JANUARY 1953

FLYING SAFETY

UNITED STATES AIR FORCE

the
shape of planes
to come

This Month . . . The F-102, which "brews" no good for the MIG, is featured on the front cover. On page five, you'll find a short rundown on the coming new *USAF Delta-Wing Fighter*, which has some remarkably foolproof features.

The *ejection bailout* story on page two is, we feel, as authoritative as you'll find anywhere. It reflects the study being made on the subject by the Directorate of Flight Safety Research's Medical Safety Division.

This month's full length "real life" feature, *"In God We Trust,"* is the true story of what happened to one pilot who "forgot" about a few essentials, and lived to tell his story. The anonymous author, who put this yarn on recording tape for us, is to be congratulated for his frankness in telling this story on himself, and for his cooperation in telling the story to us.

You can look forward to some meaty articles in February and March FLYING SAFETY. Of particular interest to you will be the results of exhaustive research studies on weather accidents and taxi accidents, both of which are of importance to every flying man from pilot to commander. Plans are now being formulated for an "all weather" issue, which will be worth a slot in your permanent files.

Muchas gracias . . . señores . . . To the Consolidated Vultee Aircraft Corporation (Convair) for information and photographs on the F-102; to the RCAF "Roundel" for material contained in "It's In the Wind"; and to the Sperry Gyroscope Corporation for the story "High Latitude Navigation," we extend a sincere "thank you."

The Delta XF-92A; design for interception, see page 5.

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FLYING SAFETY

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Accepted for the USAF *at Bermuda on 20 November 1952. The presentation of this award was based upon the efforts of the Directorate of Flight Safety Research in inspiring design engineers to consider safety on the same level of importance as performance, and for uniting both into a concept of greater overall operating efficiency. Also considered was the contribution of the Directorate of Flight Safety Research in establishing, at university level, the first course in principles of air safety and accident investigation.*

Bail Out!

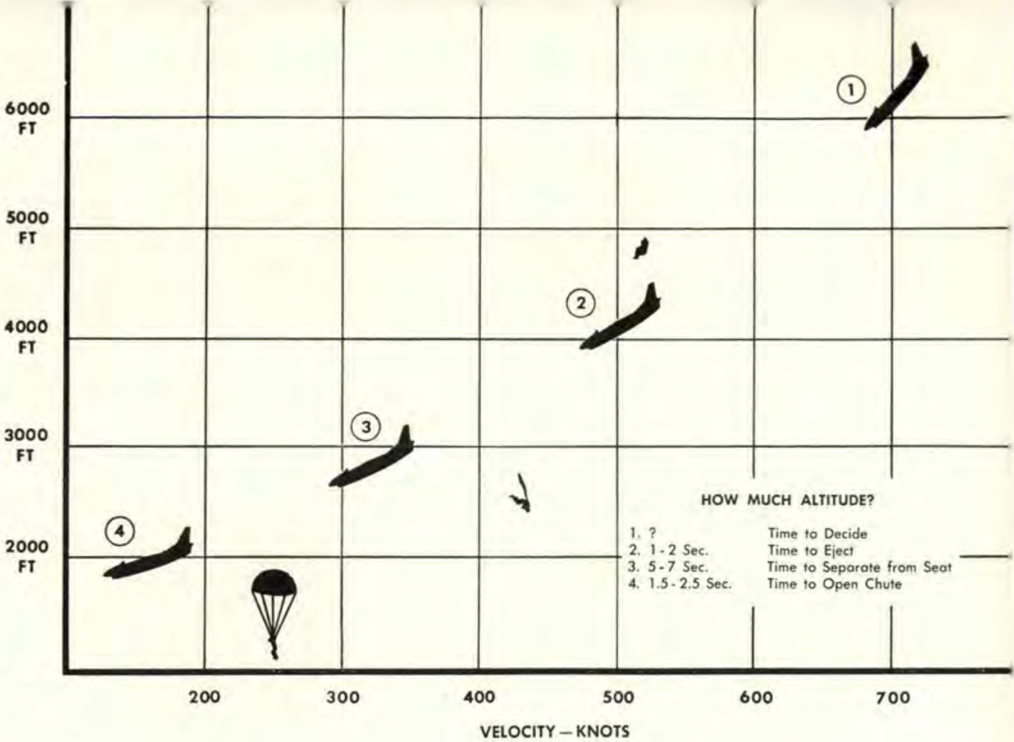
THERE is an old military maneuver, employed when the odds against safety of life and limb are overwhelmingly unfavorable, known as "getting the hell out of there." Facetious though it sounds, it contains more than a modicum of common sense. As a last-ditch tactic it has particular significance for the jet jockey who finds himself in extreme difficulty at low altitude. When his altitude is in front of him and he has run out of everything including ideas, it is then time to remember the wisdom of the ancient maneuver and time to part company with the pipe.

When parting becomes necessary, there is only one sure way to leave the aircraft—by way of the ejection seat. Understandably, some pilots react adversely to the suggestion that they explode themselves into the atmosphere. But the fact remains that it enhances their chance to survive. At 500 MPH, in level flight, air blast alone imposes a load of more than two tons on a pilot. Were he to attempt a bailout against this force, he would find himself pinned, half in and half out of the cockpit. If the aircraft were to go out of control and enter violent maneuvers—as a jet often does in emergencies—the pilot then would encounter G loads of such magnitude that he would find it difficult merely to move his hands to fire the seat.

The ejection seat has two principal virtues. First, it counteracts G-loads and guarantees that the pilot will not "hang up" on the aircraft when he leaves. Second, it fires to a height approximately 60 feet above the aircraft, carries the pilot well above the tail and virtually eliminates any possibility that he will strike the vertical stabilizer. Indeed, reports indicate every pilot who has ejected has cleared the tail successfully.

Time and Altitude

At low altitude this problem of ejection is complicated by the factor of time—or lack of it. Precious seconds lost in deciding whether to eject



or ride the jet down can mean the difference between life and death for a pilot. A study of ejection seat bail-outs over a three-year period, conducted by the Medical Safety Division in the Directorate of Flight Safety Research at Norton Air Force Base, proves the point.

The difference between 2,000 feet and 1,000 feet in a jet aircraft can be measured in seconds. But the study showed that this difference of 1,000 feet bears a critical relationship between life and death. The study disclosed that 80 per cent of those who ejected between 1,000 and 2,000 feet did so successfully. In contrast, only one-third of those who ejected below 1,000 feet survived. It can be, and has been, accomplished successfully but is not recommended as habit forming. One instance is already a legend in the Air Force. In this case the pilot ejected at 800 feet, inverted, and was still sitting in the seat when he landed without injury.

By and large, however, according to the study, pilots should eject above 2,000 feet. Approximately 92 per cent of all ejections between 2,000 and 10,000 feet were accomplished successfully. Only one fatality has been recorded among ejections made above 10,000 feet and in this case the pilot probably was struck by lightning during his 'chute-controlled descent.

The Medical Safety Study disclosed that the ejection seat has been successfully operated under these varying conditions: speeds of from 150 knots to 550 knots, at altitudes from 700 feet to above 30,000 feet, and at attitudes varying from straight and level flight to uncontrollable maneuvers.

Because cockpits have not been standardized, the procedure for ejection varies with the type and model of the aircraft. In the F-86A-1, for example, the first step calls for pulling the control to jettison the canopy. Then the right hand grip is pulled up to raise the trigger, the left hand grip pulled to lock harness, and the trigger squeezed to eject. In the F-86A-5, F-86E and F-86F, raising the right hand grip jettisons the canopy.

In the F-89B and C, the left hand arm rest is raised to jettison the canopy and lock harness. The right hand grip is then rotated to lower the seat and arm the catapult. In the F-94A and B models, on the other hand, a lever mounted on the right side of the cockpit beneath the canopy rail is pulled to the rear to jettison the canopy. Then the right rest is raised to arm the seat catapult and the left arm rest raised to lock shoulder harness. Finally the trigger on the right arm rest is squeezed to complete ejection.

One Correct Form

Despite this variety of procedures, there is only one correct form of posture. Feet should be in the stirrups, body centered, spinal column straight and firm against the rear of the seat, arms on arm rests and shoulder harness locked. In this connection it should be noted that many false rumors have been circulated to the effect that some pilots who have ejected have had their feet cut off. Nothing could be farther from the truth. Many pilots have not had their feet in the stirrups when they went out. But the most serious injury sustained was a broken ankle. No one has lost his feet — or even a foot. One pilot had his feet all the way in on the rudder pedals when he ejected and not even the calves of his legs were bruised.

There no longer can be any doubt of the merit of ejection seat training. The Medical Safety study showed that 14 of those who ejected had tower rides in addition to lectures. Each one landed successfully. However, among the group which had received lectures only, there were four fatalities.

The training tower ejection seat, using the same type of cartridge as is found in the aircraft seat, subjects the pilot to a momentary force of 14.5 Gs and moves him up the steel tower about 50 feet. The training seat serves two purposes. First, it allays the pilot's natural fear that ejection will subject him to excessive G forces. Second, it proves that ejection will carry him above the aircraft's tail surface. In the offing are mobile ejection seat trainers, which will include a cockpit. In these, every step in the ejection procedure will be simulated and if one step is forgotten, the seat will not eject.

Three cases were reported in which the canopy failed to jettison, and the pilots ejected through the canopy. One case resulted in minor injuries, one pilot received a simple fracture of the cervical vertebra, and one pilot was drowned, not as a result of ejecting through the canopy. Certain jet aircraft are now being provided with controls that permit the pilot to eject through the canopy if the jettison system fails. Present requirements call for inclusion of this feature in jet aircraft on both a production and retrofit basis.

A very real consideration affecting the success of ejections at low altitude is the time lost under stress of the emergency in getting clear of the seat. There is a natural tendency to pull the ripcord before releasing the lap belt and kicking free of the seat. Below 2,000 feet the time lost in clearing the seat could be fatal.

T. O. Technique

For this reason, T. O. 01-1-537 recommends that if the pilot can maintain proper position on the seat, he should unfasten the lap belt before ejecting at altitudes below 2,000 feet. The time saved by eliminating this step will enhance the pilot's chance of making a successful landing. Six successful ejections have already been reported in which the safety belt and harness were unfastened prior to ejection.

The importance the relationship time bears to successful ejection at low altitudes cannot be over-emphasized. It is generally agreed that between 7.5 and 11.5 seconds are required to complete the ejection process. The total breaks down this way:

Between one and two seconds to eject; between five and seven seconds to separate from the seat, and between 1.5 and 2.5 seconds to open the parachute.

It is imperative that jet pilots realize they cannot waste time deciding whether to eject or stay with the aircraft when they are losing altitude rapidly at high speed. For example: a jet barreling straight down at Mach. 1 will be losing about 1,000 feet per second.

In this case, preliminary studies made by the Directorate of Flight Safety Research indicate that the pilot makes a bad gamble with his life if he remains with the aircraft below 6,000 feet. This is so because he will lose between 1,000 and 2,000 feet in the process of ejection. Thus, if he fires the seat at 6,000 feet, he may be at 4,000 before he actually clears the aircraft.

In the five to seven seconds it takes to separate from the seat, the pilot will lose additional altitude — not at the rate of 1,000 feet per second but a loss none the less. This loss probably would be another 2,500 feet, taking the pilot down to 1,500 feet before he pulled the ripcord. Add another 1.5 to 2.5 seconds before the parachute opens and it becomes obvious that not much altitude is left.

In a recent fatal accident, in which a pilot waited too long to eject, an investigating board concluded that it takes approximately 10 seconds under ideal conditions to:

- Make up your mind to eject.
- Jettison the canopy.
- Fire the seat.
- Allow the seat to slow down and get out of it.
- Pull the ripcord of the parachute.

It is further suggested that in a 45-degree dive at 600 mph, the pilot will lose about 4,500 feet from the time it takes to make up his mind to bail out until he actually opens his parachute.

Based on these conclusions the commanding officer of the base ordered that all sections make high speed bailouts a special subject for their weekly Flight Safety meetings.

Other commanders might well be guided accordingly. ●

Ejection Bailout Procedure

STEP I . . . Separate all connections with the aircraft such as radio, oxygen, and anti-G suit. This step may be omitted if the emergency makes immediate exit necessary.

STEP II . . . If bailout is made at high altitude, remain connected to the aircraft's oxygen system while all other preparations for leaving the aircraft are being made. Pull ball handle on bailout bottle.

Ready . . .

NOTE: For bailouts below 2,000 feet altitude, if proper position on the seat can be maintained for ejection, unfasten the lap belt before proceeding with the ejection sequence outlined above.

In F-89 and F-94 aircraft, the occupant of the rear seat must remove the radar scope from the ejection path prior to ejection.

In F-89, F-94 and T-33 aircraft, the occupant of the rear seat should eject first unless otherwise directed by the pilot.

Get set . . .

STEP III . . . Jettison canopy. (Keep head and body as low as possible when pulling canopy release.) *STEP IV* . . . Lock shoulder harness.

STEP V . . . Place feet in foot rests. *STEP VI* . . . Place arms on arm rests—close to body.

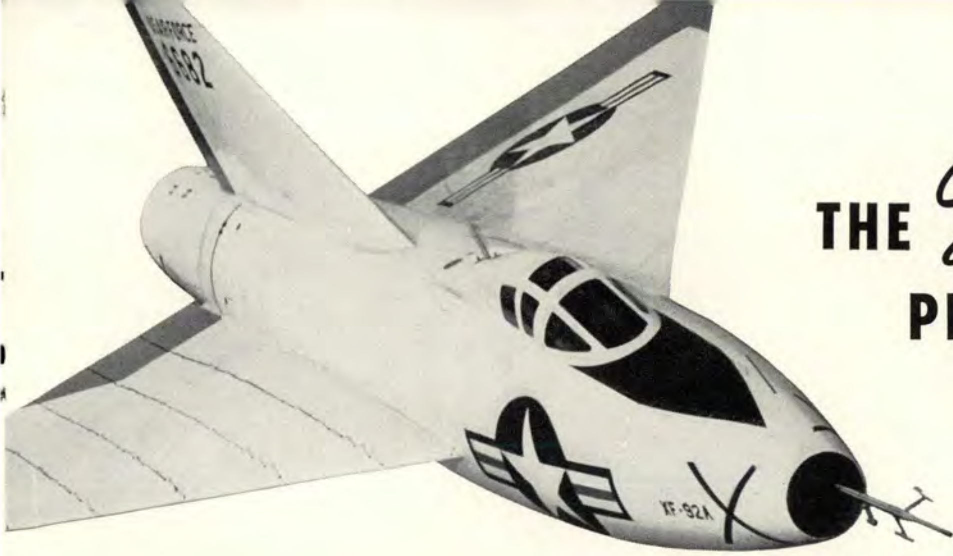
STEP VII . . . Sit erect with head hard against head rest.

STEP VIII . . . Squeeze trigger.

STEP IX . . . After seat has been ejected, release safety harness and kick away from the seat.

STEP X . . . Delay opening parachute as long as altitude will permit to allow seat to clear parachute canopy and reduce parachute opening shock.

Fire!



THE *Shape* OF PLANES TO COME

The XF-92A is completing an Air Force evaluation program and will go to NACA for further research at an early date. The production model will be the F-102.

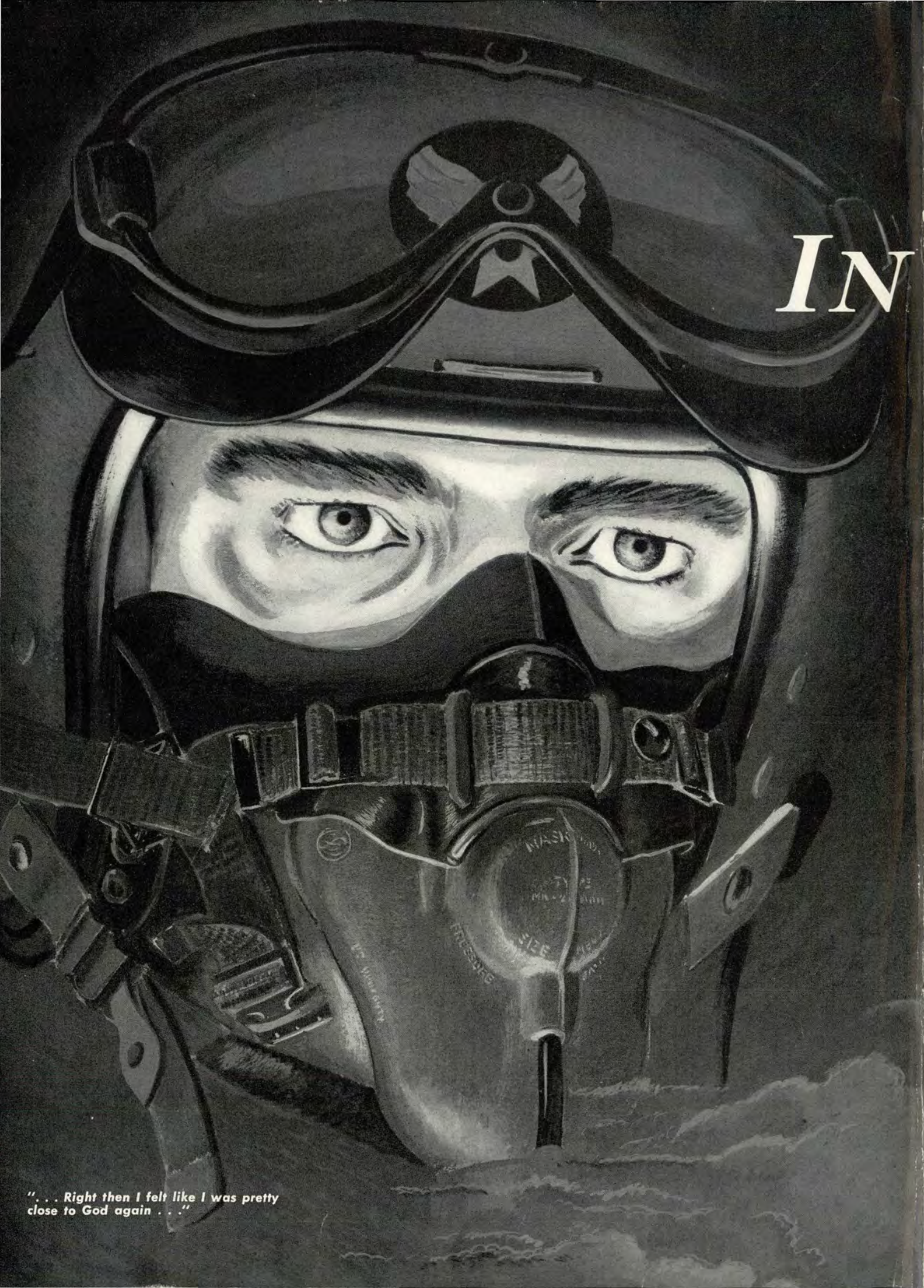
From the blinding white sands of Edwards Air Force Base arises a new shape, the deltoid shape of planes to come, the Air Force's new transonic fighter . . . the F-102. Now it can be told, for until recently the F-102's planform has been referred to only as a high performance interceptor. The delta-wing F-102 is the outcome of experiments with a research interceptor, the XF-92A.

The name "delta" stems from the fourth letter of the Greek alphabet, which is in the shape of an equilateral triangle. The true delta airplane has no horizontal tail, but is equipped with a vertical fin-rudder. It has "elevons" on the wing trailing edge. The F-102 has many safety features of interest to pilots. Says W. J. Martin, chief test pilot for Convair's San Diego Division, "There are two completely separate hydraulic systems for control boost . . . the pilot's canopy is spring loaded, and, when released, is forced by the airstream into a 90-degree position . . . in flying the delta-wing airplane I have maneuvered into steep banks and have pulled out at about as many G's as a pilot can take, and could feel no stall tendency. Where some fast jets develop violent vibrations from the shock wave, the delta gave no indication of abnormal flight characteristics at transonic speeds."

Convair designers summarize delta configuration this way: Less drag at transonic and supersonic speeds, better stability and maneuverability, little or no aerodynamic disturbances in the transition from subsonic to supersonic flight, economy in manufacturing due to absence of tail section, and larger wing areas that offer increased lift and more fuel space.

Important is the fact that the delta wing incorporates the three factors which tend to reduce drag rise in the vicinity of speed of sound: sweepback, low aspect ratio and wing thinness in per cent of chord.

According to the manufacturer, the F-102 gives many indications of being an extremely safe airplane in relationship to its high performance. ●



IN

". . . Right then I felt like I was pretty close to God again . . ."

In order to avoid embarrassment to those concerned, the name of the pilot and all geographical locations have been omitted. At the same time, full credit should be given the author for his voluntary report, which was originally a straight incident report, used so successfuly by SAC and certain other commands.

GOD WE TRUST...

f those weekend trips
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anyway," so
to land at Oa

and asked how long it was and they said it was 4,000 feet long. The shortest runway I had ever landed on was 5,000 feet.

I had about 360 gallons of fuel aboard; at this end of the runway was a fence, a road and some of those large Colonial type houses with tall, peaked roofs. I don't think they'll need any coal this winter; I warmed them up pretty well with my tailpipe coming in.

I landed just down from this end of the runway, with plenty of room to stop. Somehow I had pitched at the right spot and turned on base and final at the right places and I had made a perfect approach for landing.

Since the longest runway at Oakville was 4,000 feet, I said, "Don't put over 60 gallons of fuel in each tiptank. I'll go on to Lima AFB and re-fuel there in the morning." "Roger," they said.

obstructions at the head of the runway, there was a hill at the end of it with what had been three tall, sturdy oak trees. Now there were only two trees; someone had chopped the middle one down.

I cranked up and taxied to the runway. I sat there for awhile at 92 per cent, burning out some of my fuel. There was practically no wind, but fortunately it was fairly cool. I don't know how much fuel I burned out, but finally I said to myself, "Well, I think I can make it." I pulled my flaps up, moved onto the runway and ran 'er up to 100 per cent with the brakes on. After releasing the brakes and starting my take-off roll, I discovered something else—not only was the runway only 4,000 feet long; it was also uphill! As the airspeed came up to about 100 MPH, I put the flaps down to 30 degrees. I brought the nosewheel off and finally staggered off—between the two remaining oak

". . . there I was, at 35,000 feet on instruments with my first flameout . . ."

The winds were almost 180 degrees opposite than those I had been briefed on.

It was now Sunday afternoon. I hadn't planned on doing any night flying, so I hadn't brought a flashlight. I tried to get one. Everything was closed. Base Ops had none; Personal Equipment section had none they could give me, so I thought, "Well, I won't need one anyway."

I filled out my clearance and went out to the airplane, knowing that I would have some slight wait before my ARTC clearance was ready. I sat in the cockpit with an APU plugged in, standing by on the radio. When the clearance came, I copied it down, repeated it back to the tower and signaled to the crew chief to watch for the start. The start was a good one. I reached over to grab hold of the battery switch, looked back to signal the crew chief to pull the APU, and as I did, I caught a glimpse of a red flag out of the corner of my eye. Looking back up to the top of the canopy, I saw that the canopy pins had not been pulled. I called the crew chief. Here's where I really slipped up—in calling him over to pull the pins for the canopy and ejection seat, I had taken my hand off the battery switch and I forgot to turn it on.

I made an uneventful take-off and climbed out on course. I broke into the overcast at about 6,000 feet and continued climbing on up to 35,000 feet, which was what my clearance called for. I hadn't run into any layers which the weather office had predicted; it was a solid overcast all the way up to 35,000 and it wasn't a bit lighter up there than it was when I went into it. I continued on course until I figured that I was pretty close to Leetown, North Carolina. As all of you know who've tried to tune in and identify a station on the ARN-6 radio compass in the T-33, when you are in visible moisture or precipitation, clouds, or in the vicinity of a thunderstorm, the static is so complete on the set that you cannot identify the station. All you can do is crank the handle close to the KCs and hope that it's the station you want. I knew that I had an effective headwind of approximately 80 MPH, so by dead-reckoning I thought that I was near Leetown.

I had not been briefed on any icing. As a matter of fact, I was supposed to be clear of all clouds, no visible moisture, so I hadn't worried about any ice. Here's where I made another big mistake. I had taken off IFR into possible icing conditions although I had not been briefed on ice, and I had not turned on the pitot heat. The airplane started to get sluggish. I looked out at the tiptanks and saw about seven inches of ice cones sticking out on the leading edges of the tanks. I figured then that if ice was collecting there, I was getting some in the pitot tube. I reached down to the right and turned on the right console lights and looked back up at the flight indicator. I straightened out my wings and then reached down to locate the pitot heat switch. I felt it and took a quick glance down —flying in bumpy weather with my left hand—straightened out the wings again, took another quick check of that switch to make sure I had the right one, and I pressed it.

". . . I don't think they'll need any coal this winter; I warmed them up pretty well with my tailpipe coming in . . ."

". . . I saw about seven inches of ice on the edges of the tanks . . ."

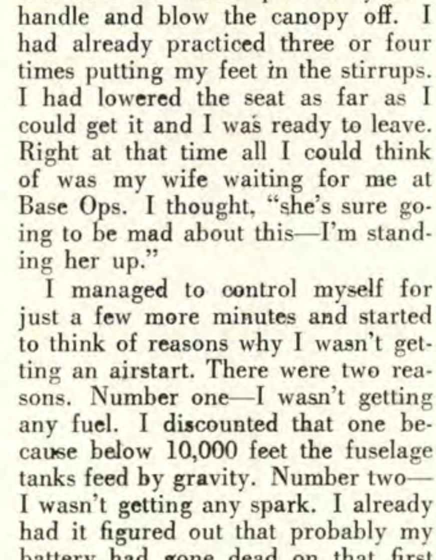
Never in my life have I ever felt so lonely! It was quiet, real quiet—it was the damndest quiet I've ever heard. There I was—at 35,000 feet on solid instruments with my first flameout in an aircraft with which I was not too familiar—I only had about 150 hours in the T-33.

I started immediately to get panicky and was about ready to begin an airstart, when suddenly it occurred to me that an airstart should not be attempted above 25,000 feet. I was at 35,000, had 10,000 feet to lose, so I decided to lose it right quick, make an airstart and come back up again. I lowered the dive flaps and lowered the nose to pick up that 25,000 foot level as fast as I could, paying strict attention to the RPM. As I got to 25,000, I drained the tailpipe. I might mention here that the hardest thing in the world to do when you're on instruments is to drain the tailpipe.

As I hit the airstart switch, the RPM had dropped to 20 per cent. The lights dimmed, the radio went out and I had no more electricity. I knew that as soon as the electric power went off, I'd be flying by the airspeed, period. However, remembering that the needle and ball are the last of the gyro instruments to go out, I went immediately to airspeed, needle and ball and RPM, trying to keep my RPM up to the desired 10 per cent. I pulled up the dive flaps so that I could be able to achieve the desired RPM and the airspeed necessary to hold it without losing too much altitude.

I made seven panic airstarts. I still couldn't get it started. I knew that in the vicinity of Leetown the highest mountain was somewhere around 6,900 feet. I also knew that way down before that I was going to have to get out of this thing if I couldn't get 'er started. As I passed through 10,000 feet I tried my seventh airstart and this time I went directly by the checklist to make sure that I wasn't forgetting anything. I still didn't get it. I immediately hit the panic button again and started to get out. I moved all the baggage, the maps and everything else away from the right side so that I could pull the yellow handle and blow the canopy off. I had already practiced three or four times putting my feet in the stirrups. I had lowered the seat as far as I could get it and I was ready to leave. Right at that time all I could think of was my wife waiting for me at Base Ops. I thought, "she's sure going to be mad about this—I'm standing her up."

I managed to control myself for just a few more minutes and started to think of reasons why I wasn't getting an airstart. There were two reasons. Number one—I wasn't getting any fuel. I discounted that one because below 10,000 feet the fuselage tanks feed by gravity. Number two—I wasn't getting any spark. I already had it figured out that probably my battery had gone dead on that first airstart—could have been an old, wornout battery. Then I thought, "Well, maybe the battery switch is off." I said, "No, the battery switch is on, because I remember turning it on back at Lima. Well, don't be so damn stupid," I said. "At least look at it!" I reached over and felt the switch—it was off. I turned it on. The radio came back on, the lights went on, and the instruments started bobbling around where they should have. Right then I felt like I was pretty close to God again. He had been away from me for awhile. When I tried my next airstart she fired up just as though nothing had ever happened — as though it was written in the book that way.



". . . all I could think of was my wife waiting for me . . ."

I was around 8,000 feet, so I rode it on down to 6,000 feet and got my RPM up enough and airspeed enough to get my throttle around the horn. My radio was now operating, so I immediately started calling in the clear for any D/F station that read me to give me a call on "D" channel. Sierra AFB answered me and said that they were reading me loud and clear. I told them to please notify all appropriate agencies that I had flamed out and that I had come all the way down through Green 5 from 35,000 feet to 6,000 feet with no radio contact. I also told them that I was going to climb back up to at least 25,000 feet, to an altitude consistent with good fuel usage. They said, "Stand by." They came back and said, "ARTC advises that you remain at 6,000 feet VFR. They have heavy traffic in that area." I called Sierra and said, "You can tell ARTC that I'm lost, I don't know exactly how much fuel I have left, and that I'm going up to 25,000 feet or higher to an altitude consistent with good fuel usage." They said, "Roger, stand by." So I stood by a little longer and they came back with, "ARTC insists that you remain at 6,000 feet VFR." I called back and said that I could not remain there and that I was going up to 25,000 feet. "I've declared an emergency and if they have other traffic in the area, have them get that other traffic cleared out." They said, "Roger, stand by." They finally came back and said, "ARTC clears you to 25,000 feet."

As I climbed up through 14,000 feet I gave Sierra my first tone for a steer. My heading to Sierra was about 201 degrees.

I had been pretty proud of my instrument flying prior to the flameout. I had been holding my heading within three to four degrees either

". . . We're OK. We can get you in fine. Come on down . . ."

side and my altitude to within 100 to 200 feet in bumpy weather at 35,000. I was really proud of it. After the flameout and after I had climbed to 25,000 feet, Sierra would occasionally call me and ask for my present altitude. I would say, "27,000 feet." They would call me about five minutes later and I'd say, "[illegible],000 feet." I couldn't hold it within 5,[illegible] feet of the desired altitude.

I called Sierra and asked them what their weather was down there. They came back and said they were OK, to come on down. I called them again and requested their weather once more. Sierra said, "We're OK. We can get you in fine. Come on down." I called a third time and Sierra said, "There's no sweat." I called again, and said, "I DEMAND the weather." Sierra said, "We have a 700 foot overcast with 100 foot scattered, visibility one mile with rain and fog." I immediately started a 180 and told them that I was sorry but I wasn't going down there, and started calling for any other D/F homer that could read me.

Samtown, South Carolina tower called me and said that Apple Valley D/F homer was reading me, but that they had a weak transmitter and I could not read them. There was a long distance telephone line open between Apple Valley and Leetown for this emergency and they would be glad to relay any steers from Apple Valley to me. Apple Valley's weather was 3,000 feet overcast. I transmitted for one minute for a steer. They came back with a heading of 110 degrees.

I called Sierra and told them that I was going to Apple Valley but would they please stand by for any D/F steers.

Echo Radio called and said, "I understand that you are having a little difficulty. Can we help you?"

"Roger," I said, "I have a heading of 201 degrees to Sierra and 110 degrees to Apple Valley. Get out your maps and rulers and tell me where I am and how far it is to Apple Valley." They called back in about two or three minutes and said that I was about 175 miles from Apple Valley. I looked at my fuel gages and had plenty. I had enough to mess around a bit, and that was fortunate. I kept

". . . I sat there for about fifteen minutes before I could get out of the cockpit . . ."

getting my steers from Apple Valley and some from Sierra, then I'd transmit them to Echo Radio and they'd spot me again.

I was again in the soup at 25,000 feet and I couldn't tune that radio compass. Here's another big error. I had no map of the Apple Valley area. I had run out of maps when I first started going back to Apple Valley. I had no Radio Facility Chart because I couldn't get it out of the map case. It was lodged between the East and West Handbooks and the Jet Letdown book. I even tore the cover off of the West Handbook trying to get it out. I had no way in the world of knowing the frequency of the range station at Apple Valley. By the time I was worrying about that, I was nearing Apple Valley, so I called them and asked them to give it to me. I had to ask them about four times before they were convinced I was in trouble. I tuned as close to the KC's as I could get. I flicked over to the compass position. I noted that the tune for max needle was deflecting when the station identification letters were sounding. I heard an "M" and a jumble of static, then a "P" so I figured I had the right station tuned in.

Echo Radio had me in pretty close to Apple Valley. The compass needle was reading about four or five degrees off my nose. When the needle swung to the full rear position, I called the tower and told them where I was and asked for the heading of the range leg where I was to make my letdown. They said for me to make a standard jet penetration. After calling them about two or three times I finally got out of them that they wanted me to letdown on the southeast leg on a heading of 140 degrees. I turned back in 180 degrees to the range station and hit it, tracked out for a minute or a minute and a half, and made a high-speed letdown at 325 miles per hour, made my jet penetration turn and started back in.

At an altitude of 3,000 ft. I figured to break out under the overcast. At 3,000 ft., however, I was still in the soup. I called for anybody who could read me and asked them to give me a call. Finally, Lima tower, up in Virginia, said they could read me, but weak. I was reading them fine and told them so, and asked for the minimum altitude and weather. They gave it to me; it was 3,000 ft. overcast with five miles visibility. I kept on at a 320 degree heading and broke out about 1100 ft. over the ground and called back to ask what the heading from the station to the field was.

'In a Sweat'

If I had not been in a sweat when they told me, it would have been no puzzle to me; but when they came back and said the heading from the range station to the field was 140 degrees I was lost—really lost. I nearly gave up again right there. I was now heading 320 degrees and I couldn't figure out why they wanted me to turn. I was just about to hit the panic button again when it occurred to me that the field was between me and the station. I drove on in beneath the ragged edge of the overcast until finally I saw the blinking light, the double white with the green on the back, flashing from the beacon at Apple Valley. I called, then switched over to "B" channel and said I had the field in sight.

In case you are wondering why I had the flame-out, here's the story. When I had reached down to the right for the pitot heat switch, I had hit the checkout switch instead. The sudden surge of fuel had drowned out my flame.

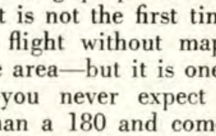
My inability to make an air start, of course, was due to the fact that my battery was not turned on.

I might add here—in case you are wondering about how I flew instruments on this flight—I loosened my shoulder straps so that I could lean forward over the stick. I guess I must have been about 3 inches from the instruments. While trying to read them, I was helped quite a bit by constant flashes of lightning. Every now and then a sheet of lightning would come just in time to help me get out of a tight spiral. My windshield plate glass was a solid sheet of "St. Elmo's" fire.

I have always carried a flashlight prior to this trip—I have been carrying one since 1942. This is the only time I have ever forgotten to turn on the battery switch; and it is the first time I have ever had a flame-out. It is the first time I have ever hit the checkout switch while in flight; and it is the first time I have ever hit it without being prepared for such a thing. It is not the first time I have made a flight without maps of the complete area—but it is one of those things—you never expect to make better than a 180 and come back to an area that you don't ordinarily hit. All the same, it was a mistake. I should at least have had a jet handbook.

As soon as I had discovered my flame-out, I should have made an immediate call to ARTC to let them know I was in an emergency. But it was one of those times when pride jumped in and said, "To hell with it. Don't let anyone know you have had a flame-out, particularly that you did it yourself. You can get back up before you reach 20,000 ft.—no sweat."

As you can see, each of these little details in themselves would not have placed me in serious trouble. It was the accumulation of all these things together that nearly ended my Air Force career. ●



UHF PANIC

THE stage was set for this accident two months before the curtain fell. In the last scene, two T-28's are piled up at the head of the runway, amid a cloud of dust. One of the airplanes had landed on top of the other while both were flaring out for a landing. Both student pilots escaped injury.

There is quite a bit of background material leading up to the final scene which is well-worth close scrutiny. Let's back up and look over the various acts which lend continuity to the plot.

ACT I

At a certain air base, a communications SOP was printed and distributed to all organizations. This directive established new UHF and VHF frequencies to be used during the course of flying training for advanced student pilots.

However, only six aircraft on the base had the new UHF frequencies installed at the time of this accident —*approximately 40 days later.*

ACT II

It was decided, by supervisory personnel, to use the new UHF channel assignments as published in the communications SOP. Without checking, it was assumed that all the UHF radios in the aircraft, tower and mobile control had been re-crystallized. The instructors and student pilots were instructed to use the newly assigned frequencies. Here's the payoff clue to the whole story:

An instructor pilot briefed his two students for a three-ship formation flight—the two students to fly positions two and three, respectively. They were further instructed to check in with the tower before takeoff on channel six, the channel to be used in the traffic pattern.

After starting the engines, the IP and two student pilots made ramp calls to the tower on channel six. Receiving no answer, they *assumed* that the tower and mobile control radios were temporarily out of commission. What they didn't know was that the tower, mobile control and *only six* other field aircraft had the new UHF frequencies. These three aircraft still had the old crystals installed.

Hearing each other loud and clear, the three airplanes took off and switched channels for a formation flight.

ACT III

The tower and mobile control, on channel six (new frequency), were receiving each other five square, but were unable to contact the three aircraft in question. They *assumed* that the aircraft radios were out of commission.

ACT IV

At the completion of the formation flight, the IP instructed his solo students to switch back to channel six for entry to the traffic pattern. The channel switch was made, and all three aircraft peeled off for the landing.

Number two peeled off after his leader. He dived excessively, however, and maintained an altitude below the briefed traffic altitude.

The third aircraft peeled off and the student pilot began his cockpit check for landing. He glanced down in the cockpit. Upon looking up, he saw two T-28's properly spaced ahead of him in the pattern. *Assuming* the airplane directly ahead of him to be number two, he bored in to close the spacing between them.

Unknown to the other pilots, number two was directly below the third aircraft. He was likewise intent on keeping traffic spacing ahead and did not see the aircraft directly over him.

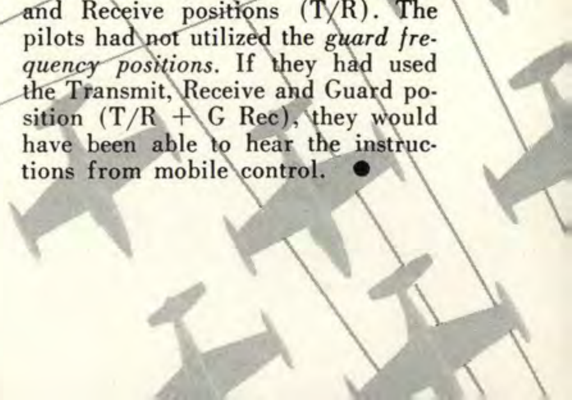
ACT V

Rounding the bend onto the base leg, the two T-28's were noticed by the mobile control officer. He switched radio channels several times, trying to contact the two aircraft. By this time, the T-28's were lined up on the final approach, one above the other. No flares were fired by mobile control because of the possibilities that both airplanes would heed the flares and collide during the go-around.

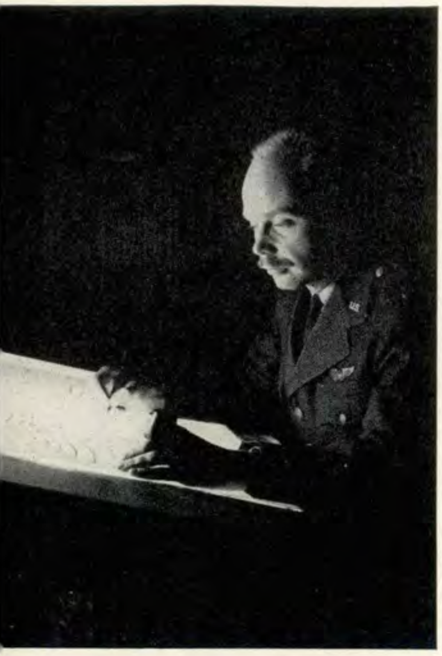
As number two flared out for landing, number three dropped on him from above. Both aircraft, interlocked, skidded to a stop. The student pilots evacuated the aircraft with great alacrity and dispatch, so to speak, with no injuries!

Curtain

After the investigation, it was noted that another contributing factor was the fact that the aircraft radios had been placed in the Transmit and Receive positions (T/R). The pilots had not utilized the *guard frequency positions.* If they had used the Transmit, Receive and Guard position (T/R + G Rec), they would have been able to hear the instructions from mobile control. ●



Through streamlined communications, Flight Service gets out the warning word to pilots.



The AWS weathermen forecast and keep track of all storms on a daily weather chart.

It's in the WIND

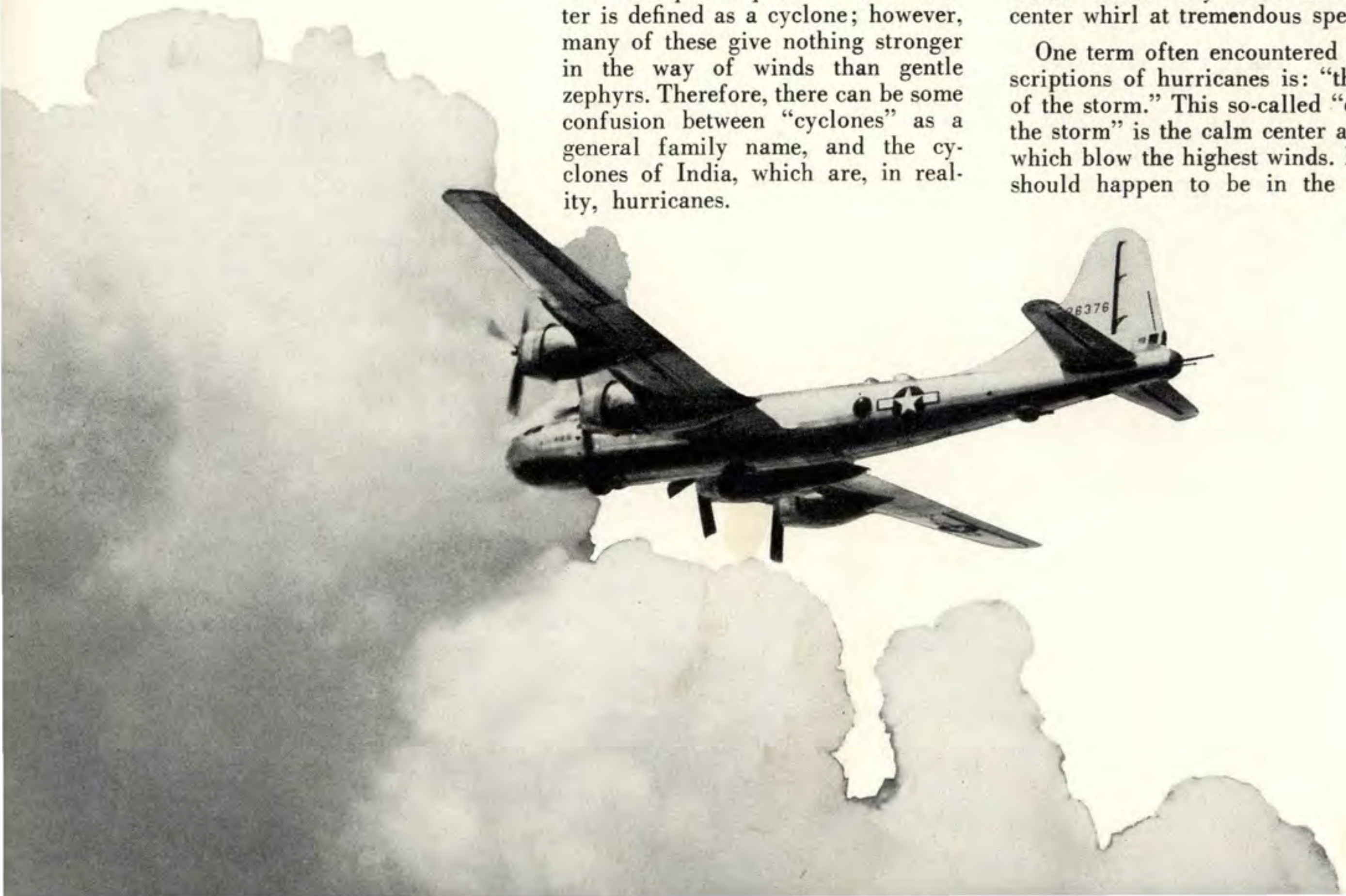
IN the beginning, we must recognize the fact that "a wind by any other name will blow as hard."

In the North Atlantic Ocean high winds are called hurricanes. In the western North Pacific Ocean, similar storms are known as typhoons, and both the Philippines and Japan are frequently visited by them. In the Bay of Bengal and in the northern Indian Ocean they are called cyclones. In Australia they are called "willy nillies." Incidentally, any weather system which has a region of low atmospheric pressure at its center is defined as a cyclone; however, many of these give nothing stronger in the way of winds than gentle zephyrs. Therefore, there can be some confusion between "cyclones" as a general family name, and the cyclones of India, which are, in reality, hurricanes.

Hurricanes are born in tropical regions, and in the north Atlantic their season is from May to December. Records of the past 400 years show that September is their favorite month, with October a close second.

Here is a brief description of the characteristics of a hurricane. At the outer fringe of the storm area, the winds are gusty, but less than 20 mph. As they move inward the speed increases gradually. Squalls are followed by furious gales and, finally, if the hurricane is a severe one, the winds immediately surrounding the center whirl at tremendous speeds.

One term often encountered in descriptions of hurricanes is: "the eye of the storm." This so-called "eye of the storm" is the calm center around which blow the highest winds. If you should happen to be in the direct



The broken cloud "floor" within the "eye" of a typhoon. The clouds show the circular motion of the storm.

Typical eye of a Pacific typhoon. Surface winds under the circular cloud formations range as high as 170 MPH.

path of the center of the storm, you would experience terrific winds as the center approached, then, at the "eye" there would be a sudden calm, but soon the winds would abruptly begin again, blowing with great violence from the opposite quarter. On the average the "eye" is about 14 miles across, but, of course, there are great variations from storm to storm.

As hurricanes occur only during certain seasons of the year, it might be thought that we would know exactly how they form. This is not the case. One difficulty is that hurricanes develop over the tropical oceans where there is a scarcity of reliable weather information. The very fact that they do develop in certain restricted regions does give us a clue. As they are born over the sea and usually disintegrate rapidly after moving inland, it would appear that they must have a large supply of water vapor available if they are going to amount to anything.

There is a certain broad pattern which many of them follow, but the forecaster can never be certain that any given storm will follow that pattern. Because a difference of position of only 50 miles can make the difference between terriffic destruction and only a heavy gale with minor damage, the importance of forecasting their future course as exactly as possible is readily apparent. It is little wonder, then, that each new hurricane adds a few more gray hairs on the forecaster's worried head. For example, a hurricane may behave admirably for two or three days, moving at a uniform 10 mph along a straight path; it may then gradually alter course, but still keep up its steady 10 mph gait. However, when it begins to shift course every few hours and changes its speed hourly, as has been the case all too often, well, some forecasters wish then that they had chosen a nice quiet profession like lion-taming!

During World War II, we introduced the method of christening the typhoons in the Pacific. Army and Navy meteorologists, who were stationed there, often referred to "60-mile-an-hour Mary" as approaching the Philippines at 11 knots, while "Pauline," a more violent member of the high wind family, was tearing along the typhoon track, working up winds of 90 mph speed near the central "eye" of the storm.

The meteorologists name hurricanes so that they may more readily keep track of several storms at one time. Lists of ladies' names, which might range from Agnes to Wilhelmina, are prepared in advance. When they run out of names, they prepare some more. If a typhoon originates west of the 180th meridian, the weathermen name it from a column which runs alphabetically from A to R, inclusive. They skip Q, partly because there are not too many names beginning with that letter, and also for some other technical reasons. If the storm starts on the North American side of the 180th meridian, it is christened from the list of names beginning S. T. V. or W. If a storm is named Victoria it started on this side of the International Date Line.

South of the Equator, the weathermen have another list—boys' names, this time: Alan, Bill, and the like. Due to the rotation of the earth the sexes never get together, since the females spin northwest away from the Equator; the Arthurs, the Dicks and the Harrys travel away from the Equator, too, but to the southward. Therefore, Typhoon Tessy and Hurricane Harry will never meet. ●

(Condensed from RCAF Roundel.)

Weathermen think gusts of hurricanes create air movements for intervals that may reach 250 mph.

These pictures show the human centrifuge machine in action. Above, a fully equipped pilot checks acceleration effects. At right, a pilot tests his reaction time and control movements while whirling in the USC centrifuge machine.

SCHOOL FOR FLYING

EARLY in 1953 the first class of 20 men will matriculate at the Air Force School for Flying Safety Officers. The school, located on the University of Southern California campus, will train pilots for duty as Flight Safety Officers through an advanced curriculum designed to raise these officers to a uniform professional level.

The University of Southern California was picked as being particularly suited for the school due to its proximity to many aircraft industries, experimental centers and to the Directorate of Flight Safety Research.

In preparing this material, questionnaires were sent to Flying Safety Officers asking what subjects they felt should be emphasized in the course. In addition, opinions were solicited from the Civil Aeronautics Administration, aircraft manufacturers flight safety divisions, the Flight Safety Foundation, the Cornell-Guggenheim Aviation Safety Center and the major Air Force commands. These opinions were coupled with those of experts in the various branches of the Directorate of Flight Safety Research in establishing the training syllabus.

All course material has been reviewed and approved both for con-

Campus buildings at USC, home of the FSO school. At left is famed Mudd Hall.

Flight Surgeon explains experiment to subject undergoing tests for reactions.

Above, this student is getting a careful check-out on the proper fitting of the oxygen mask.

SAFETY

text and presentation by the Directorate of Flight Safety Research and by the Air University.

Each class is six weeks long, and the subject matter is divided into the following categories of 50-minute instructional periods:

Orientation and registration — 2 periods; aeronautical engineering—72 periods; aviation physiology—18 periods; educational principles and methods—18 periods; aviation psychology—18 periods; accident prevention and administration of accident prevention programs—23 periods; accident investigation and reporting—44 periods; field trips—14 periods, and concluding exercises—1 period.

The aeronautical engineering course is being prepared by Prof. James B. Vernon and Prof. Victor J. Martin, both of whom are faculty members of the University of Southern California's school of aeronautical engineering as well as consulting engineers for the USAF Guided Missile Program.

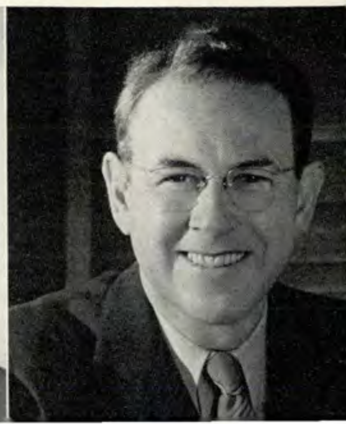
Subject material includes aerodynamic forces and how they effect or cause accidents; characteristics of modern, high performance aircraft such as compressibility, control reversals and strength of materials; stresses and how they can cause materiel failure; inspection methods; study of engines; breakdown of accident causes by component parts; methods used to determine typical failures and a complete rundown of all aircraft systems in their relation to accident causes.

Field trips are scheduled to a major aircraft industry to observe engineering methods and manufacturers flight safety programs.

Dr. Paul H. Evans, a former USAF flight surgeon, will teach the course in aviation physiology which will be primarily a study of the effects of the stresses imposed on the human

Faculty, L to R: Captain Smith Ames, Air Force liaison officer to the school; Cecil E. Davies, Accident Investigating; Dr. Louis Kaplan, Educational Methods; Dr. Neal D. Warren, Aviation Psychology. Successful procedures will be stressed.



Prof. James B. Vernon, USC faculty member, who served as consultant in establishing the engineering course.

Willis S. Duniway, lecturer on public relations and news media.

Dr. Milton C. Dickens will teach public speaking in the FSO school at USC.

Howard M. Palmer, editor of the USC Alumni Review, is scheduled to lecture on graphic presentation.

body during flight. The course is designed to demonstrate how heat and cold, G-forces, hypoxia, vertigo and fatigue all effect a pilot and can contribute to or cause an accident.

A training aid which will be used in the aviation physiology course is the human centrifuge machine. This centrifuge, one of five in the United States, is part of the lab equipment in the University of Southern California's aviation lab. It will be used for training students in the effects of acceleration. It can demonstrate the production of vertigo by head movements while undergoing G-forces; individual blackout levels; the degree of protection afforded by use of the anti-G suit, and how acceleration affects the pilot's ability to reach and use aircraft controls.

Educational principles and methods will be taught by Dr. Louis Kaplan, former Director of Teacher Education at the Oregon College of Education. A major part of this subject will be devoted to the best teaching methods to use when conducting a safety education program, and to those techniques which can be used to get active participation in the program.

Public Speaking

Another part of the education course is devoted to public speaking, taught by Dr. Milton C. Dickens, head of the Department of Speech at USC. Here the future FSO will learn to get his message across verbally in lectures, conferences or forums which are an integral part of the safety education program.

Another phase of the education course is the series of lectures on public relations by Mr. Willis S. Duniway, Chief of Publicity and Development at USC. Highlights include maintaining contacts and a sound relationship with local news media and civic organizations.

Mr. Howard M. Palmer, managing editor of the USC Alumni Review, will teach the principles and techniques of graphic presentation.

Aviation psychology instruction, by Dr. Neal D. Warren, former head of the University of Southern California's Psychology Department and at present Air Force and Navy consultant on psychological investigation, will demonstrate to the students the basic principles of human behavior which apply to safe flying. This course will review research findings of psychologists and how they can be applied to accident investigation and prevention.

Procedures Stressed

A course in organization and administration of an accident prevention program and one in accident investigation and reporting will be taught by Cecil E. Davies, a former Air Force pilot who was (until November, 1952) a member of the Directorate of Flight Safety Research. Examples of successful procedures now in use at wing and base level will be stressed in this study. Methods of investigation, use of the 62-5 handbook and study of the new 62-14 regulation governing investigations and reporting all are important parts of the curriculum.

Another major item will be learning to write accident reports in a uniform manner so that the material in AF Forms 14 will be more dependable for use statistically by such research agencies as the Directorate of Flight Safety Research in compiling accident causes and trends.

To be admitted to the school, a student must be a pilot on flying status, hold the rank of captain or above and meet the general requirements listed in the USAF Training Prospectus, pages A-3 and A-4.

Pilots with experience in Flight Safety (AFSC 1444), operations (AFSC 1435) or engineering (AFSC 4344) are preferred, though none of these AFSCs are mandatory. Upon graduation all students will be awarded an AFSC of 1444.

Since the inception of the flying safety program in the Air Force the need for education of Flying Safety Officers has been well recognized. The school offers an expanded career field, at a high professional level, to all officers fortunate enough to be selected for training in this vital work. ●

P + RO = *TEAM*

By 1st Lt. Stanley J. Grogan

EVER SINCE RADAR observers have guided night fighters to their targets, the back-seat driver has been "Johnny-on-the-spot" when the chips were down. With the advent of modern all-weather interceptors, his job is basically the same; however, high-speed aircraft have added a few new twists to his stock of all-weather fighter lore. Although an R/O's technical knowledge will differ for varying times and aircraft, the good observers of yesterday and today possess both characteristics and knowledge which can spell safety or danger, depending upon timely use of available information.

An intense desire to fly and a desire to learn all he can about his aircraft is a *must* to the observer who thinks himself conscious of the problem of flying safety. He must possess knowledge of every applicable field of aviation to the problems of all-weather flying. In part, this means the proficient observer should understand the functions of an Air Defense Control Center, a Ground Controlled Intercept station, and the functions of Ground Controlled Approach. These are major items, but the requirements of a mission will entail knowledge of many related fields sometimes not directly connected with actual all-weather flying.

An observer should be alert to any facts which can ultimately better his situation should an emergency arise. Furthermore, the efficient radar observer should be well-trained in various intercept techniques so that he can effectively intercept aircraft in any kind of weather. The observer should be able to correlate navigation and tactics in relation to his radar set.

To an "on-the-ball" observer sufficient knowledge, proper attitude and technical skill are second nature to his work. He realizes that little margin for error exists in all-weather flying, as the following case in point demonstrates: While returning from a weather reconnaissance mission with little fuel aboard the pilot asked his observer for the proper Rbn signal of a given station. The pilot then turned to the proper frequency and followed the Rbn in. Over station the pilot discovered that he was at the wrong place some fifty miles off course. He then tuned to the proper station but was forced to make a dead stick landing due to fuel starvation near his destination.

Sheer forgetfulness on the part of the R/O was the cause of this near-accident. The observer did not check on information available to him before giving it to his pilot.

On another occasion, an F-94 flying a night scramble after an unknown bogey from a JADF base recently was given the bogey's position by the ground controller: "Rambler Red, bogey now 11 o'clock, 12 miles." Rambler Red acknowledged the transmission. Shortly thereafter the A/W fighter closed on the bogey after the radar observer notified the pilot that they were on a collision course. Correction of the final flight path of the interceptor as a result of the radar observer's alertness meant one intercept successfully completed *without* the loss of two aircraft and personnel in the process. At the time of this particular intercept the height-range indicator used by a ground radar station was inoperative, thus making height estimation and radar observer skill essential to completion of the mission.

The foregoing examples are typical of what can happen in an all-weather fighter squadron under normal conditions of operation.

It should be remembered that indifference is the killer as far as radar observers are concerned. He provides information when the pilot does not have it available. He checks the pilot on his actions while in flight. He is insurance to the pilot, the mission and himself. He functions as a team with his pilot in keeping alive the concept of flying safety in all-weather fighter operations.

Some observers like to talk about tactics; others occupy their time with bull sessions on navigation while talking things over prior to takeoff or in de-briefings. Bull sessions are tops for exchanging information on all aspects of flying. No matter what the field, whether it be forecasting weather or latching on to a bogey—a thorough examination of applicable aspects of flying add up to one thing — flying safety — in all kinds of weather. ●

LANDING

THE statistics boys have come up with some interesting facts for 1951. While the USAF accident rate dropped materially last year, we still managed to come up with over 1000 major accidents that occurred on the final approach or upon landing.

A quick review of Accident Investigating Board findings shows that old bugaboo, pilot error, leading the field again. About 60 per cent of all accidents that happened either on final or after touchdown were directly attributable to some heads-up-and-locked stunt by a pilot who should have known better.

Going into the home stretch, pilot error is closely followed by materiel failure and maintenance error, which contribute another 30 per cent to the accident rate in this phase of operations.

Supervisory error and ground control mistakes are neck and neck for the number three spot, accounting for an additional five per cent.

Let's take a look at some examples of these completely unnecessary accidents and *you* judge who was responsible.

Shortly after takeoff, a C-47 pilot noticed his right engine backfiring and cutting out. After feathering the prop he turned back to the field declared an emergency, and set up his traffic pattern.

His copilot, a fighter pilot, had not been in this type of plane for almost a year and, unfortunately for all concerned, his crew chief was equally inexperienced. The pilot ordered the crew chief to lower the gear (a violation of AFR 60-15) on the base leg, under the copilot's supervision. He called for flaps on final but as the airspeed was high and the red warning lights indicated an unsafe gear condition the copilot held off lowering them. Finally, a single engine go-around was made and the pilot once more set up his pattern.

He again told the crew chief to drop the gear which in itself was a violation. The gear was lowered as follows: The landing gear latch lever was placed in the up position and the gear handle placed in the down position until 500-pound pressure was reached. The engineer then tried to put the latch lever in locked position but naturally he couldn't get it in, because of incorrect procedure. The red light stayed on and another go-around was attempted.

This time the pilot had trouble getting sufficient altitude and clipped the tops from trees at the end of the field. He finally staggered around, lined up, had the engineer go through the same procedure, and stalled in on the runway from ten feet up.

After rolling a short distance down the runway, the gear retracted and the aircraft ended up on its belly, incurring major damage. AFR 60-15 specifically states that only rated pilots will operate landing gear mechanisms. At no time did the pilot brief

Pieces fly high upon initial impact as this B-17 makes a gear up landing following the pilot's failure to use correct emergency gear procedure.

Famous last words: "I thought the crew chief was handling the gear."

The F-84 jockey who ended up in this embarrassing position forgot to check for "three down and in the green."

ACCIDENTS

the crew on any procedures. *You* decide who caused this one.

How would *you* decide on the tight bind this F-80 pilot got into recently? After turning on the base leg he got a gear warning light in the red. He closed his throttle to idle, instead of 50 per cent RPM as his squadron SOP called for, and put his head in the cockpit to reactivate the gear.

When he finally got around to looking for the runway he found he had overshot it and had to tighten his turn to get into the field. His airspeed fell off in the turn, but when he applied throttle to bring it up and to make the field, it failed to respond. He rolled out and dropped his nose, but the F-80 went into a skidding turn and stalled in 1200 feet short of the runway. Impact with the ground sheared his gear and the aircraft skidded and bounced 300 feet before coming to rest. The pilot was unhurt but the plane joined the scrap metal drive being conducted in the local area.

How about this one, involving not one, but two F-80's which received major damage while attempting to land. The two pilots arrived over their destination after an uneventful ferry trip and established normal patterns. They both decided to land on the extreme end of the runway, which was 5500 feet long, as the length was considered inadequate by them for this type of aircraft.

Unfortunately, there happened to be a four-foot embankment off the end of the runway. They both came in very low and slow, and, in turn, proceeded to hit it and damage their under-carriage. One plane knocked off the left gear and slid down the runway approximately 500 yards, ending up off the runway. The other plane had the right gear knocked back and up into the wing.

T-28 Accident

Next, we have an accident involving a T-28, an instructor and a student officer. It seems the instructor decided to demonstrate a practice GCA but contrary to his Group SOP and despite squadron briefings on GCA procedures he neglected to carry out two items on his checklist. One was to put his gear down, the other was failure to place his mixture control in "Rich."

He did inform the student that ordinarily the gear is lowered on the downwind leg while shooting GCA's but stated, "I won't bother, as I'm in a hurry." He needn't have been—this aircraft stayed at that particular field for quite a while.

The instructor testified that he carried between 10 and 12 inches of manifold pressure while gliding on the base and final but when he applied power at approximately 50 feet above the ground, the engine backfired and failed to respond. The final 50 feet were used up trying to apply power; no attempt was made to lower the gear. The T-28 was observed to make a three-point landing, sans gear, and come to a screeching halt. Who gets the black mark in *your* book on this one?

No landing accident article would be complete without a story about some fabulous character who, in a mental vacuum, fails to hear his gear warning horn blaring away in his ears and greases one in on the belly. We'll let the pilot relate what he did, in his own words.

"I cames into initial and pulled off according to the SOP for landing at this field. I cut the throttle and when my airpseed was 200 MPH I reached down for the gear handle—I thought it was the gear handle. I made a gear check and noticed the red light was on at the time and then made a cockpit check. I then tried to put down the flap handle and noticed it would go down only slightly. In the meantime, I noticed the red light was off. (Ed. Note: In F-47's the red light will go off if the gear handle is up and more than one-third throttle is used) and visually checked that the flaps were down. I advanced the throttle to hold speed and heard the tower give me a wheel check on base leg, which I acknowledged as gear down and locked. I continued on final

and didn't notice anything unusual until the prop hit the runway."

Of course, what this pilot did was to grab the flap handle instead of the gear handle and dump his flaps instead of his gear. Tests conducted immediately after the accident showed that the warning horn and lights were operative.

The usual wheels up damage resulted, but enough said. *You* be the judge.

Another fine example was the B-25 pilot who got caught out with his weather down. Returning from an extended cross-country late at night he was informed that his home base was socked in with ground fog; ceiling zero and visibility about one-quarter mile, well below night GCA minimums. He elected to give it a go, as he thought the fog might be spotty, but neglected to pull up when he reached GCA minimums.

Continuing on the approach till he saw lights, he rounded out and started to float. Abruptly changing his mind he poured the coal to the B-25 but not before the plane hit hard and swerved 30 degrees off the runway. He got the plane airborne and the gear came up okay but when he tried to lower it again, the right gear wouldn't go full down and lock. The pilot proceeded to another field that was clear and after exhausting all emergency procedures, landed with the right gear partially extended and unlocked. The B-25 rolled for three thousand feet before the right gear collapsed and the plane groundlooped 180 degrees to the right. Major damage was sustained; fortunately the crew escaped uninjured. Ask *yourself* whether this accident was avoidable and whose fault it was?

Other examples might include the copilot on a heavy bomber who pulled the gear up on landing roll in the belief he was getting the flaps, or the wingman who overran his flight leader after touchdown and clobbered two planes because he didn't want to go around.

In the second category, that of maintenance error and materiel failure, are several cases in which the pilot and crews are as blameless as they were guilty in the previous examples.

An F-51 had undergone extensive repair work and was test flown by the squadron maintenance officer. After 35 minutes of flight, the test pilot discovered that the left rudder pedal had fallen down and forward movement was impossible.

He was able to get some rudder control by attaching a wire to a pencil and lifting the left rudder pedal brake operating rod up from where it had fallen and jammed against the floor board structure. However, the rod slipped down again and this time jammed against the electrical connector plug forward of the floor board structure, giving him very limited rudder control.

Emergency Declared

The pilot called the tower and declared an emergency. He made a long final approach and touched down in three-point attitude on the end of the runway in what witnesses stated was an excellent landing. After landing, a slight turn to the right developed; there was insufficient rudder available to keep the plane straight and the pilot was forced to cut his switches when the turn tightened into a groundloop. The aircraft hit a snowbank alongside the runway, breaking the left landing strut and bending the flaps.

Subsequent investigation revealed that the bolt used to hold the brake pedal rod in place had not been installed properly. The bolt was found in the cockpit. Some character was evidently in too much of a hurry to bother safetying it in place. Result: substantial damage to an aircraft which only excellent pilot technique saved from being far greater.

Next, comes the B-26 which was forced to plow through field construction work because some maintenance man had improperly replaced the brakes after a write-up.

After a normal landing on a wet runway, the pilot applied brakes only to find that the right brake seemed to drag badly. Left brake was used to keep the plane straight but had no effect and the aircraft ran off the runway straight for the above-mentioned construction work. The grass was slippery and the airplane started to skid but sufficient power was applied to straighten it out and avoid the obstructions. The power carried the plane across another runway and into a soft sod area where the nosewheel sheared off, and the airplane slid some distance on its nose, causing major damage.

The left brake was found to be completely out of adjustment tolerances while the right brake had a tendency to drag. Some maintenance man's carelessness almost had fatal consequences. Do you chalk this one up to sheer waste?

Picture the plight of the C-119 pilot who had a runaway prop shortly after takeoff. He was unable to bring it back to normal and turned back to the field, still fully loaded. Though unable to maintain altitude, he had the field made and was 1000 feet out and about 150 feet above the ground when he ordered the gear lowered. The left main and nose gears came down, but the right gear remained in place. There was no time to use the emergency free-fall system and the plane was landed with one gear still up.

At about 60 MPH the plane veered off the runway and rolled onto the sod, damaging the gear, props and belly of the plane. Failure of the right gear actuating mechanism spoiled the excellent flying technique this pilot used in bringing his plane in safely under emergency conditions.

The failure of a bolt in the left landing gear of an F-82 changed a routine mission into near disaster and resulted in a major accident at an overseas base, recently.

Both the pilot and the observer had checked the gear warning lights in the green and touchdown was normal. Immediately after the landing, the left wing dropped and the plane swerved off the runway, tearing off the right gear, breaking the props and inflicting major damage to the wings and underside of the fuselage.

Investigation disclosed that when

the bolt failed, the gear was allowed to swing free. Upon contact with the ground, it broke off and the accident followed.

Supervisory Errors

Errors by supervisory and ground control personnel are the third greatest contributors to the landing accident total.

An example of control tower inefficiency is demonstrated in this account of a collision between a C-45 and a T-11.

The two aircraft were in the pattern shooting practice landings. They had taken off at a considerable interval but the C-45 was forced to make a large pattern to get spacing behind another aircraft. The pilot brought the downwind leg in however, and unknowingly spaced himself slightly above and forward of the T-11. The chief operator in the tower noticed them but made no attempt to get proper spacing in the tower.

While the planes were still on the downwind leg, the chief tower operator was relieved by his replacement from the next shift. He turned the mike over to his assistant and left immediately, without briefing the new man as to traffic or the identification of the planes in the pattern. (Ed. Note: Tower procedure states that the relief crew will be briefed for ten minutes by the old crew.) The planes were in a complete blind spot to each other and turned on the final in close proximity. The lower aircraft, the T-11, was gliding slightly faster than the C-45 and got into position almost directly under it. When the man at the mike finally noticed the two aircraft, he called the lower plane to pull up and go around. As the pilot started to apply power the C-45 settled down on the tail of the T-11, at approximately 50 feet above the ground, and both planes stalled and crashed, still joined together.

What makes the tower man's defection completely mystifying is that many witnesses at various locations on the field observed the two aircraft on the downwind leg and assumed they were flying formation. When the planes turned on the final, still in the same position, these witnesses stated that it was apparent that a crash was inevitable unless one plane was sent around. Luckily for the crews, some of the personnel headed for the approach end of the runway with fire extinguishers and arrived within seconds after the crash. Both planes were demolished and one caught fire, but the seriously injured crews were dragged to safety in time. Seemingly, the only people who failed to observe what was happening till it was too late were those in the tower.

The Accident Investigating Board fixed primary responsibility for the accident on the tower personnel for failing to observe two aircraft in close proximity to each other in the pattern and for failing to brief the incoming crew.

A flight of four F-86's was cleared to its destination with weather forecast to be 25,000 feet overcast, 5000 feet broken. The leader called in before letdown, asking for the latest weather as he observed thunderstorms in the area. He was given the same weather sequence and cleared for letdown to field. Arriving over the station the flight flew into a severe thunderstorm with greatly reduced ceiling and visibility.

In the meantime the base weather office had made several attempts to inform the control tower that weather conditions had deteriorated rapidly in the last twenty minutes. The information was relayed over the squawk box but before it could be completed, the tower informed the weatherman to wait, they were busy.

Once again the flight leader called in to the tower, stating they were in the area, at low altitude and were having trouble finding the field due to poor visibility. By now, it was raining hard at the station but they were given the same old weather sequence. In the meantime, during letdown, one plane became separated from the flight and went into a nearby field where the weather was okay. By the time the other three found the field at their destination they had insufficient fuel to go elsewhere, and set up a pattern to land.

The first two jets got down safely but as the third turned on final the forward visibility in the rain dropped to zero and he lost sight of the runway. He followed his gyro heading till over the edge of the field but touched down in a crab and skidded on the wet runway. The left gear tore off and the aircraft slid in on the wing, damaging the flaps and buckling the wing fairing and skin near the fuselage as well as the belly.

The finding of the Board was that the accident was caused because of supervisory error on the part of base operations, in that the procedure for relaying special weather observations to the control tower was inadequate.

All of the above accidents, except those involving the materiel failure, and a great majority of the over 1000 landing accidents the United States Air Force had in 1951 could have been avoided if someone had used his head or had been more careful. Each major command, numbered Air Force and individual base, by instituting a program aimed at preventing approach and landing accidents, can give the present accident rate a substantial kick in the pants.

What are *you* doing about it? ●

Failure to make sure the gear was locked down put this transport out of action at a time when it was badly needed for cargo operations.

Going direct?

. . . Fly One Heading!

By Capt. John C. Neill

DID you ever hear of a "Geostrophic Wind Scale?" If you have, the Air Weather Service is looking for you if they haven't already found you. Furthermore, if you have—forget it 'cause I don't know what it is and probably couldn't explain if I did. Don't stop reading now! I go under the theory that if a guy talks long enough, he is bound to say something sooner or later.

You know, I used to think weather forecasters were all a bunch of pessimistic die-hards. They just draw a bunch of red, blue, and purple lines all over maps and talk about mixing ratios, isogonic and isotherm lines just to impress or confuse you. I don't let that bother me, no sir-ee! I just pull out that green card when I start toward the Ouija — I mean weather office. Boy, that thing gives you about as much prestige in a weather office as it does in a good hailstorm.

Well, the other day while I was waiting to get some jet-juice, I decided to stroll through and see what evil winds they had brewed between Moody and Chicago. Would you believe it: one of those astrolog—I mean forecasters, had the nerve to ask if he could help me, and all the time I had that green ticket in plain view. Now of course I looked around to see if any of my friends were watching before I answered him. You don't think I want to be a disgrace to the Clan of the Green, do you?

Ready to Go

Finally, I told him that I was just about ready to saddle a hot pipe for the "Windy City" and wondered what kind of breeze was blowing around 40,000. Naturally, he went over to the winds aloft chart but they were blank, as usual. Immediately, I put on my best ironic smile and was about to tell him that it really didn't matter when he walked over to another chart and motioned me to follow. That suited me fine: "The more rope you give him, the higher he will hang himself."

He took the chart off the board and placed it on top of a table. Now, this was OK by me, but then he started getting personal. He asked me what altitude, route and airspeed I was going to fly. I guess I should have turned all eight loose on him at once but I managed to control myself. I finally calmed down enough to tell him in a rather cryptic tone that I was going at 420 knots TAS, 40,000 feet and direct Montgomery, direct Chicago—anybody knows a jet jockey goes direct and does not have time to bother with airways or ADIZ zones.

By the time I had lit a cigarette, blown a couple of smoke rings, and turned to see what he had done with the chart, he started giving me the word just like he knew what it was like flying a "squirt job" at 40,000. He told me to climb on course and fly directly over Maxwell Radio. From Maxwell Radio, he told me to hold 17 degrees of left drift correction and it would put me over O'Hare Airport at Chicago.

Now, I know that putting out this kind of info isn't SOP with forecasters, but this man seemed anxious to prove something to me, so I decided to go along with the gag.

I started a fire in the flues and pointing its nose down the runway, I gave throttle. It did not seem like any time had passed before I was at 40,000 and turning over Maxwell. Now the heading from Maxwell to Chicago is about 353 degrees so I held 336 just like the man said.

I knew that I was supposed to go just to the left of Nashville, and just to the right of Terre Haute. Well, I was to the left of Nashville but when I reached Terre Haute, I went to the left of it. When this happened, I knew I had one each weather forecaster dead to rights; however, I decided that I would continue and get a good case against him. You know what? I should have quit while I was ahead. When I turned the "Bird Dog" to the homing beacon located at the outer marker at O'Hare, the needle pointed off to the right about three degrees. About two minutes before I crossed the facility, that needle had moved over until it was pointing straight ahead, i.e., I passed right over the station just like he said I would.

Quite a Blow

Believe me, that was quite a blow to morale and it started me to thinking. The weather officer had computed my drift for me so quickly that I had missed the entire operation while lighting a cigarette. Maybe he had something which might even be useful to a "red-faced" jet pilot. At least, it would not hurt to ask about his system.

I did just that when I returned and what I found out was startling! In the first place, I found out that the weather man who had figured out my drift correction was a full-fledged jet pilot as well as a weather officer. Furthermore, he did a tour of combat with the 51st Fighter Group in the Korean fracas. At the same time, he was flying weather reconnaissance and forecasting where they were playing for keeps. He happened to be Major Leon M. Grisham, who is now Assistant Director of Academics, 3550th Training Group, Moody AFB, Georgia. This group consists of the USAF Instrument Pilot School; the Instrument Phase, USAF Aircrew School (Interceptor) and the Jet Transition School.

While I was trying to figure out whether he was a jet jockey that had slipped or a weather man that had been upgraded, he was explaining how he had computed my drift correction—in fact, he explained the process before I knew what was going on. As a result, he had to explain it again! Well, the thing was so simple that I had a hard time understanding it. Nevertheless, I am going to try to tell you how it is done, so here goes!

Somewhere during your checkered career you have probably heard rumor of a relation between wind speed and pressure. Well, it's true. Give a crystal ball gazer several pressure readings and he'll slap them into that "Geostrophic Wind Equation" that we glossed over but lightly at the beginning of this thing and out comes the wind speed.

OK—so you're convinced. But did you know that you too can diddle with this "Geostrophic Wind" thing? The AN5834-1 Dead Reckoning Computer (E-6D to you) has a scale based on this formula.

Here's how it works. Once you have decided where you are going and at what altitude, ask the forecaster for the *height of the pressure surface* at your flight altitude over the point where you will reach altitude and over destination. Give him a rough guess at the times you expect to be over these two points and he can crank out some pretty accurate figures. Then you can compute the difference in height (subtract one from another, sorehead) and set up the problem on the E-6D thusly:

On the computer face, set difference in *pressure height*—on the miles scale over distance in nautical miles —on the minutes scale between the two points.

Now, chase around the computer until you find a scale marked *latitude*. Find it? OK — read out from the average latitude of your flight to find the crosswind on the *miles* scale.

Figure 1: Here is E6-D setup to get crosswind component of 126 knots.

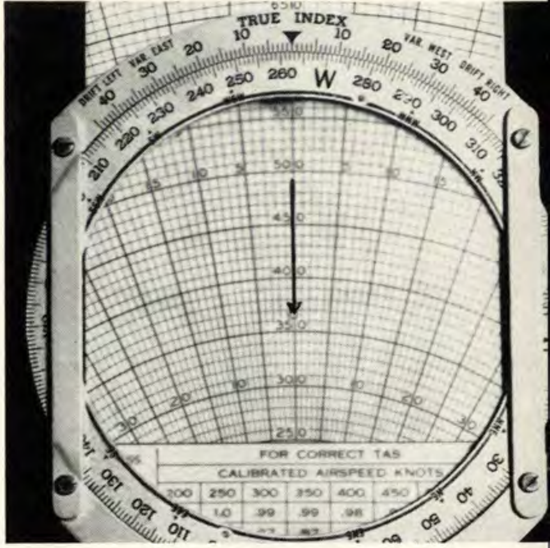


Figure 2: This is the way you convert the crosswind to obtain the drift angle.

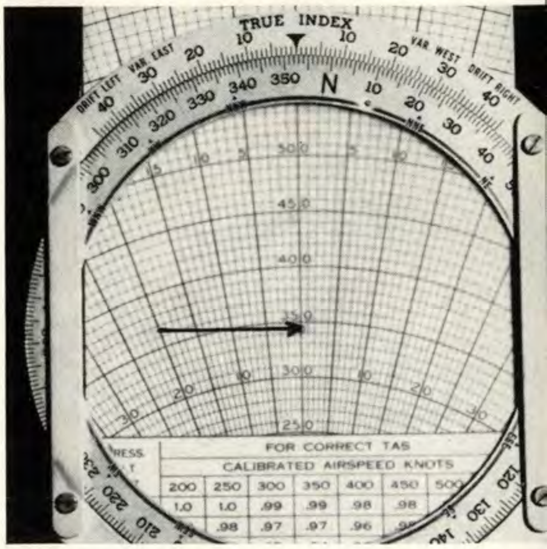


Figure 3: Now you read the single drift angle at tip of the wind vector.

GOING DIRECT . . . *continued*

That's it! That's all there is! You now have crosswind in knots. Slap it on your computer at 90 degrees to your true course, turn the compass rose 90°, put the tip of the wind arrow on your true airspeed by moving the slide upward, and read off the drift angle—the one, single drift angle for the entire flight at altitude.

For the hotter stove pipe drivers who are completely buffaloed by the wind face side of a computer, we have an even simpler method to arrive at this single drift angle. Just place your TAS in knots (minutes scale) opposite your crosswind velocity in knots (miles scale). The black rate arrow points to your single drift angle. If you don't believe it, then try it.

Don't run away until I give you a few ifs, ands and buts.

- It is accurate only for that portion of your flight at cruising altitudes.
- You have computed a net motion of the air mass perpendicular to your flight path—that means you have *crosswind only* and crosswind can *never be used to get ground speed.*
- Don't forget, this crosswind is in *knots* while your TAS is probably in MPH.

How about running through that sample flight? We flew from Moody Air Force Base to Chicago by way of Maxwell. Flight altitude 38,000 feet and TAS roughly 420 statute. We were at 38,000 feet prior to reaching Maxwell, so we will compute our single drift from Maxwell to Chicago. The first thing we do is ask the weather people for the heights of the pressure level over Maxwell and Chicago at the approximate arrival times. The forecaster gives us 39,420 and 37,360 feet MSL, respectively. To find the difference in height, we subtract algebraically departure from destination (Maxwell height from Chicago height), which gives us 2060 feet. This being a negative value means drift correction will be left. If it were a positive value, drift correction would be right.

Our basic flight planning consists of obtaining Flight Charts #187 and #229 and drawing a straight line on them from Moody to Maxwell, then another straight line from Maxwell to O'Hare. To get data for our flight between Maxwell and O'Hare (1) we measure the distance, 580 N. miles, (2) we carefully measure the true course at the midpoint, 353°, (3) we find the average magnetic variation, 3°E, and (4) finally we noted the average latitude to be 37°.

Now what have we: TAS 420 MPH or 365 Knots (D_2-D_1) Difference in height—2060 feet, Difference in N. miles 580, Average Latitude 37°N. Drift Correction—Left, Average Variation—3°E, True Course—353°.

Now for the Computer: Place 2060 on the miles scale opposite 580 on the minutes scale. Opposite 37° on the latitude scale, we then read 126 on the miles scale. (See Fig. No. 1) This is the crosswind component: 126 Knots. All you have to do now is convert this crosswind to drift. Place the crosswind on the vector face from a direction of 90 degrees to the true course of 353 degrees (263°). (Fig. 2) Now rotate the compass rose 90° to the *left* (Back to 353°) and move the slide upward until the tip of the wind arrow is on your TAS of 365 Knots. Now you read your single drift angle at the tip of the wind vector to be 20 degrees (Fig. 3).

Another method to obtain this drift angle is to place your crosswind component of 126 knots on the miles scale opposite to your TAS, 365 Knots, on the minute scale and the black rate arrow points to your drift of 20 degrees.

$$TC \pm W = TH \pm V = MH$$
$$353° - 20° = 333° - 3° = 330°$$

That's the story. Over Maxwell, turn on course to Chicago, crank in −20 degrees drift correction and hold it until you split the cone at Chicago. You'll save time and fuel because what you are actually doing is flying a pressure pattern.

If you use single drift corrections to obtain single magnetic heading flights, there are three precautions to be observed: (1) if the difference in the magnetic variation at the beginning and end of your course is more than 6 degrees, the flight should be broken down into several magnetic headings to prevent you from getting too far from the pressure pattern flight path you have calculated (this is especially true on East-West flights), (2) you should get the weather forecaster to give you an accurate forecast on your effective headwinds or tailwinds so you can estimate your ground speed (check this during flight) and (3) your *Slave gyro MUST* be accurate. ●

HIGH

DESPITE the advances made by modern science, no one has been able to disprove the ancient geometric rule that the shortest distance between two points is a straight line.

For many years, however, long range flying in the Northern Hemisphere was accomplished without reference to this "straight line" theory, even though it is now basically evident that tremendous savings in flying hours can be made by using certain routes over the Polar regions.

Any navigator can show you that in traveling from Seattle to Berlin, 825 miles would be saved if the trip was made direct, rather than via Gander, Newfoundland. Flying from Boston to Korea direct is 800 miles shorter than by way of Seattle. The route from Moscow to Seattle is 1400 miles shorter direct, than by way of Gander.

In general, there are compensating factors, which, when combined with modern equipment, make arctic navigation fairly routine.

Stable Weather

First of all, the weather is relatively stable, which is brought about by low surface temperatures. If adverse weather does exist, it is usually concentrated near the ground in the form of fog or stratus clouds. It is easy to climb into the clear air and fly over the unfavorable weather.

Landing an airplane in the arctic is another story. If a landing must be made, the same weather condition makes the operation much more hazardous than is the case at lower latitude airports.

Even when the weather is good, moderate winds will raise clouds of fine, dry snow into the air, and an increase in wind velocity may result in a change from CAVU to zero-zero in a matter of minutes.

Radio facilities in the arctic are few and far between, and often are unreliable as navigation aids. Radio blackouts and the aurora borealis (an electrical disturbance, known for its beauty and also for lousing up radios) happen unpredictably and may last for days.

LATITUDE NAVIGATION

Transmission and reception may be limited to 100 miles during such periods. Weather information is unobtainable, and in the event of a change of flight plan, or emergency, notification often cannot be radioed to the base.

At last report, the famed "Iron Beam" hadn't made its way this far north, so the old standby of pilotage navigation is missing. Mountains and other landmarks are almost non-existent. In the region near the North Magnetic Pole, it is difficult to distinguish between land and sea, since the land is low and the sea frozen over.

The arctic navigator is compelled to rely on celestial observations as his primary means of navigation and of determining headings. To make things doubly difficult, the sun often stays out of sight for months. At other times of the year, the prolonged arctic twilight has been known to make the sky so bright that the stars are invisible to the naked eye.

Everything isn't against the navigator, however, for when it gets dark in the area, it really is black. If the northern lights aren't out on any particular night, the stars and planets shine with great brilliancy in the clear atmosphere.

Other Problems

Another difficulty peculiar to arctic flying is the utilization of proper charts and maps. Most of the methods of reducing the earth's surface to a plane projection have been those which have proved serviceable in more habitable areas. For example, the Mercator projection, which gives a good map of the earth at the equator, is not practicable at high latitudes. In addition, the Mercator projection shows the meridians of longitude as straight, parallel lines, but, in actuality, they converge to a point at each pole.

Other factors to be considered in polar maps include constant scale, coverage of a large area of the earth, and straight-line representation of meridians and great circles.

In lower latitudes, headings are ordinarily given either in true direction or magnetic direction. This system fails in the arctic because the operation is so close to the geographic pole that the true headings on a great circle course change very rapidly. This has led to a new system of direction indication called the "Grid Heading System."

Shown here is the new Sperry high-latitude navigation gyro.

This system uses the Greenwich meridian as a reference line for grid-north heading. The heading is determined by the angle between this line and the desired track. Using Grid Heading, a great circle course can be maintained by making very slight alterations of heading as the flight progresses.

Determining heading is all-important in any kind of navigation. The North Magnetic Pole is approximately 1,175 miles south of the North Geographic Pole, and the magnetic compass becomes less and less reliable as the magnetic pole is approached.

This lack of reliability is due to many factors. First, the magnetic compass operates on the horizontal component of the earth's magnetic field, and this strength reduces until it becomes zero over the magnetic pole. Secondly, errors due to magnetism in an aircraft are accentuated. Third, slight accelerations of an aircraft cause a compass to oscillate wildly, because of the strong vertical component of the earth's magnetism. Finally, in order to determine true headings, a navigator has to know his position more accurately to apply the proper compass correction.

Continuous Checks

A navigator also faces another problem, for he is obliged to continually check his heading. Since the magnetic compass is unreliable in the far north, the only means of determining heading is a directionl gyro which is checked occasionally against the heading of the plane, as this is determined by celestial navigation.

One polar navigator, in relating his experience on an arctic experimental flight, says, "The magnetic compass on our own plane which at lower latitudes had been carefully compensated and had a probable error of approximately one degree, indicated approximately 30 degrees as we were flying directly towards the North Pole (Magnetic). The air was dead smooth, and the slightest turn of the airplane caused a wild swing, after which the compass would lazily settle back to 30 degrees instead of the correct reading of Zero degrees. After we had gone past the North Magnetic Pole, the reading was 90 degrees when it should have been South."

The current practice is to check the heading every 20 minutes and, by plotting these headings as given by the directional gyro, arrive at a fairly accurate determination of actual track. ●

The navigator of this SB-17 plays a key role in guiding the flight across arctic wastes.

Cross Feed

flying safety idea exchange

Survival Signals

Reading the October issue of FLYING SAFETY and noting the stress placed on survival and the ground-air emergency code, or use thereof, brings to mind an actual experience.

Signals are good, naturally, and the briefer the better. However, a crash or jump survivor can—with practically any kind of material available—almost write out in large abbreviated letters any type of emergency message, if time and physical condition permit. Considering that ground signals, and particularly those made from a representative code, are difficult to decipher from a moving aircraft (rescue outfits probably know this), I think the stress and practice should be directed on how to read and/or identify these signals, as the following story will, I hope, bear out:

I crash-landed September, 1951, in the heavy Alaskan timber country in a B-17 with six other crewmen. Luckily, the weather was clear and warm.

The plane ended up a mass of burned wreckage from which we salvaged absolutely no survival equipment other than our parachutes and a Boy Scout knife which the engineer was fortunate enough to have on his person. There was one fatality, and four serious casualties ranging from cuts, bruises and burns, to broken bones.

Using the engineer's knife, we cut up the parachutes to bandage the injured, and the orange panels were cut out and used for ground-air signals. Each panel was at least six feet long and two feet wide. These panels were laid out in two small open areas; one by the aircraft wreckage, and the other about 50 yards north, on top of high grass, in a small clearing. I had a reduced wallet-sized card of the emergency code taken from a Form 1 which I followed to make sure the panels were laid out properly to signal our particular need. One panel requested medical personnel and two panels requested medical supplies.

Our good fortune continued, and we were found in about four hours. Almost immediately there was quite a gathering of aircraft—rescue and otherwise—overhead. They flew quite low and we could easily distinguish faces peering at us from windows and blisters as the planes circled.

"Any Luck, Men?"

Three of us were able to move about, so we stood in the clearing made by the wrecked aircraft, holding up another large parachute panel. One whole chute was spread out on the ground near us, mainly for identification purposes. We did not jump around and wave our arms. Perhaps this was a mistake on our part but we did not want them to think we were OK. Apparently the light colored flying suits we wore blended in with the wooded terrain, as the rescuers stated later that they were unable to spot us.

Finally, one plane dropped two paramedics to definitely determine the possibility of survivors. After a land investigation, the medics also put out panels. Approximately 30 minutes later, a note was dropped asking "if there were any survivors!" I repeat—the weather was very good and the aircrews involved were from well trained rescue outfits, and the *only* airborne people who were able to identify us or our panels were two helicopter pilots, and they stated that they did not know what the panels requested.

Now, with more time we could have put out better identification than mentioned; also conditions could have been better for the rescue aircraft, such as signals tramped out in the snow and filled with brush, etc.—but then no crash or survival condition is ever ideal for rescuers or the rescued; Mother Nature does not always provide terrain or other areas for ideal signalling.

Again, I emphasize we could have made better and more identification signals with time and materials at hand. The only thing is that we—and most survivors — need a particular type of aid as quickly as possible. Therefore a code system is a "must," and I would like to stress that it is more important to be able to read and identify these signals from the air than it is for the survivors to be able to identify or know them for display purposes.

Capt. Michael A. Kelley
Eglin AFB, Fla.

Flying Safety Meetings

A recent conference by instructor pilots conducting transition, standardization and instrument checks at this base provided conclusive evidence that pilot discussions of C-47 accident *causes and results* at weekly Flying Safety meetings will promote sufficient incentive on the part of pilots to create a "volunteer" improvement campaign. Confronted with grim facts, it is our opinion that pilots (several hundred attached to our organization for flying proficiency flights) will readily grasp an opportunity to improve their procedures, thus reducing the glaring "human error" percentage of accident statistics.

In addition to the personal challenge presented to the pilots, it was further concluded that our standardization procedures, as currently being taught, can be improved, again promoting safer and more efficient flying activities.

Despite the fact that the C-47 is the most *forgiving* of all aircraft, accident statistics indicate that it nevertheless occasionally succumbs to the antics of pilots exhibiting unusually high degrees of negligence.

If at all possible, we would like for your office to forward complete statistics, reports and reviews which constitute, in your opinion, information that if properly presented at our meetings will improve sufficiently pilot techniques so as to justify both your effort . . . and mine.

Capt. Monroe D. Zartman
Hq 60th ABGp, Base Ops
APO 57, USAF

How to Say "Coca"

Among the problems arising from initial use of the new ICAO phonetic alphabet is the mispronunciation of COCA which replaced CHARLIE. Also involved is the matter of different shrubbery since the word often heard during in-flight radio conversation, COCOA (ko'ko) is associated with the seeds of the cacao or coco tree or the beverage made from same, while the ICAO word COCA comes from another shrub leaf, the source of cocaine. So, in the sense that QUEBEC is to be pronounced (ka'-bek), COCA should be spoken as (ko'ka).

Capt. Robert H. Hodges
Weather Det. 19-10, 19th WSq
35th AD, Dobbins AFB, Ga.

WELL DONE!

M/Sgt Charles F. Hilt, a maintenance inspector assigned to the 67th Tactical Reconn Wing in Korea, was making a T-33 flight to Japan with Lt. R. W. McDuff for the purpose of picking up jet replacement parts.

After passing the channel between Korea and Japan, Lt. McDuff asked Hilt to hold the stick for a minute while he (the pilot) worked out a navigational problem.

After holding the stick for a few minutes, Hilt noticed McDuff's head nodding forward, not knowing that the pilot had passed out from lack of oxygen due to a faulty oxygen mask. Hilt called McDuff on the interphone several times, and not receiving an answer, finally realized that the pilot was in trouble. Hilt turned the T-33 around, as by this time, they had passed the Japanese coastline, and at 37,000 feet the T-33 flamed out. Hilt managed to keep the airplane on an even keel until it had reached an altitude of 13,000 feet. At this altitude the pilot regained consciousness, and took over the controls, although he was unable to read the instruments for a few minutes. Hilt called off the readings for the pilot until his full vision returned, and the pilot then landed at Itami Air Base, Japan, after making an airstart at 6000 feet.

Keep Current

NEWS AND VIEWS

• **Drag Chutes**—Parachutes blossoming from the tails of B-52's and B-47's continue to draw attention these days as the big swept-wing bombers land after test flights. But the big item, not apparent to the casual observer, is the saving on brakes and tires brought about by the use of ballooning drag 'chutes.

It was pointed out by test pilots that the use of a drag 'chute roughly doubles the life of the main tires on a B-47, and of course, lengthens brake life. Drag 'chutes are also safety devices for short field landings, and for landing on slippery runways, especially under icy conditions where brakes are ineffective.

• • •

Captain Daniel J. Miller, jet pilot instructor, receives the 1951 Cheney Aviation Award.

• **Robot Boat**—First tests have been conducted on a new robot lifeboat to be used in rescuing survivors at sea. The radio-controlled craft is released by parachute and during the descent, the radio operator of the aircraft releases stabilizers on the boat by remote control, insuring a right-side-up landing. On contact with the water, the parachute is jettisoned, and a sea anchor is thrown out which holds the boat until the radio operator, still by remote control, can free the rudder guard, start the motor, and release the sea anchor. The 30-foot boat can then be directed to survivors by the radio operator.

• • •

• **Lieutenant General Robert W. Harper,** Commanding General, Air Training Command, presents the 1951 Cheney Aviation Award to Captain Daniel J. Miller, presently a jet pilot instructor at Williams Air Force Base, Arizona. The award was made to Captain Miller for his courageous rescue of six American infantrymen, wounded and trapped six miles behind enemy lines. Captain Miller is a native of Stony Point, New York.

The Cheney Award was established in memory of Lt. William H. Cheney, of the Air Service, who died in a crash at Foggia, Italy, in 1928. The award is made annually for an act of valor, extreme fortitude or self-sacrifice in the interest of humanity in aviation. Standards are high. Awards were not made for several years. No event, in those years, was considered worthy.

Roster of Award Winners

The history of the Cheney Award for the past 18 years is a roster of heroes. Lt. Robert K. Giovannoli, Air Corps, won the award for 1935. In 1936, Major Frederick D. Lynch, Air Corps, was awarded the Cheney Award. There were no awards made for the years 1937 or 1938 because it was decided no acts met the standards. The Cheney Award was made again in 1939 to Lt. Harold L. Neeley, Air Corps. The years 1940-1945 went without presentation of the award. Sgt. Lawrence Lambert won it in 1946. Again in 1947, no award was made. Lt. Gail S. Halverson won it in 1948. A posthumous award was made to Captain William E. Blair in 1949. Another posthumous award to Sgt. Paul P. Ramoneda was made in 1950.

Captain Miller, now a jet instructor at ATRC's Williams AFB, Ariz., joined the roster of heroes with the 1951 award.

SMOOTH SAILING . . .

LIES AHEAD for pilots who take maximum advantage of M. I. T. time in 1953.

You can go out and bore holes in the atmosphere for 100 hours and theoretically be proficient; or you can set up a routine for yourself that will really keep you sharp.

Every time you fly, make the most of it. Don't just wallow from Point A to Point B in an unerring straight line. Make it habit to work a range problem, an ILAS, a GCA or a DR problem each time you're out for that pay-time. Live AFR 60-2 by the spirit rather than the letter.

BE SHARP . . . STAY SHARP . . .
MAKE EVERY MINUTE IN THE AIR COUNT!

Esther Williams

1953

MARKS the fiftieth anniversary of powered flight, when Orville Wright rose several feet off the ground in his crude prototype and hovered triumphantly for all of twelve seconds. At this moment, Man's dream of the conquest of the air became an accomplished fact.

In today's high performance airplane, Man can cover quite a piece of ground in twelve seconds, and altitudes into the tropopause are common talk in aeronautical laboratories.

But with this progress we have inherited many corollaries that come with advancement. Today, the pilot must be not only skilled in the flying of his machine but *more* than familiar with the mechanical designs and characteristics of the machine itself.

In the development of today's high performance airplanes, the principles of safety in flight have never been more important, when Man stands on a new threshold, gazing beyond the barrier of sound, and possibly beyond the barrier of weight.

if you like to fly—live to fly through

FLYING SAFETY

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