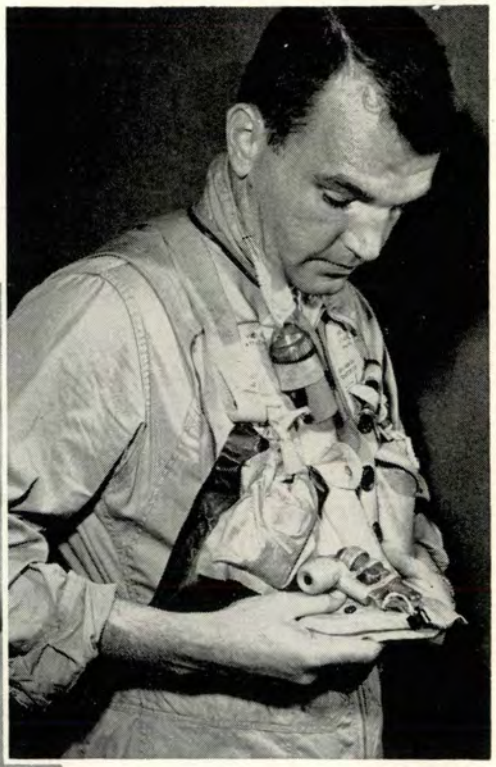
These are only a few tips on flight planning and voice procedures. Why not use them? ●

Keep Current

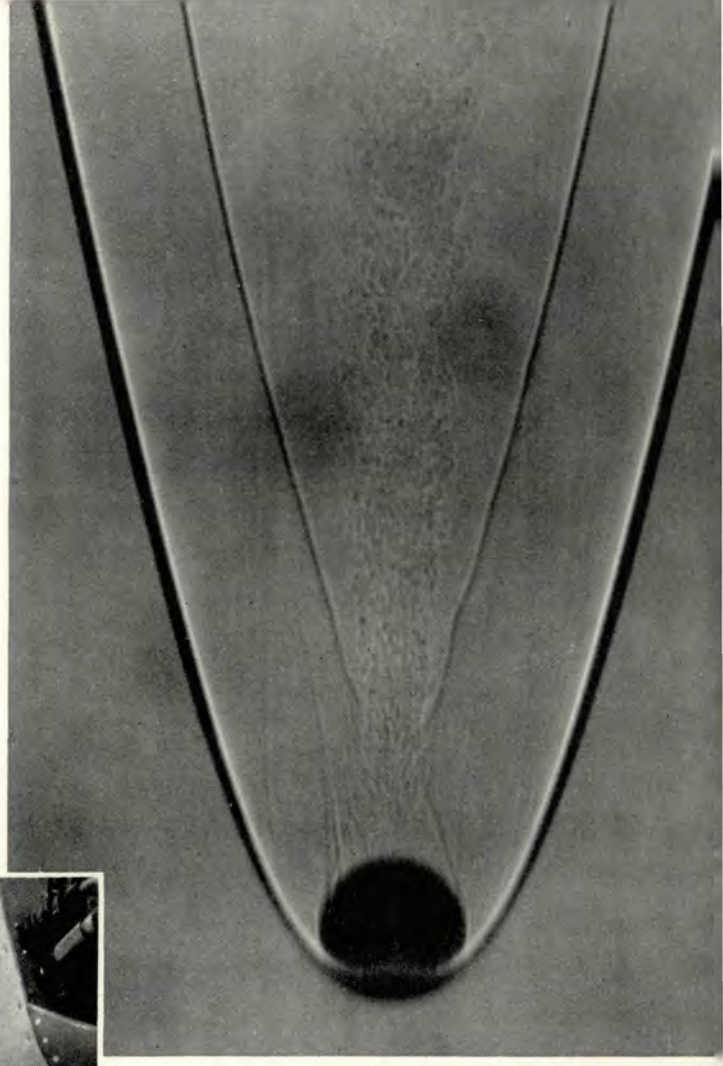
NEWS AND VIEWS

The B-57E is the latest, specially equipped high speed target aircraft. The two long tubes located on the underside of the fuselage release the targets.

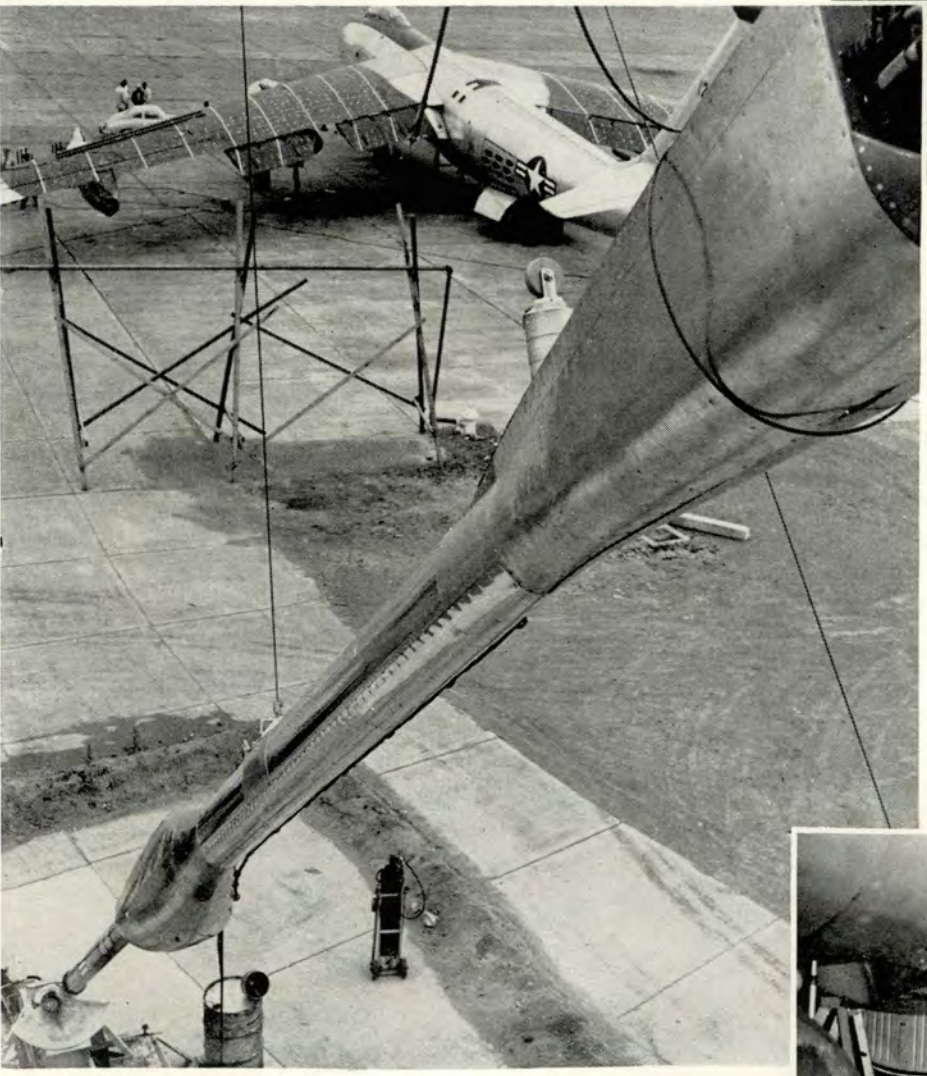
Shown below is the new automatic Mae West inflator. Developed by North American Aviation, it will automatically inflate, 15 seconds after water contact.

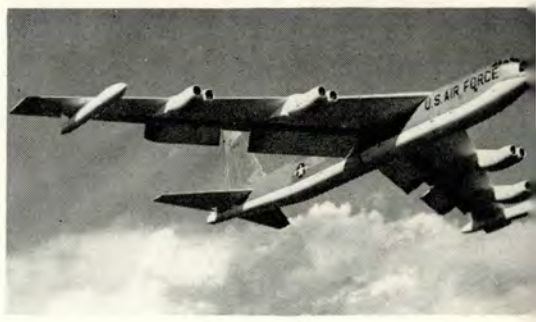


With the coming of the KC-135, Boeing's jet tanker, a new, high-speed refueling boom was needed. Before installation and in-flight tests, the equipment shown here gave engineers data on design deficiencies.



Above, this is what 10,000 mph looks like. The sphere pictured here was shot from a special gun used to get data on temperatures at high speeds.





The B-52 with the larger external fuel tanks also is getting a new, unique bomb bay capsule. Below, the capsule is shown being hoisted into position.

Speak!

As an Air Force pilot, your health is something you can not neglect. When that annual physical rolls around, you can get an adequate evaluation only if you . . .

Colonel Harold V. Ellingson, USAF (MC)
Alaskan Air Command

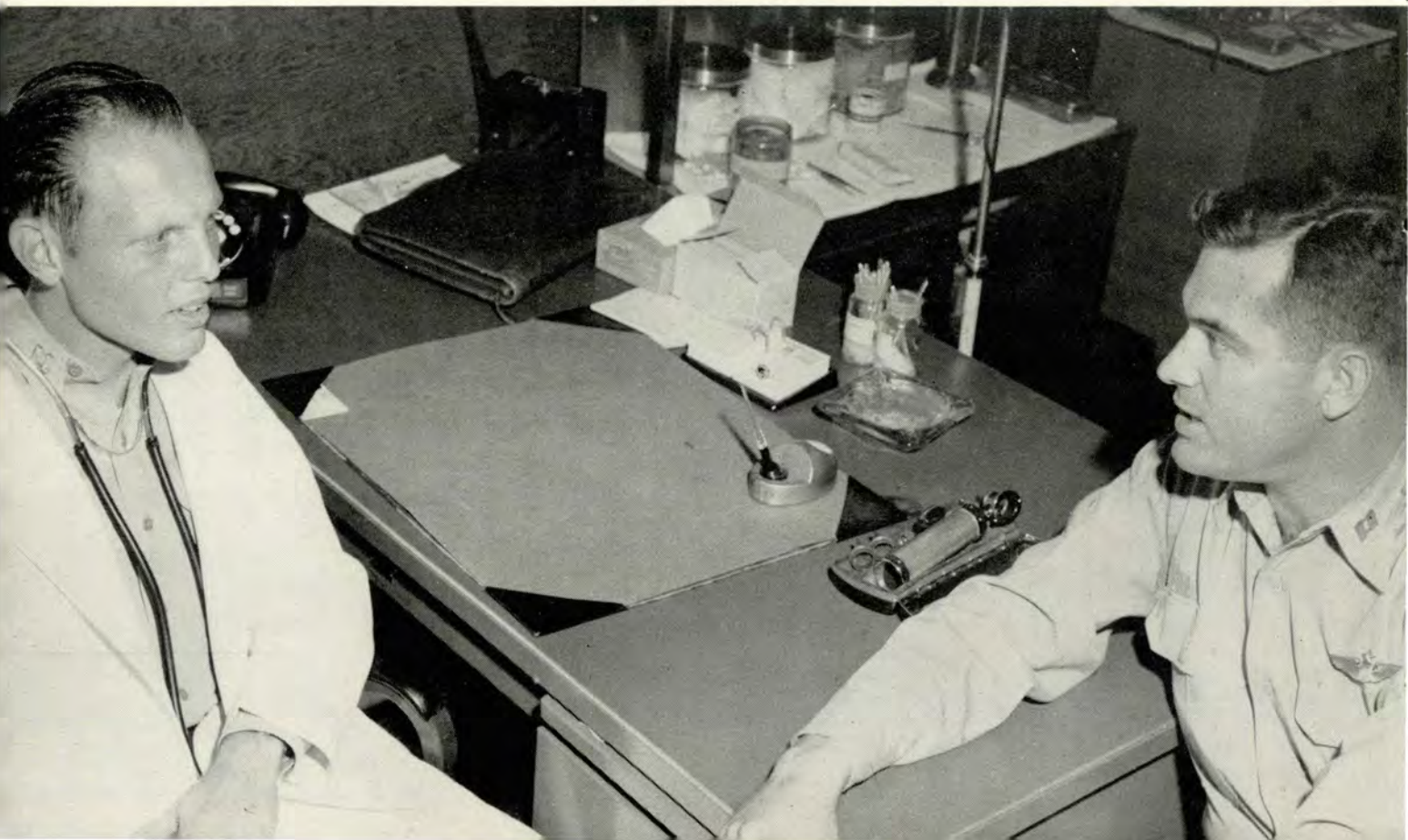
THE ANNUAL physical examination is a very important part of an Air Force program. It's purpose is to maintain peak health. It sometimes falls short of its intended usefulness, however, because of misunderstanding by both medical personnel and examinees. Here is what an annual examination will include, what it can and cannot do, and what you can do to make the examination more profitable.

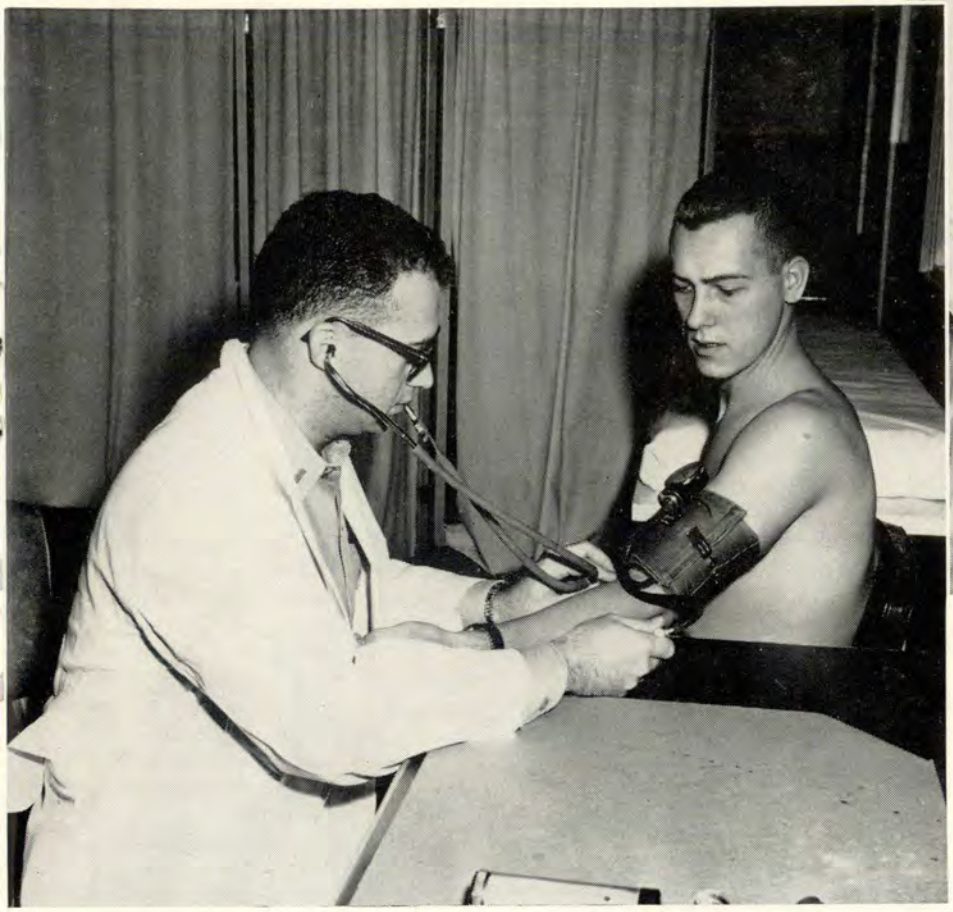
What It Includes

The Air Force Regulation on Annual Medical Evaluations (AFR 160-10) eliminated many unproductive portions of the examination as it used to be given. Listening to the lungs and "thumping" the chest, for instance, almost never yielded information regarding disease, and then only when such diseases were more accurately detected by other means. These and many similar procedures, therefore, were eliminated. Also eliminated were entries regarding height, color vision, color of hair and other characteristics which can be assumed to be essentially unchanged through the years. The effect of these changes was to shorten the examination materially, saving time for both the examinee and the doctor.

The most critical and most informative procedures have been retained, however; furthermore, emphasis is now being placed on the interview with the physician as a means of determining what additional tests or procedures, if any, may be appropriate. The following are the minimum procedures for future annual examinations in this Command for example:

- Dental examination.
- Weight.
- Blood pressure, seated.





High or low blood pressure can be treated so as to prevent some of the important complications.

Even ear ailments can be concealed, so speak.

• Visual acuity, distant, for all personnel; heterophoria for aircrew and air traffic control personnel, and near vision for persons over 40.

• Chest x-ray.

• Urinalysis (sugar and albumin).

• Hemoglobin determination.

• Examination of the rectum and prostate in males over 40 years of age and for others when indicated.

• Electrocardiogram when indicated (required for persons over 40 years of age; that is, beginning with the annual examination immediately preceding the 41st birthday).

• Review by the physician of all findings and medical records of the examinee.

• Interview of the examinee by the physician, with review of symptoms and discussion of personal medical problems. Any additional tests, procedures or consultations suggested by findings or history obtained as above.

It should be realized that the examination procedures, by themselves, will reveal a rather limited number of disorders. Most of these can be enumerated very briefly.

What It Reveals

• Dental decay. As a rule, appointments are made for dental treatments found necessary at the time of the annual examination.

• Gain or loss in weight. Obesity, if found, can be treated for an improvement in general health.

• High or low blood pressure. High blood pressure, if found, can be treated so that some important complications can be prevented.

• Changes in visual acuity. Increasing difficulty in focusing on near objects is normal after age 40; glasses for reading—or bifocals if you've previously used glasses—usually become desirable at some time after age 40.

• Chest x-rays reveal kinds of lung disease, such as tuberculosis and tumors, and enlargement of the heart.

• Urinalysis will reveal some cases of early or mild diabetes, and some kinds of kidney disease.

• Hemoglobin determination will detect anemia, which, in turn, is indicative of either gross dietary deficiency or serious disease which deserves further investigation.

• Rectal examination will reveal many cases of hemorrhoids, as well as enlargement of the prostate (common at ages beyond 60) and some cases of malignancy of the prostate.

• Electrocardiograms are of value mainly in detecting PAST attacks of heart disease.

Detection of other disorders depends very largely on the frankness and honesty of the examinee during the interview. Most disorders can be detected if the physician is alerted by the examinee. Conversely, a large list of diseases can be concealed if the examinee sits mum, thinking, "If the doc can't find it, it can't be very bad" or if the interview is hastily or incorrectly conducted.

What It Does Not Reveal

Without full discussion by the examinee, the annual examination may reveal absolutely *nothing* beyond the items listed above. It is not, except for a few of the disorders listed, of great predictive value ("Guess I'll last for another year").

Even chest x-rays, unless special techniques are ordered on the basis of symptoms reported, may miss some

cases of lung diseases. People have been known to drop dead of a heart attack immediately after a normal electrocardiogram. A rectal examination may miss some cases of internal hemorrhoids unless the examinee describes his symptoms. A tremendous variety of digestive disorders may be missed unless symptoms are described. In brief, the great bulk of diseases are detected only by investigation of symptoms.

What You Can Do

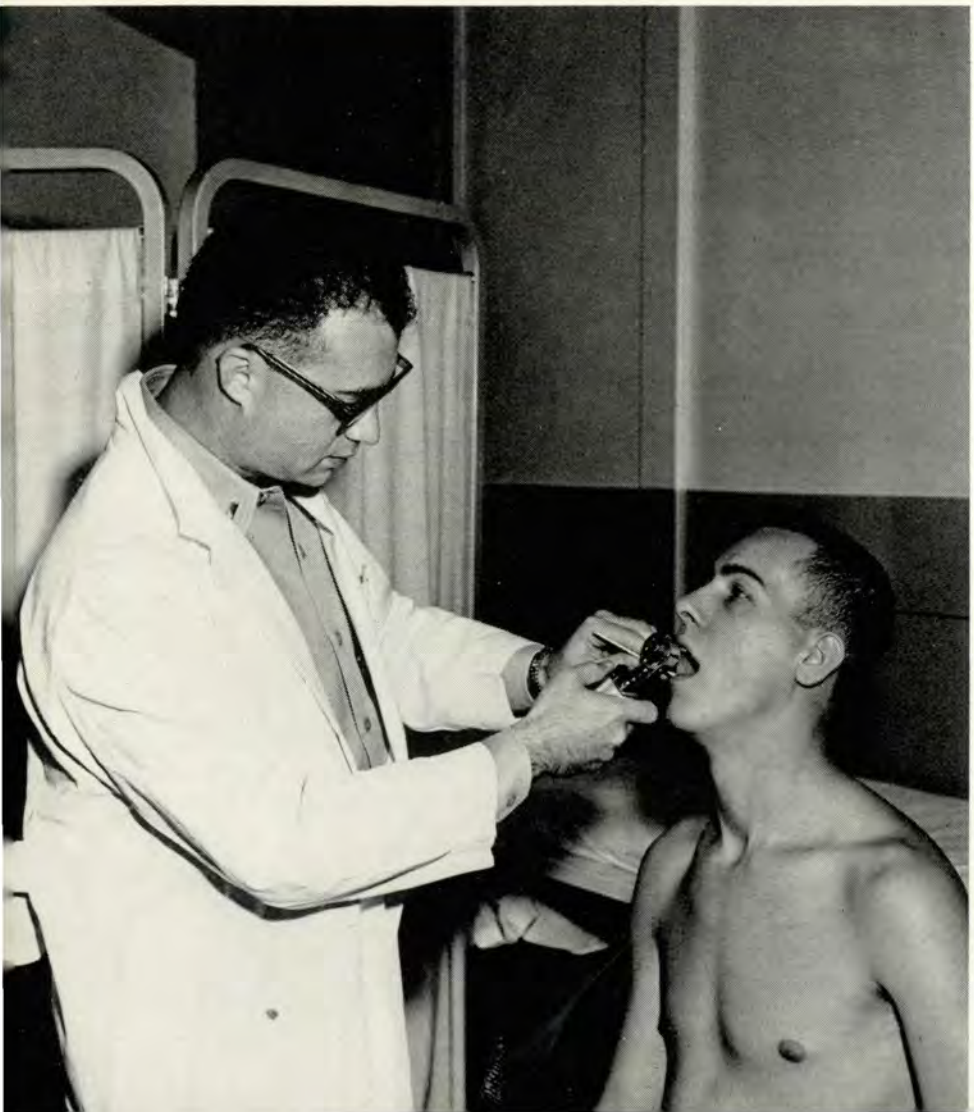
The place where your active cooperation is essential is in the interview. Here you should mention any symptoms which might be indicative of serious disease. Here, too, is your chance to ask advice on your personal medical problems.

In these interviews one hesitates to appear a hypochondriac. It has been said that every "normal" individual has a few scattered areas of pain at all times, particularly in joints and muscles. Most of these are below the level of consciousness most of the time. But if a person picks out a pain, and mentally dwells upon it, he can unconsciously raise it to a level where it bothers him a great deal. Obviously it is not desirable to record, classify and recite every ache and pain experienced.

On the other hand, however, most of the indications of really serious diseases are fairly easily recognized. A catalog of all possible symptoms would fill a book. But some of the most important are listed below. Every one of these, at one time or another, has been overlooked, neglected or concealed because someone thought it was unimportant.

- Any blood discharged from the body in stools, urine or sputum.
- Any dizziness or loss of consciousness.
- Any abrupt or unexplained change in weight. Probably everyone ought to check his weight every few weeks. If you are overweight, now is the time to ask for advice on reducing.
- Any change in bowel habits or abnormality of color or consistency of bowel movements.
- Any change in sleeping habits, as for instance requiring additional pillows.
- Unexplained fatigue or weakness. This does not apply to the desk-bound executive type who goes hunting once a year and finds himself exhausted after walking 50 yards across the tundra. Such a person ought to keep himself in better shape, with regular exercise.
- Any persistent, unexplained headache.
- Persistent cough. Heavy smokers often have a chronic cough, noticeable particularly in the morning. If you're in this category, you smoke too much. A "smoker's cough" sometimes conceals the onset of serious lung disease. If you don't propose to cut down on your smoking, you should at least be alert to any change in the cough, and check your sputum occasionally for blood.
- Pain or difficulty associated with any normal body functions—swallowing, urinating or having a bowel movement.
- Persistent, unexplained "indigestion," or recurrent abdominal pain.
- Chest pain if severe, or if it radiates into either arm.
- Any mass or lump, in any location. Women are currently being coached in the matter of self-examination of the breast. Occasional self-examination of the testes is equally important for men.
- Any sore on the skin or in the mouth which does not heal.
- Any other symptom which has caused you serious concern.

The Doc can find things by examination, however, he can do better by investigating symptoms.



In Summary

The primary responsibility for keeping yourself healthy and for detecting disease in early stages rests with YOU.

You should take the initiative in reporting important symptoms. Any of the symptoms listed above should actually be reported as soon as they are noted. But the "annual physical" will detect *some* of the important diseases. Moreover, it provides an excellent opportunity for you to review your medical status and to secure medical advice on problems of health and hygiene. ●

WELL DONE

Lieutenant

Robert E. Hardin

46th Fl. Sq., Dover AFB, Del.

★

LT. ROBERT E. HARDIN (Radar Observer) and Lt. Frank L. Redditt (Pilot), took off in a T-33 from O'Hare International Airport, Illinois, for Dover Air Force Base, Delaware. They were on the return leg of a navigational cross-country flight.

Cruising at 41,000 feet on a 1000/top IFR clearance, they arrived over the Dover range station after an hour and 45 minutes en route. Weather had lowered below minimums and they were advised to continue to their designated alternate.

Shortly after departing on their new course, the T-33 started a gentle turn to the left. Gradually, the bank increased and the nose dropped. The airspeed increased rapidly. When Lt. Redditt, the pilot, made no attempt to recover from this flying attitude, Lt. Hardin shook the stick vigorously, but there was no response.

Lt. Hardin realized that his pilot was unconscious so he leveled the wings and eased back on the stick. With the airplane under control, the observer started a descent through the clouds and broke out between layers at 30,000 feet. He contacted the nearest Air Force base and declared an emergency. Continuing his descent to 24,000 feet, he saw Lt. Redditt shake his head as he regained consciousness. Fully recovered, Lt. Redditt flew to the alternate and landed.

Examination of the oxygen system the next day revealed a loose connection where the oxygen hose joined the seat quick disconnect.

The quick action displayed by Lt. Hardin and his ability to fly the jet under IFR conditions prevented a possible aircraft accident and loss of life. Well Done!

Runway Check

Major Edward P. McNeff
Fighter Branch, D/FSR

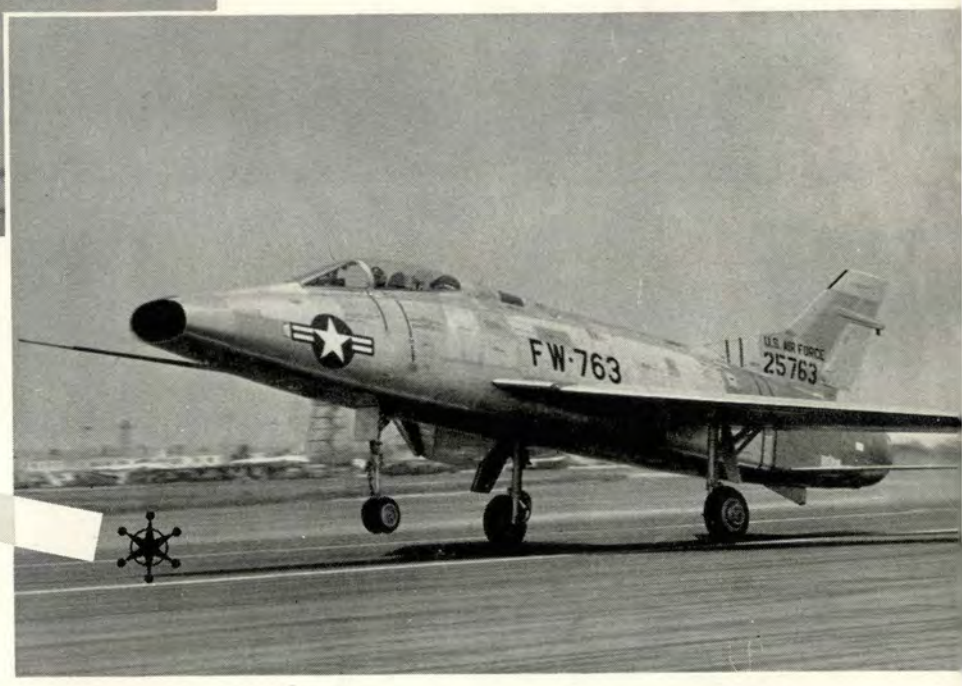
Going down the runway doing 120 per
I'm not sure the bird will fly.
Oh! Raise the barr- - ier - - -
Most of the runway is far behind
The rest is slick and wet.
Mayday, Mayday, Mayday!
Tell me, how do I stop this jet.

THIS IS ANOTHER verse for an old Air Force song which has been sung on fighter bases the world over. The only sad part about it is that the situation described is occurring with increasing frequency. The problem arises because the takeoff distances required for our jet fighters consume most of the available runway before it's time to get airborne or raise the nosewheel. If the situation arises wherein the takeoff cannot be accomplished successfully, there isn't enough runway left to stop.

Let's look at the record for 1955. In the past year there have been 76 aborted takeoffs by jet fighters. These aborted takeoffs resulted in the destruction of 28 aircraft (equivalent to one squadron) and substantial damage to 48. The primary reason for the aborts, as stated by the survivors, was that the aircraft did not appear to be accelerating properly and it was not felt that sufficient runway remained to take off.

Nearly all of our runways are marked at 1000-foot intervals (if yours aren't, tell the FSO), and pilots should not be in doubt about distance remaining. Nevertheless, the records indicate that we have a problem in determining acceleration rates accurately and distance available during takeoff roll. Now that we have a problem, what can the JP-4 jockey do about it? The best thing is to check the acceleration rate at some point down the runway in time to allow ample stopping distance. SAC pilots use such a procedure. The official terminology is "line speed check." The line speed check provides a method for checking speed during the initial part of the takeoff run. It gives

If you are flying a jet aircraft and the strip is hot and high you can buy a little more insurance. It only involves making a "line speed check."



Point

the pilot a good indication of his acceleration in time for him to successfully abort the takeoff if the bird is not performing properly.

Using the graphs provided in the current F-84F Dash One, examples of which are shown here, it is possible to predict two line speeds for a given line or check point on the runway—

- *Normal line speed* which assumes normal takeoff ground roll distance.
- *Minimum line speed* which assumes that the entire runway length will be used for the takeoff ground roll due to low acceleration.

To minimize the number of aborts and assure full utilization of available runway length, the minimum line speed should be used for the acceleration check. If the observed speed at the check point is equal to or more than the minimum line speed, takeoff acceleration is acceptable and the takeoff should be continued. If it is less than the minimum line speed, the takeoff should be aborted. Since the check point is chosen so that the airplane can be stopped on the remaining runway from the normal line speed, it will be less difficult to stop with a speed less than minimum line indicated airspeed.

Now let's take a hypothetical situation and see just how we can use the available charts to insure either a successful takeoff or a timely abort. We will use 4000 feet as our probable safe acceleration check point, along with the following:

- Takeoff gross weight — 22,300 pounds.
- Configuration — clean + (2)-230 gallon inboard tanks.
- Pressure altitude—2000 feet.
- Runway temperature — plus 35°C.
- Length of available runway — 9000 feet.
- Dry, hard-surfaced runway conditions.
- Zero wind.

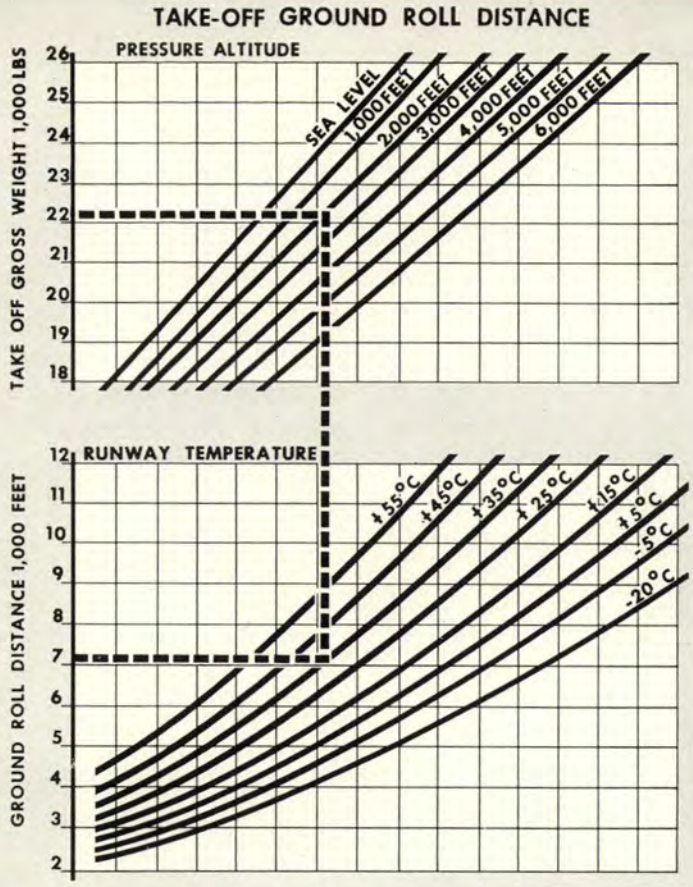


Figure 1

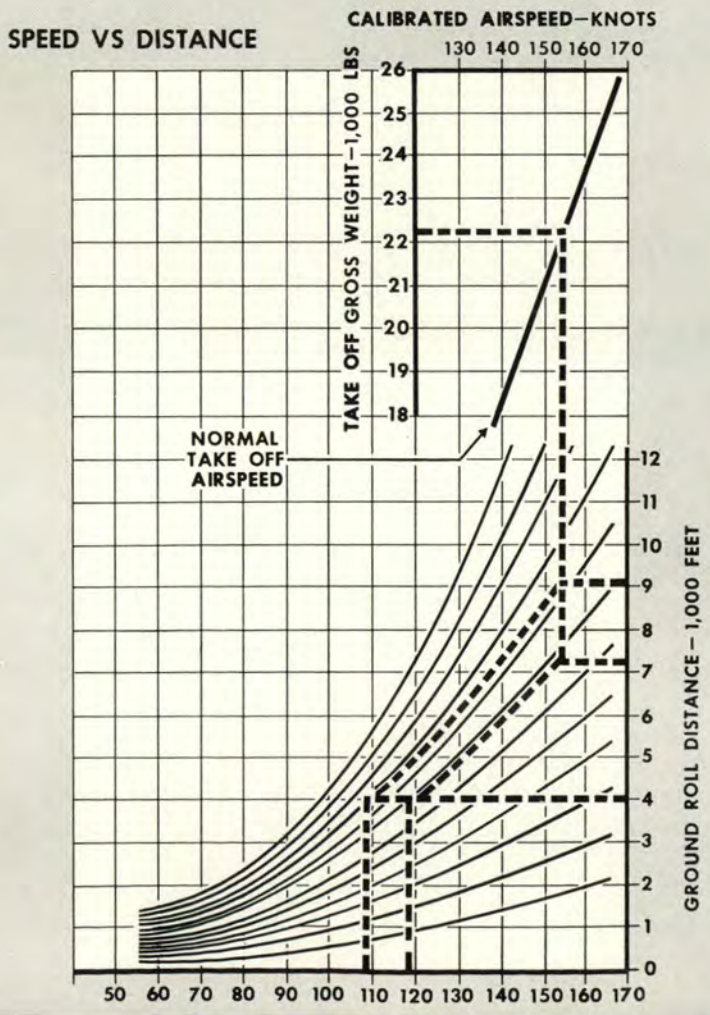


Figure 2

Takeoff Roll

Using Figure 1 at the takeoff gross weight of 22,300 pounds, proceed right to pressure altitude line of 2000 feet. Then trace down to the runway temperature curve of plus 35°C. Ground roll distance of 7250 feet is found at the left.

Normal Line Speed

Referring to Figure 2 at takeoff gross weight of 22,300 pounds, proceed up and find normal takeoff calibrated airspeed of 154.0 knots. Then look down until the guide line intersects the ground roll distance of 7250 feet. Now follow the curve, down to the left, to the 4000-foot distance intersection. The normal line speed of 119 knots CAS is then found at the bottom of the chart.

Minimum Line Speed

To find the minimum line speed, again use Figure 2 at the takeoff gross weight of 22,300 pounds. Read up to find normal takeoff airspeed of 154.0 knots CAS. Then proceed down until guide line intersects the available runway length of 9000 feet. Now look down and to the left, following the guide lines, to again intersect the 4000-foot distance. A minimum line speed of 109 knots CAS is indicated at the bottom of the chart.

Stopping Distance

The stopping distance can be found by referring to the chart illustrated in Figure 3. At a normal line speed of 119 knots CAS, correct for pressure altitude of 2000 feet and outside air temperature of plus 35°C. and intersect the stopping distance curve. Stopping distance required from normal line speed is 2825 feet.

No conservatism or pilot reaction time is provided in Curve A, Figure 3, as pilot reaction time in deciding to abort the takeoff is variable. However, the average pilot will use about three seconds to make a decision, cut power and apply brakes. Therefore, to facilitate ease of planning, Curve B includes a pilot reaction time of three seconds, a total stopping distance of 3450 feet. Thus, on a 9000-foot runway, it is possible to make a check at 4000 feet and still have time to stop, for 4000 + 3450 = 7450 feet.

The specification which establishes requirements for pilot handbooks has

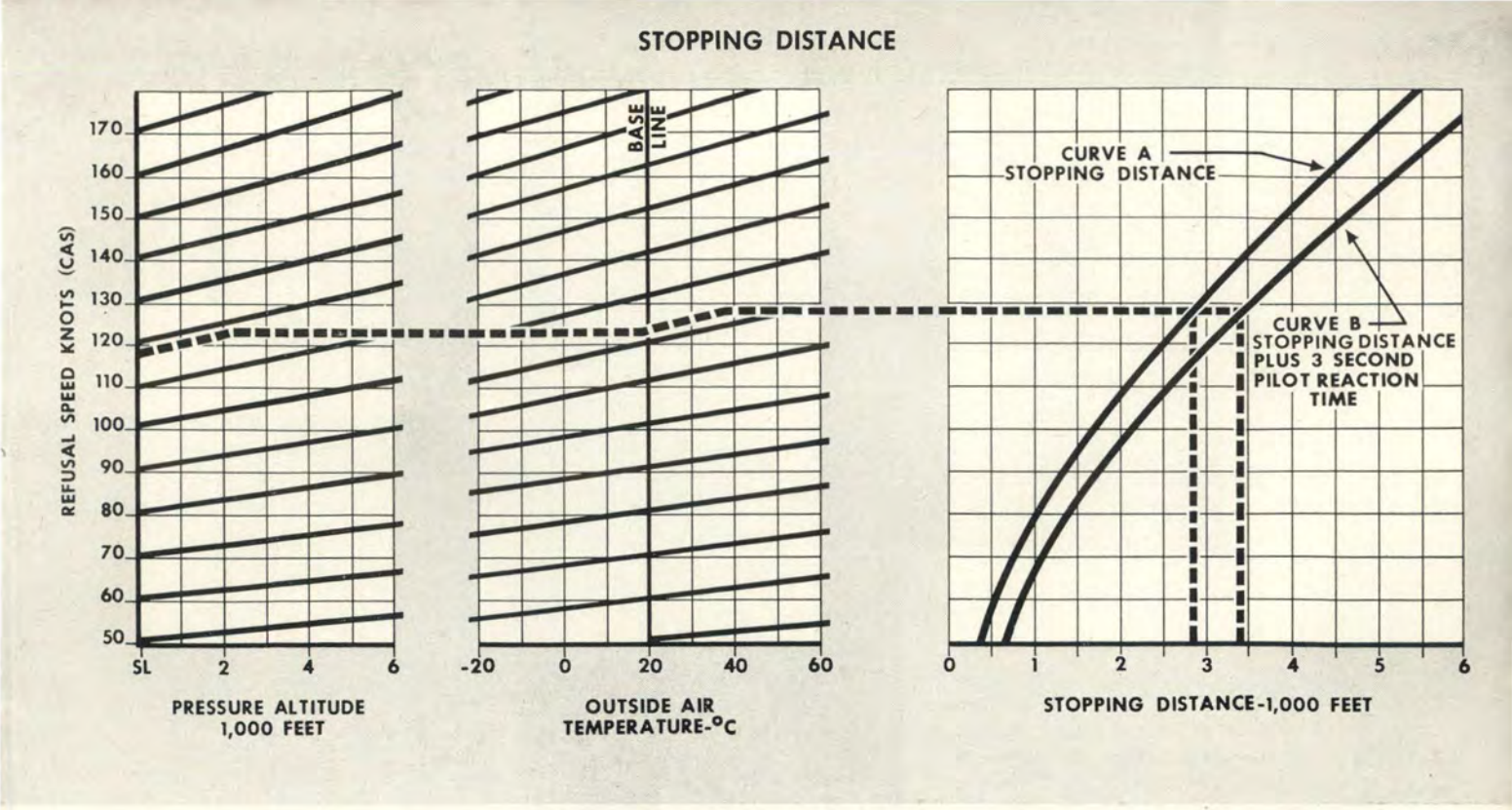


Figure 3

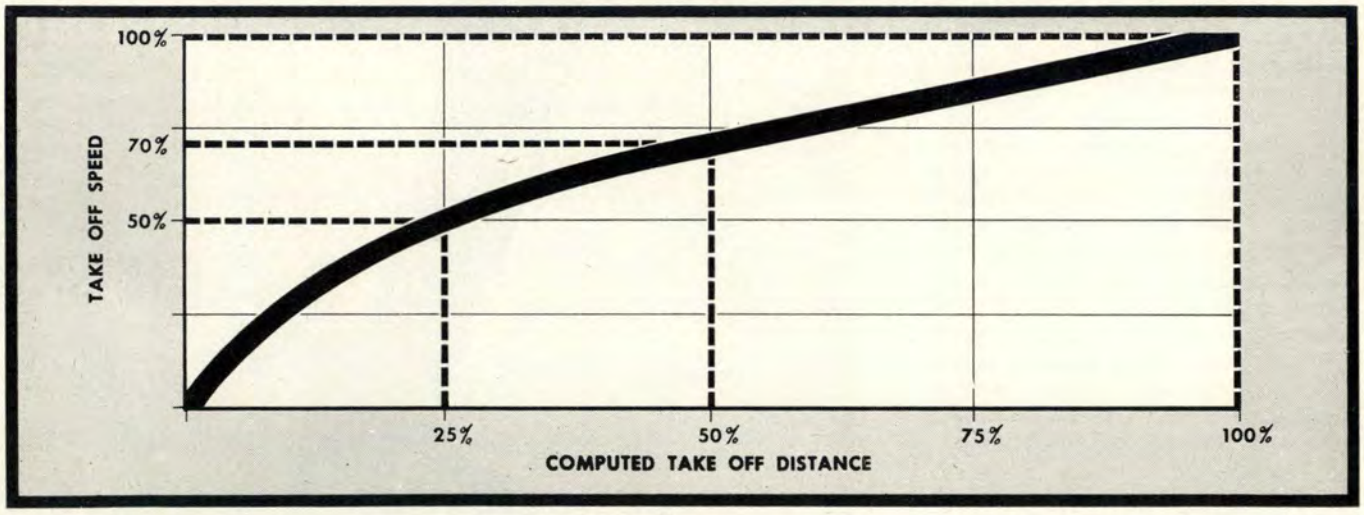


Figure 4

been revised to provide this information in the aircraft performance section. However, if the charts are not available, this simple formula will provide you with a line speed at a desired point on the runway:

$$\frac{V_2}{V_1} = \sqrt{\frac{S_2}{S_1}}$$

V_1 = computed takeoff speed.
V_2 = line speed at desired check point.
S_1 = computed takeoff distance.
S_2 = distance down the runway check is desired (a point should be chosen which will allow sufficient stopping distance).

Let's work one. Consider your takeoff speed as 145 knots; takeoff distance 7000 feet and you want to check your speed at 4000 feet.

$$\frac{V_2}{145} = \sqrt{\frac{4000}{7000}}$$

$$\frac{V_2}{145} = \sqrt{.57}$$

$V_2 = .75 \times 145$
$V_2 = 109$ knots.

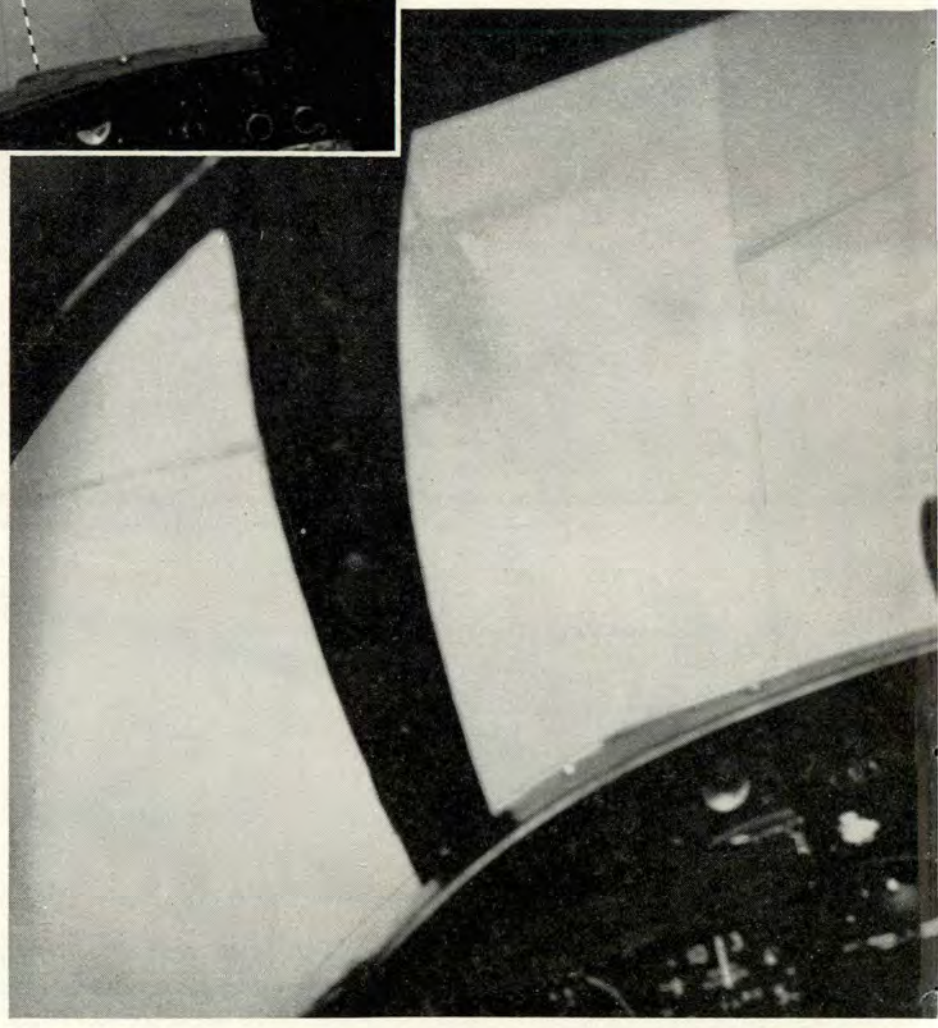
So you should have a minimum of 109 IAS after rolling 4000 feet.

Now, if all of that calculating tends to give you a headache, here's a method that's easy to remember.

At 50 per cent of your computed takeoff distance you should have 70 per cent of your takeoff speed. Note Figure 4, it illustrates the computed takeoff distance.

If the graphs are available in the handbook for your aircraft, use them. However, these other methods will provide a suitable line speed check in sufficient time to allow a successful aborted takeoff. ●

The



Rain repellent has been applied to the right side of the windshields above. Notice how vision is improved during heavy rain. Top photo shows no distortion present during clear weather flying.

ANY PILOT flying through rain is faced with a vexing problem—windshield visibility. A windshield wiper cannot be counted on for good clearing action when heavy precipitation is encountered particularly when flying at the approach speeds of modern jets.

Recently, windshield rain removal tests were conducted on a B-47 at Wright Air Development Center (WADC) under various intensities of precipitation. A water repellent coat was rubbed on the windshield. When raindrops struck the windshield, they were quickly swept off by the airstream. This left the windshield relatively clear and free from distortion. In addition to rain repellent tests, a modified standard wiper system incorporating a shorter stroke, shorter blade and higher blade pressure was tested and showed favorable results in light and moderate rain but was unsatisfactory in a heavy and thick downpour.

Tests

On one flight, a water-filled KC-97 tanker was used to furnish rain conditions of desired intensity established by varying the distance between the tanker and the B-47 test aircraft. Cameras and test instruments were installed to record results during taxi and flight operations. One-half of the B-47 windshield was treated with a selected repellent and the other half remained untreated. In all cases the treated side afforded better visibility in varying degrees depending on taxi, takeoff, approach speeds and rain intensities. While optical distortions such as glare, twinkle and halo were not evident on the repellent windshield area, glare was noted on the untreated side during a night flight in moderate precipitation.

Rain repellent effectiveness during taxi operations depended on the rain intensity, droplet size and aircraft taxi speed. It was determined that airflow of sufficient velocity over the windshield must be maintained since, when taxiing below 30 knots, water droplets had a tendency to adhere to the windshield rather than blow off. During takeoffs in light and moderate rain the treated side was clear but the untreated side had rivulets of water running vertically over the windshield.

Pilots indicated that rain repellents were very good during takeoffs in moderate to heavy precipitation. Visibility restriction seemed to be due to the weather rather than water on

FORWARD LOOK

L. V. Larson, Wright Air Development Center

the windshield. Through the treated side the runway was clearly visible but it was not distinguishable through the untreated side.

Application of the repellent is comparatively simple but the windshield surface must be clean. Bond paste is first applied with a soft clean rag in spots about four inches apart, then rubbed briskly until spread over the entire area. A coat of repellent is then applied over the bond treated area and rubbed briskly with a clean cloth or tissue until the surface is clean. Average application time is five to 20 minutes, depending on the experience of the maintenance personnel.

The effectiveness of a modified wiper system for rain removal proved very good up to moderate precipitation during taxi, takeoff and approach, but in heavy precipitation, with wipers on full speed, the windshield remained flooded.

A combination of rain repellent and modified or standard wiper system was the best for providing visibility under all conditions of rain intensity and aircraft speed.

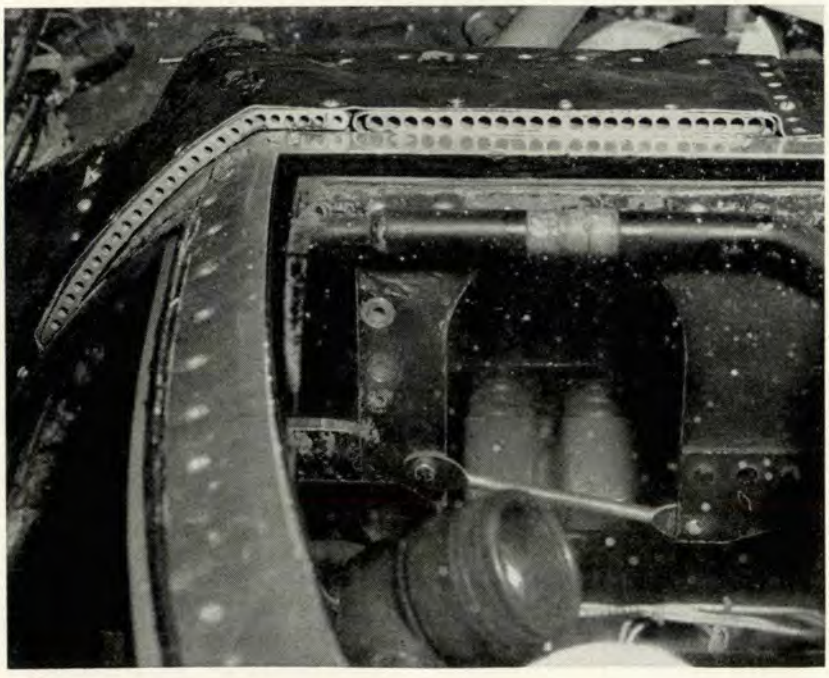
Another approach to the problem of rain removal is to clear the windshield by means of a hot, high velocity air jet on the exterior surface. The jet blows most of the water away and evaporates the remainder. This method was pioneered by North American on the F-86 and F-100 series and is programmed for several fighters and bombers.

Modification

The windshield air jet on the F-86 series was originally intended to provide windshield anti-icing. Use for rain removal was something of an afterthought. Tests of the F-86D at WADC indicated that the system originally installed was effective only in light rain. Therefore, more air was directed into the jet. Fortunately this could be accomplished simply by changing the setting on a pressure limiting valve from 6 psi to 10 and finally to 17 psi. All air was directed to the center panel with none to the side panels. Rain repellent was applied to the side panel. This change also requires addition of a thin layer of non-conducting material over the bottom edge of the windshield to reduce temperature shock and windshield breakage that would otherwise possibly occur.

During level flight and simulated GCA approaches the tests indicated good clearance on both repellent coated and air jet areas. As the rain intensity increased, the repellent coated area flooded first. Shortly thereafter vision was lost on the air jet area. No clearing was obtained on the air jet area during an overhead approach and landing. The engine RPM carried in this type of approach and landing does not supply enough airflow to the nozzles to clear the windshield sufficiently.

The windshield air jet on the F-86 was originally intended to provide windshield anti-icing. But, by increasing the air pressure, the installation proved fairly successful in removing heavy rain.



Two Jobs

The external air jet does two jobs: Anti-icing and rain clearing. Rain repellents have the obviously desirable feature of almost zero weight. Future research is aimed at obtaining repellents that will withstand temperatures associated with supersonic flight. On new aircraft, pilots can expect to have mixed systems. Rain repellents to give good vision under most rain conditions plus an air jet on a small area for ice protection, extreme rain and those unfortunate cases where someone didn't think it was going to rain and forgot to apply the repellent before takeoff. ●

REX SAYS

I READ AN article in the April issue of FLYING SAFETY about a pilot ejecting at low altitude, who lived to tell about it. I'm alive today because of what the pilot emphasized . . . practice, practice and more ejection practice.

Our squadron phased into the latest jet fighters. In my leisure time I parked myself in the cockpit of one of these dudes and went over the ejection procedures. Guess I was like this TV actor who plays the part of Wyatt Earp. It's said that he could draw and fire in a fifth of a second. I can't match that speed, but I got so I could simulate an ejection in seconds without a bumble.

I had flown the new bird for about 20 hours and liked her a lot. Then one morning I had an emergency. Immediately after takeoff, heavy smoke filled the cockpit and I was unable to see. I blew the canopy and observed flames around my left foot. I climbed the aircraft steeply to gain bailout altitude. I ejected while climbing at an estimated 60-degree angle. I must have been at about 2000 feet. My hands automatically went to the right controls. Everything worked smoothly. That's why I'm here.

REX SAYS—*Congratulations! Nice to have you around. We appreciate hearing how one of our articles contributed to an actual save. You did a right smart job; makes us feel worthwhile to know we had something to do with it.*

★ ★ ★

I GUESS I'm like many other pilots of the younger set. I place too much reliance upon Flight Service and jet metro watch to keep me out of weather trouble.

I know now that Flight Service is not responsible for flight following. Sometimes, because of mechanical breakdowns in the communications system, I have landed at air bases ahead of my flight plan.

I was caught unawares one day when the weather at destination did a 180 from VFR to IFR in about 30 minutes. My alternate did the same quick change. I got down okay but I don't like to discuss it.

My story boils down to one thing. I didn't listen to scheduled weather reports in flight. I didn't ask for any. I gave the required position reports and that's all. I overflew some air bases that had pilot-to-forecaster service available. I could have gotten a landing forecast from them, had I wanted it. Normally, INSAC stations do not give this type of forecast. The old song and dance of getting over a final fix committed to a penetration regardless of the existing weather won't hack it with me anymore. Nowadays, I get a forecast en route.

REX SAYS—*There have been a few recent accidents where the cause factor was failure to check destination and alternate weather, while en route. Pilot-to-forecaster service also is available at many bases. (See "Lucky 13," FLYING SAFETY, March 1956.) Why not use it?*

★ ★ ★

I KNOW THAT Rex's "IN" basket must overflow at times with stories of flying experiences that have taught pilots important lessons about flying. Well, I'd like to submit mine for what it's worth.

I had only 11 hours in the F-84 type aircraft before my episode and had not flown in one for the past 80 day period.

I made the customary inspections

REX SPECIALS

A CONSIDERABLE number of unsatisfactory reports have been received on the MA-1 and MA-1A landing arrester barrier. Both URs and engagement reports indicate no materiel failures but simple failure of the system to engage the aircraft. With proper installation, maintenance and inspection, the barrier should be 95 per cent effective.

It appears that the difficulty stems from lack of compliance with the T.O., use of non-standard equipment and lack of assignment of responsibility.

Base FSOs should take a double check to see that the barrier is properly installed, maintained and inspected. Wright Air Development Center should be contacted prior to any locally devised modification.

Patience Gridley, when the weight of the paper work equals the weight of the aircraft, we'll be cleared to go!

and checks and received clearance to taxi out for takeoff.

Approximately two minutes after takeoff, the engine vibrated violently and there was an explosion in the aft end. I declared an emergency and headed for home.

Now, my ineptness appeared. Not having flown this model in well over two months, the cockpit suddenly looked like a watchmaker's shop. Everything seemed to be fluctuating. I guess I hit a few wrong switches and did some other obvious things out of sequence.

I found myself on the final with a high landing airspeed and holding an unaccustomed amount of back pressure. Why? Well, in all of my haste to get back on the ground plus the unfamiliarity with the cockpit, I had failed to retrim after extending the landing gear and wing flaps.

My final approach was erratic. I had an excessive glide angle and I made contact with the runway in sort of a sideslip. Why the gear didn't fold is beyond me.

The only reason I tell this is to bring out the following point. I thought that I was current in this type aircraft. I might have been current on paper but I certainly wasn't proficient or current when something went wrong. I believe the directives now, when they say that a pilot must complete frequent flights in order to maintain proficiency.

REX SAYS—*I only wish more pilots would believe the same thing. The accident rate would really take a nosedive.*

★ ★ ★

IN ONE OF OUR daily squadron Flying Safety meetings, the FSO nailed some of us IPs about simulated emergency flight procedures. I didn't give his statement much thought right then, but what happened two days later brought his warning vividly to mind.

My job was to check out in the B-26 all newly assigned second lieutenants. I have always tried to be as realistic as possible about emergencies, especially during single engine operation.

During this particular check, I had a lieutenant making an ADF approach to the field. We were letting down to minimum altitude when I cut an engine on him. He went through the procedure right rapid like, but as he was doing it, he was inadvertently pulling back on the control column. I thought I'd let him go a little farther before I took over. Then for some unknown reason, he horsed back on the column and we were in trouble. The B-26 shuddered before I could push forward. By the time I got the faltering bird level, we were skimming the tree tops and I had little trickles of sweat running down my cheeks.

I know that I did two things wrong. First, I permitted practicing simulated single procedures at low airspeed and low altitude; second, I let confidence in my flying ability override my judgment when I chopped that engine. All I can say is, "Brother, never again!"

REX SAYS—*Recent accidents have occurred which reflect these same types of faulty practices. Don't let a simulated emergency turn into the real thing.*

★ ★ ★

I'M SENDING this hazard report to Rex for what it's worth. I was the pilot involved.

It was a warm spring day with winds gusting from 35 to 45 knots. I had just completed my flight and was crawling out of the cockpit of my F-86. As I stepped on to the wing, I was not aware that the key attached to the automatic chute arming lanyard had hung up in the canopy rail. The lanyard was pulled and the automatic release activated. As my back type chute popped, I grabbed on to the canopy, but the wind was too strong and I was yanked off.

Fortunately, I had on my B-15 jacket, my gloves and hard hat. My head struck the open speed brake door, then the ground. I rolled over on my side and had a rough 300-foot ride before my chute tangled with a ground object and I was able to collapse the canopy.

I was extremely lucky. I was only skinned and bruised. What can pilots do to prevent this sort of thing from happening in the future? Here are my personal ideas:

- Make sure the crewmembers are aware of this hazard.
- Install a small pocket on the harness to hold the key and strap.
- Have crewmembers attach the strap and key to the lanyard just prior to flight and remove it before leaving the seat.

REX SAYS—*That was quite a ride! Your recommendations make sense. I, for one, plan to make sure that key is safely out of the way when I leave the cockpit.*

No Strange Fields

The book containing the low approach and landing charts has more names than a Spanish nobleman. It is called The Pilot's Handbook, PHACUS and Letdown Book, just to name a few. Regardless of what you name it, it fits neatly into your own preflight picture.

HE HAD HIT his ETA right on the nose. Another hour and he would ask for permission to start his penetration.

He pulled the low approach and landing chart handbook out of his coverall pocket and flipped it open to the proper page. His experienced eyes focused systematically on every detail. He forced open the circular rings and removed the page from the book. He placed it under the hold-down snap on his left thigh.

Silently, he mused, "According to that last weather report I should break out about 800 feet. With the vis holding at one mile, there should be no sweat."

One hour and ten minutes later he was walking into base operations.

What is all of this leading up to? By this time in an article, the pilot has either made a flagrant mistake, declared an emergency or has encountered severe weather elements and is just about out of fuel. What gives here?

Simply that most of the successful flights made by pilots these days are the products of proper preflight planning. This includes referring to the appropriate instrument low approach and landing chart . . . before takeoff, as well as just prior to starting your letdown.

How does this book fit into the preflight picture? Join me as I look over the shoulder of our imaginary pilot. He is studying the landing side of one of the charts.

"Hmmm, parallel runways. 32R is 8000 feet long and 200 feet wide. Any obstructions? Oh, oh, a couple of 350-foot smoke stacks just to the right of the approach to 32R. Also a 500-foot tower off to the left." He mused.

"It is always a good idea to know as much as possible about the airfield layout and adjacent area. In case your letdown isn't just right and you drift too low or off to one side, it's nice to know where the obstructions are located. Tangling with one of those smoke stacks or TV towers isn't exactly conducive to longevity."

He saw me leaning forward.

"Also, when I break out I like to know what to expect. How many times have you suddenly become contact and found yourself staring at a confusingly unfamiliar maze of runways and taxiways?"

I didn't answer.

He turned back to his work and his finger underlined the heading and distance to the field from the radio aid. Next, he looked at the lighting data, availability of a rotating beacon, obstruction lights and type of approach lights.

He looked up and said, "Checking this side of the chart during preflight need not be a lengthy process. What I am after is a general idea of what to expect. Some airfields have odd layouts, high obstructions, no taxiways, lights and so on. It's just plain good sense to check before leaping off."

He then flipped the sheet over to the "low approach" side of the chart. He quickly noted the type of radio facility, initial penetration altitude and type of penetration or procedure turn. Next, his gaze concentrated on the most important part of all.

"The landing minimums are 500 and one. Shouldn't be too bad, and the missed approach procedure is to turn to a heading of 150 degrees and climb to 7500 feet."

"It is important to remember the initial missed approach heading. While cleaning up the bird for a go-around you certainly don't want to have your head in the letdown book trying to find the missed approach heading."

Satisfied, he walked over to the dispatch counter, his preflight completed. He was stuffing the 175 carbon in his pocket as I stopped him short of the door.

"Is that all there is to using the Pilot's Handbook?" I asked.

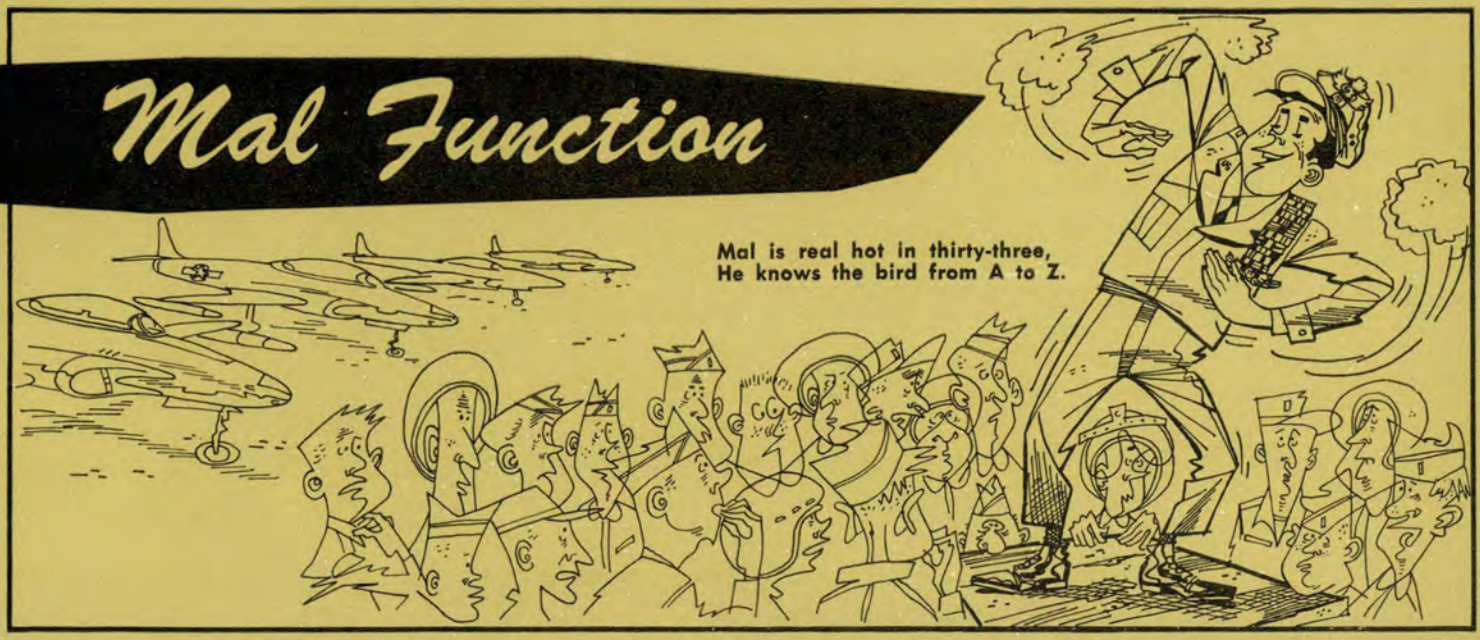
"During preflight, yes. But I'll pull the chart out before my ETA and go over it again and have it ready for reference. Then, when I make my letdown I know what to expect. I've got the whole picture."

Every day there are flights made by pilots into strange fields. The sharp pilots don't wait until they receive letdown instructions before looking over the chart. They know what to expect before, during and after the letdown. And when they break out they know how the physical layout of the field will appear. To them, there are no strange fields. ●

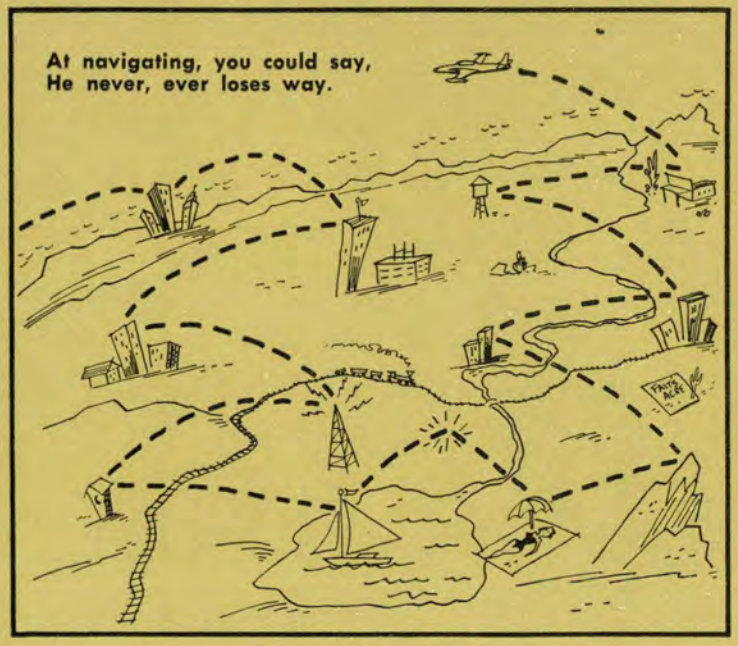
REAL COOL . . . . . .

It's okay for this little gal
to sport light, skimpy apparel. She
isn't about to leap off to 40,000 feet.
Up there, it's real cool !
Don't let the heat on the deck
dazzle you into leaving half of your
flying equipment in the ready room.
The many reasons for wearing proper clothing
will easily off-set those few minutes of
heat discomfort on the ground.

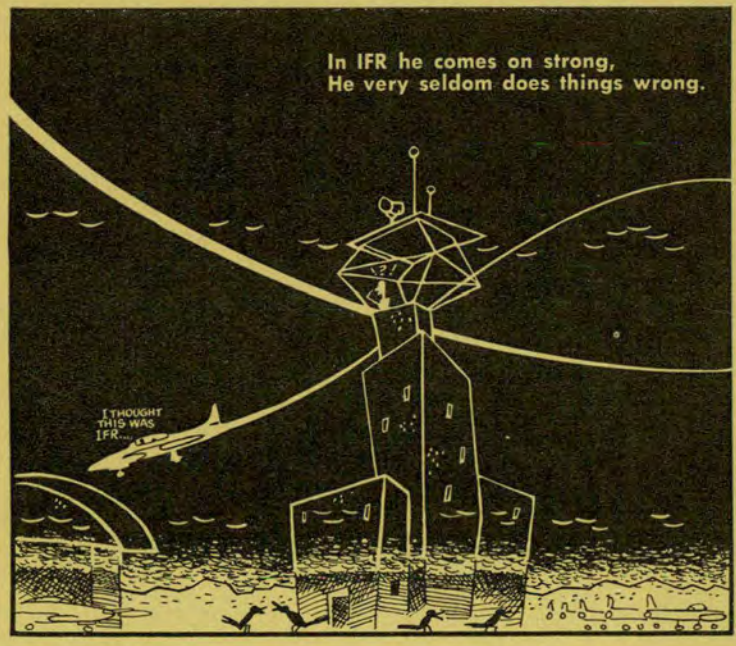
Mal Function



Mal is real hot in thirty-three,
He knows the bird from A to Z.

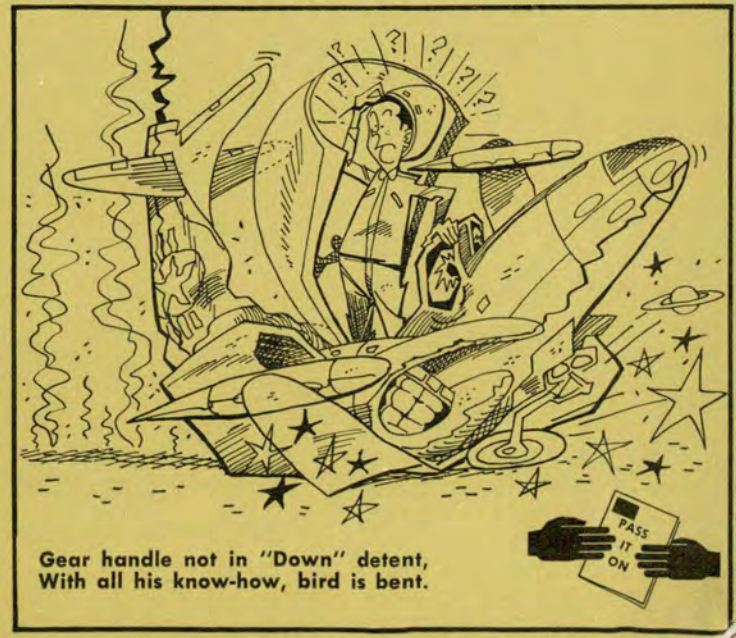


At navigating, you could say,
He never, ever loses way.



In IFR he comes on strong,
He very seldom does things wrong.

Now one fine day he pitches out,
And calls 'Gear Down," without a doubt.



Gear handle not in "Down" detent,
With all his know-how, bird is bent.

*U. S. GOVERNMENT PRINTING OFFICE . . . 362337