flying SAFETY

Trouble in Threes

Avoiding the Crunch

Tied and True Tiedowns

How to Keep the Spark in Your Flying

JULY 1992

RECREATIONAL FLYING

THERE I WAS

■ I was one of two command pilots with a combined total of over 10,000 hours in a variety of Air Force aircraft streaking through the heartland of America in a Cessna 182 Skylane. A careful check of en route weather had been made, and we were assured by our faithful FAA briefer that once we passed between two rather large thunderstorm cells (plenty of distance between the two) near our point of departure, our trip home would be trouble-free.

Because of the possibilities of imbedded thunderstorms and a lack of weather radar on our trusty bird, we decided to remain in visual conditions, or if VFR could not be maintained, to return and wait for better weather. (Pretty good plan, don't you think?)

We were not far from our departure airport, enjoying fairly good visibility, when we started to encounter rainshowers. They were light at first, but got heavier, and it was soon apparent it was time to go to Plan B (return to point of origin). However, that nice little VFR corridor we had flown through was nowhere to be seen once we had done a 180° turn. No sweat. We just called approach (who we had been talking to for traffic advisories) and filed an IFR clearance, requesting vectors to our departure field.

Though I'm a little nervous (haven't much recent real instrument time in the last several years, thanks to a couple of staff tours), it's good to be in the protective custody of ATC. On vectors for an ILS, rainshowers are getting heavier, and it is getting darker — having a hard time maintaining altitude, thanks to terrific updrafts. Rain is now so hard it is coming through the door seals. It's very dark, with occasional flashes of lightning. The rain is deafening, and there is turbulence.

"Approach, no longer interested in the ILS. How about just vectoring us out of this weather and towards another airport that has an instrument approach." After a few more anxious minutes, we were vectored out of the intense weather and landed safely at a nearby airfield. It wasn't where we wanted to go, but it was nice to be somewhere!

After I regained my composure (about 2 days later), and since that time, I have pondered those "moments of terror" (out of a generally very pleasant USAF flying career). What are the lessons learned, and what can I do to avoid similar occurrences in the future? First is a healthier respect for possible severe weather and the value of getting weather information from all possible sources. (There was a military weather station near the location of this incident which we did not use.)

Now, when faced with marginal weather conditions, I have three different agencies from which to obtain weather information, and I use all of them. The other lesson I learned was to have a more realistic outlook on the capabilities of the general aviation aircraft that I am now flying. Without weather radar, one cannot navigate around imbedded thunderstorms, and most small aircraft don't have it. ATC radar is not set up to provide you with weather avoidance, either. Some general aviation aircraft have stormscopes (which detect electrical discharges), but I don't plan to bet my life on them to get around hazardous weather.

In safety publications, I had read "encounters with weather beyond the capabilities of the pilot" was the most common factor in general aviation fatal mishaps. This incident taught me that to be successful in my continuing quest to become an old pilot, my boldness (in the weather, go/no-go department) required an attitude adjustment. ■

UNITED STATES AIR FORCE

Flying SAFETY

JULY 1992

AIR FORCE SPECIAL PUBLICATION 127-2

VOLUME 48, NUMBER 7

CONTRIBUTIONS

Contributions are welcome as are comments and criticism. No payments can be made for manuscripts submitted for publication. Address all correspondence to Editor, *Flying Safety* magazine, Air Force Safety Agency, Norton Air Force Base, California 92409-7001. The Editor reserves the right to make any editorial changes in manuscripts which he believes will improve the material without altering the intended meaning.

page 5

page 14

page 16

SPECIAL FEATURES

REGULAR FEATURES

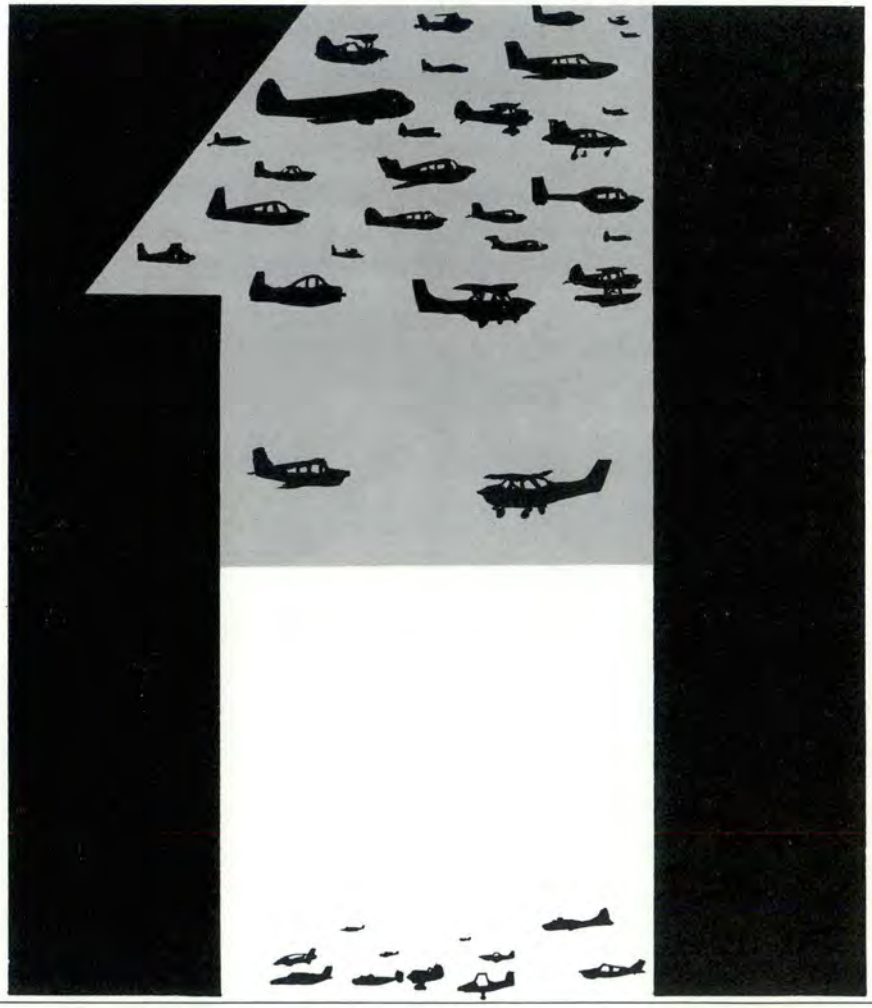
DEPARTMENT OF THE AIR FORCE • THE CHIEF OF SAFETY, USAF

PURPOSE — *Flying Safety* (ISSN 0279-9308) is published monthly by the USAF, Norton AFB CA 92409-7001, to promote aircraft mishap prevention. Use of funds for printing the publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. Facts, testimony, and conclusions of aircraft mishaps printed herein may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. All names used in mishap stories are fictitious. The contents of this magazine are non-directive and should not be construed as regulations, technical orders, or directives unless so stated. **SUBSCRIPTIONS** — For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Changes in subscription mailings should be sent to the above address. No back copies of the magazine can be furnished. **REPRINTS** — Air Force organizations may reprint articles from *Flying Safety* without further authorization. Non-Air Force organizations must advise the Editor of the intended use of the material prior to reprinting. Such action will ensure complete accuracy of material amended in light of most recent developments. **DISTRIBUTION** — One copy for each six aircrew members. One copy for each 12 aircrew support and maintenance personnel. Air Force units must contact their base PDO to establish or change requirements. AFSP 127-2 is entered as a publication at the Second-Class rate at San Bernardino Postal Service, 1900 W. Redlands Boulevard, Redlands, CA 92373 and additional entries. **POSTMASTER:** Send address changes to *Flying Safety*, AFSA/SEDP, Norton AFB CA 92409-7001.

Trouble in Threes

MAJOR ROY A. POOLE
Editor

■ As a pilot, wouldn't it be nice if we had only three things to worry about? I mean, if you knew what three things were most likely to get you in trouble with the authorities, wouldn't it be a lot easier to avoid them? Actually, more important than worrying about the authorities is making sure you don't put your own life at risk. Well, there's a lot more to think about than just three things, but three things continually show up on Federal Aviation Administration reports across the country.



One: Busting Altitudes

One of the most common pilot errors is climbing or descending through assigned altitudes. This error is made more dangerous because it usually occurs when there is conflicting traffic at or near the pilot's new, wrong altitude. Busting altitudes is normally not an intentional act. Rather, it is often a problem with one person or another not hearing correctly.

A classic example was printed in "Callback," the newsletter of NASA's Aviation Safety Reporting System (ASRS).

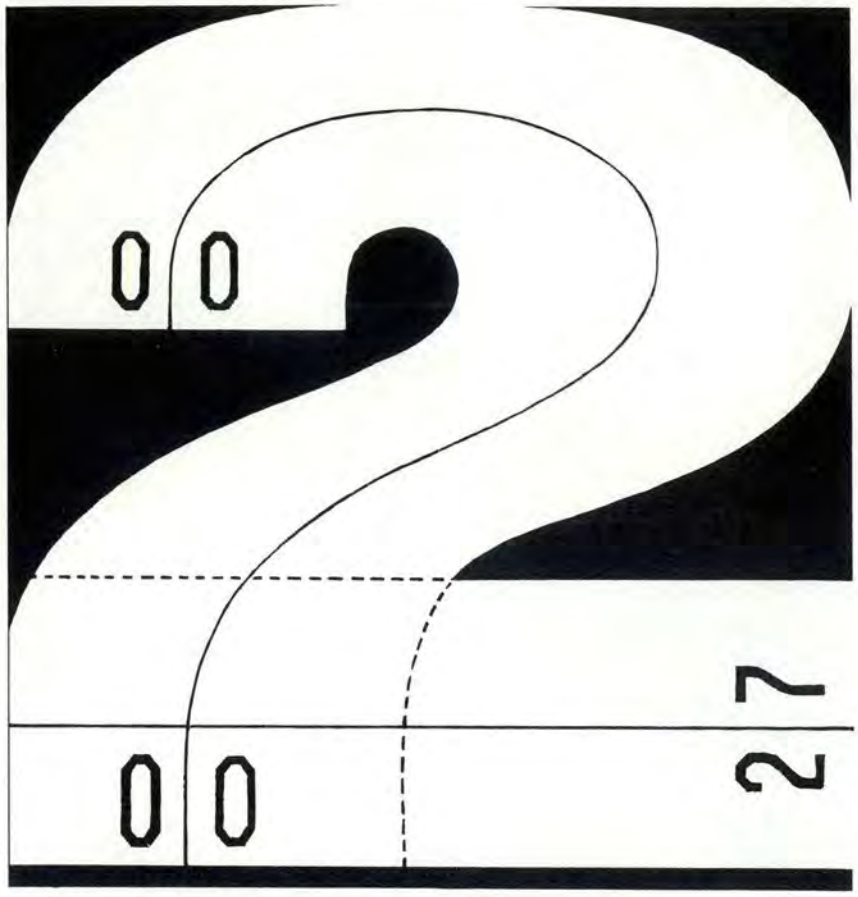
> I was Captain and the pilot flying the aircraft. We had just taken off and were being vectored during our climb. Initially, we were cleared to 10,000 feet. We were on an easterly heading, and as we approached 9,000 feet (the correct eastbound altitude, ed.) and as I began to level off, Departure gave us what I thought was a clearance to 11,000 feet.
>
> I repeated the cleared altitude of 11,000 and . . . the aircraft increased its climb rate. The copilot said what I thought was "Cleared to 11,000." As we were passing through 9,700 at a rapid rate, he said to me, "Level 10,000."

I pushed the nose over as rapidly as I could without disturbing the passengers, and we ended up peaking out at 10,350 . . .

I asked the copilot what was really said, and he said that Departure had pointed out traffic at 11,000 feet. Also that when I had said "Cleared to 11,000," the controller had replied, "He's clear at 11,000," referring to the traffic. After explaining what had happened, the controller then said, "Boy, I'll never say THAT again."

It was the end of a long day, and I misheard (confirmed by stating the altitude I thought we were cleared to) but didn't confirm with my copilot. I'll never do THAT again, either.

Aircraft busting their altitudes are not restricted to IFR and civilian traffic. The reports show almost anyone, from air carriers, to military, to VFR general aviation traffic, are capable of busting assigned altitudes. Taking a lesson from the reports, all pilots should be especially wary around VORs since these are frequently the places where IFR and VFR aircraft are either directed or choose to make altitude changes.



Two: No, the OTHER Runway

Have you ever lined up for a landing on the wrong runway? How about missing the assigned taxiway on your way to the fuel pumps at a strange field? Even on the clearest of days, it is possible to mistake a runway at one airport for the runway at another airport. A look to the east of Ellington Field, south of Houston, shows how a little diverted attention could have you lining up for a landing on a much shorter runway.

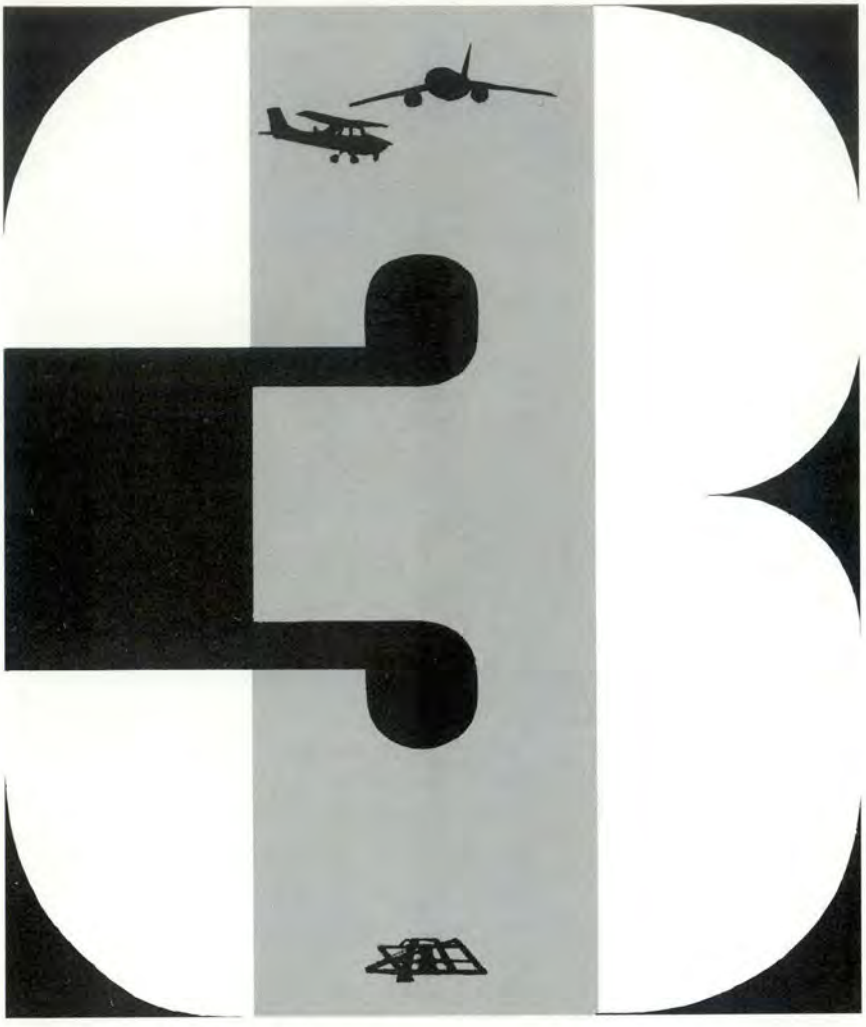
The word is out for some of the more notorious runway and taxiway traps, like those at Kelly Field in San Antonio. Also from "Callback" comes this pilot's report through the ASRS.

> I sighted the airport and was cleared for a visual approach to Runway 35 . . . I had difficulty lining up with Runway 35 because the lighting seemed poor, but having landed on Runway 35 three previous times, I was confident I had the runway. On short final, I noticed there was no edge lighting or VASI, and that the centerline lights were green. Although none of this seemed correct, I was sure I had the runway: I rationalized the strange and missing lights as a result of lightning strikes which the tower had been talking about.
>
> It never occurred to me to check the Directional Gyro . . . until the nosewheel lowered and I saw the yellow-painted centerline. Even then, I still refused to let go of my belief I was looking at Runway 35. After shutdown, I checked the airport diagram and determined I had landed on taxiway Echo.

In many cases, the trespassing pilot doesn't even have to leave the ground. The pilot will cross active runways without clearance, or enter closed or one-way taxiways causing an immediate safety conflict. Another frequent mistake is taking the active runway for a departure without tower clearance. This poses an instant hazard to aircraft on short final which must make a last-second go-around or risk collision. continued

Trouble in Threes

continued



Three: Violating THE Airspace

THE airspace means terminal control areas (TCA). Nothing is guaranteed to raise the ire of air traffic controllers more than having an unauthorized aircraft enter the airspace they have been working so hard to keep safe for all the participating traffic. Along with TCAs, we will add airport radar service areas (ARSA).

While pilots may accidentally "bust" an altitude, there is no doubt they will "violate" the TCA boundaries. Controllers are very good, and very persistent, at tracking violators to a landing where they can be met by an FAA representative. The FAA is not intent on punishing pilots with an immediate violation, but the severity of entering a TCA cannot be lightly treated as a simple mistake.

Were it not for the instructor on board during the following ASRS-reported incident, this pilot might have violated a TCA.

> The pilot in command was cleared to maintain 1,500 on climbout from an airport underneath the lateral boundaries of a TCA. The pilot requested 2,500 feet upon initial call up to Departure Control, and was told to "Maintain 1,500 feet. Turn to 190 degrees. You're cleared on course."
>
> The pilot then began a climb to 2,500 feet. I reminded him he was not cleared out of 1,500 feet. He replied he thought "cleared on course" meant he could climb to requested altitude. The base of the TCA was 2,000 feet, so we returned to our assigned altitude.
>
> I gave the pilot considerable guidance on ARSA/TCA clearance procedures.

Another commonly misunderstood phrase which can cause a pilot to violate a TCA or ARSA is "Resume own navigation." This does not mean you can change your altitude, nor does it mean you can enter the special use airspace at your discretion. Neither "cleared on course" nor "resume own navigation" cancels a previously issued altitude restriction.

A Single "Fix" Cures All

The three most common pilot errors highlighted here can almost always be cured with one basic improvement. Pilots, and on some occasions controllers, need to improve their communication skills.

Effective communication is accomplished along a two-way channel. The person sending the message must do so clearly and without error. The person receiving the message must hear it, and if it is not fully understood, clarify the message before taking action. While plain English is often the best tool to clarify messages, a better place to start is with the *Airman's Information Manual*. It is the FAA's official guide to basic flight information and air traffic control procedures. It also contains the pilot/controller glossary which so frequently causes misunderstandings.

The *Airman's Information Manual* has another benefit besides better communications — it will help you to avoid the other 1,387 pilot errors that are seen daily throughout the country. ■

Avoiding the Crunch

CMSGT ROBERT T. HOLRITZ
Technical Editor

■ It's a fact of life. Sooner or later, every pilot will botch a landing. Fortunately, in light aircraft, most poor landings result in little more than injured pride and are quickly forgotten. But there are times when a bad landing can strike terror in the heart of a pilot and destroy the confidence which took hours of flying time to build.

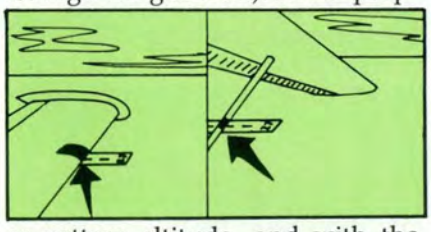
The fact is, while a botched landing may be an isolated incident, it may also be an indication of complacency or poor technique. For this reason, most pilots would benefit from a periodic self-review of basic landing techniques, because a lot of bad habits can be learned between biannual flight checks. The following is a review of some common errors in landing technique and how to avoid a botched-up landing.

Flying the Pattern

The litany of events leading to a bad landing often begins when the pilot enters the traffic pattern on the downwind leg. In fact, a good downwind leg is essential for a good base leg, and a good base leg is essential for that good final approach.

Many downwind problems can be avoided by flying the correct pattern altitude. This means calling the tower or unicom, if available, for an altimeter setting and being at the proper altitude *prior* to entering the pattern. Too much altitude on downwind usually results in a high final with too much airspeed, and can cause the pilot to land hot or overshoot the runway. Conversely, not enough altitude on downwind can result in a low final approach and possibly cause the aircraft to land short.

Another common downwind error is flying too wide a pattern. This often causes a pilot to make a late turn to the base leg and sets the stage for undershooting the landing point. A good way to set up the proper distance from the runway is to place the centerline at a specific point on the wing (or on the strut for high-wing aircraft). At the proper pattern altitude, and with the wings level, the aircraft will be at the correct distance from the run-



continued

Avoiding the CRUNCH

continued

way when the centerline is on the aircraft reference point.

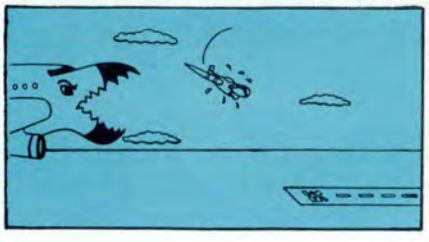
Airspeed Control

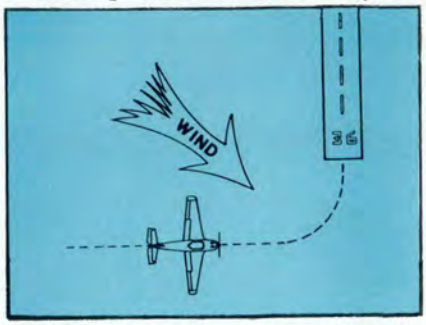
Airspeed control is the most important factor in making a good landing. Critical airspeed control begins on the downwind leg. As the aircraft flies abeam the intended landing point, reduce power and slow to a speed no faster than the "top" of the flap operating range, but no slower than 1.4 times the calibrated stall speed. (Don't forget, the stall speed is increased for a heavy aircraft.)

When extending the flaps, trim the aircraft to maintain the proper airspeed. Maintain this speed on downwind and base leg. After turning final, with wings level, slow the aircraft to the airspeed recommended in the operator's handbook. If not stated in the book, use 1.3 times the calibrated stall speed for the aircraft's actual landing weight. Maintain this speed unless you encounter turbulence or wind gusts, in which case it is a good practice to add about 10 percent to your approach airspeed.

Base Leg

Compared to the final approach, most pilots consider flying the base leg a rather inconsequential maneuver. Yet, there are a lot of aviators pushing up daisies because they got behind the aircraft on the base leg. Prior to turning base, it's a good idea to be sure there isn't some "aluminum cloud" on a long approach. This is especially true at uncontrolled airfields. However, even at controlled airfields, pilots and controllers can make mistakes, so "see and avoid" is the name of the game. It is also prudent to announce your intentions over the radio so other pilots know you are there and what you intend to do.





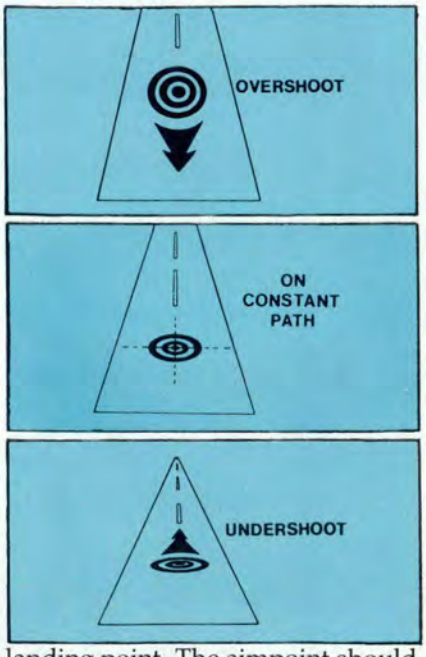
If at all possible, the base leg should be flown into the wind. Many pilots get into trouble turning final with a tailwind. They try to salvage a late turn to final approach by making a steep bank and forget the stall speed increases during a bank.

The result is a deadly cross-control stall close to the ground with no chance for recovery. Limit your turns to final to no more than 30 degrees of bank. The bottom line is DON'T TRY TO SALVAGE A BAD BASE LEG. Instead, fly a missed approach, and try again.

On Final

A stabilized approach is the best insurance for a good landing. Stabilized means establishing the glidepath and correct airspeed early on final.

When landing on an airfield without a VASI, pick an aimpoint. An aimpoint is a reference point at the end of your glidepath. It is not the landing point. The aimpoint should remain in a constant position in your windscreen. If it appears to be moving away from you, it is an indication you will undershoot your aimpoint. If it appears to be moving toward you, you will overshoot the aimpoint.



Once the desired airspeed and glidepath have been established, maintain your pitch attitude. You can stay on glidepath by making

A CALCULATED LANDING

If unsure about the proper landing speed for your aircraft, use the following:

1. Calibrated stall speed _____
   example: book = 53 KCAS
2. 1.3 X stall speed _____
   example: 1.3 X 53 = 69 KCAS
3. Gusty winds X 10% _____
   example: 10% X 69 = 76 KCAS

only minor power adjustments. Adding power will make the glidepath shallower; reducing it will make it steeper. Don't get suckered into changing the pitch attitude to stretch the glidepath. Raising the nose with the elevator not only increases the rate of sink, but you may not have enough airspeed to make a flare. This can lead to a hard landing, or worse, a deadly stall.

The Flare

For most fliers, the flare is the most difficult phase of landing. Entire books have been written on how to execute a flare to a smooth landing. It is a complicated procedure because it occurs at slow airspeed when the controls are mushy, and it takes place near the ground and requires good depth perception and judgment.

Ideally, the flare is made so the wheels are only a few feet above the ground. The problem is even high-time pilots often have difficulty judging how high the wheels are from the ground during the flare. If the roundout is started too low, the aircraft will land on the nose wheel, possibly causing it to wheelbarrow or ground-loop. Flare too high and the aircraft will sink as the airspeed bleeds off, resulting in a crunched landing.

According to CFI Ron Kramer, who has trained hundreds of students, depth perception depends a lot on the pilot's looking angle while approaching the flare. Focusing on a point too close, the runway is seen as a speed blur which significantly hampers depth perception. This blur has a tendency to make the pilot flare too high.

LOOK-ANGLE VERSUS DEPTH PERCEPTION EFFECT

On the other hand, focusing too far down the runway also degrades depth perception. If you have a bad habit of flying your aircraft onto the ground before you're ready to touch down, you could be looking too far down the runway during the flare.

Most instructors teach students to focus on a point just forward of the speed blur. As the airplane slows down during flare, the blur moves aft, and the look angle increases accordingly. For the best depth perception, view the runway environment, with your peripheral vision along the side of the aircraft's nose at about the 9 o'clock position.

Ballooning

Ballooning is one of the most common causes of hard landings. It occurs during roundout when an aircraft encounters a headwind gust or when the pilot pulls the nose too high. If the pilot senses the in-

cipient rising early, it can be dealt with by lowering the nose slightly. However, a ballooning aircraft can leap 20 to 30 feet with little warning. In this case, avoid the temptation to lower the nose to put the aircraft on the runway. Instead, maintain the pitch, and add enough power to allow the aircraft to settle gently on the runway. Or, GO AROUND.

Go Around

A study of general aviation landing mishaps shows many could have been avoided if the pilot elected to go around instead of trying to salvage a bad approach. A safe pilot makes the decision to go around early. The longer the delay the more complicated the situation becomes. If you consistently fly the same pattern, it is easier to recognize when something just isn't right.

There is, of course, one circumstance when a go-around is no

longer an option: If caught by an unmanageable crosswind during the flare, and you won't be able to clear an obstacle at the end of the runway, the best option is to set the aircraft down and slow it as much as possible before departing the end of the runway. The end result may

be a crunched airplane, but the impact will be a lot less severe than flying into an object at takeoff speed.

This situation can usually be avoided by picking a window in which a go-around can be made. For example, by making a mental note that if the wheels are not on the ground by the 2,000-foot-remaining marker, a go-around is in order. Past the 1,000-foot marker, a go-around cannot be made (or you may not clear obstacles at the end of the field). This makes the decision easier to make.

To Sum It Up

Fortunately, most landing mishaps are not serious. But they occur more frequently than they should. Hard landings are usually the result of poor planning or complacency. A safe pilot continues to work on landing techniques just as a golfer strives to perfect each swing. ■

TIED AND TRUE TIE-DOWNS

MAJOR ROY A. POOLE
Editor

■ One of the saddest sights for all of us who have struggled to earn enough money for 3 hours of rental time each month is the news photograph of perfectly good airplanes lying on their backs following a hurricane. No matter where you live, there are high winds as a result of hurricanes, tornadoes, typhoons, cyclones, or thunderstorms. Even with these damaging winds, however, a light airplane capable of flying over 100 mph doesn't have to end up as scrap aluminum.

Proper tiedown procedures can prevent most of the wind-related damage you may experience in light aircraft.

Pick a Good Anchor

The first step to a safe tiedown is analyzing the tiedown anchors themselves. You should have three tiedown anchors as a minimum: One for the tail and one each for the wings. The tiedowns should each have a holding strength of 3,000 pounds. Some twin engine aircraft may require tiedowns with a strength of 4,000 pounds. Tiedowns installed by the airport manager will invariably meet this requirement, but there will be times when you must put your own tiedowns in the ground.

If you have flown to a grass strip, or if you must park in an area where tiedowns are not provided, then you must put some into the ground. Some permanent auger-style anchors will hold in excess of 6,000 pounds, but they are anything but portable. Before you buy a portable anchor kit, check to make sure you have the desired 3,000 pounds of strength for each anchor. One thing you *never* want to use is a wooden stake driven into the ground at an angle. It will almost surely pull free when the winds are highest.

Select the Proper Rope

After you have located or installed the tiedown anchors, the next step is selecting the correct rope or chain to use. As with the anchors, the ropes should have a minimum tensile strength of 3,000 pounds. If you are using a nylon or Dacron™ rope, a diameter of at least 3/8 inch should give you the correct mini-

Tiedown ropes come in all sizes, as these two pictures show. The thinner rope on the left will probably fail when the wind picks up.

Chains are often used in place of rope. Fastened too tightly, like the chain to the left, chains can cause immediate overstress in a gust.

mum tensile strength. If you are using polypropylene rope, you'll need a rope at least 7/16 inch in diameter. In either case, check the spool the rope comes from for the rated tensile strength. If you are flying a twin engine aircraft, the ropes will need to be at least 4,000 pounds tensile strength.

Occasionally, you may see manila or hemp ropes being used for tiedowns. While manila ropes in excess of ½ inch may provide the desired tensile strength, manila is subject to mildew and rot. Both will weaken the rope by an unknown amount.

Even steel cables are not the ultimate answer. Due to their lack of stretch, sudden gust loads can cause steel to snap in situations where the more elastic ropes will hold. Steel chains are also subject to failure at the shackle and at any unidentified weak links.

Tie a Tight Knot

Now that you have a proper anchor installed and have selected a suitable tiedown rope, the next step is to tie the aircraft down. Locate the tiedown rings under the wings and on the bottom of the fuselage near the tail. Use a reliable knot, like a bowline or square knot.

Do not tie the ropes too tight or too loose. The ideal tension leaves about 1 inch of slack in the rope. Ropes tied too tightly can actually cause a downward pressure which stresses the aircraft structure in a negative direction which it was not designed to withstand. Ropes tied too loosely will allow the aircraft to jerk against the anchors, causing stresses at the aircraft tiedown rings.

Lastly, if you have a high-wing aircraft which does not have tiedown rings installed, *do not* tie the rope directly to the midpoint of the lift strut. As the name implies, the lift strut is not meant to be pulled down from the middle. Failure of the strut, with resulting wing damage, is almost guaranteed to happen if you place the tiedown rope here. By now, all manufacturers have provided instructions for authorized mechanics to install tiedown rings on those aircraft originally delivered without them.

Safe in Any Storm

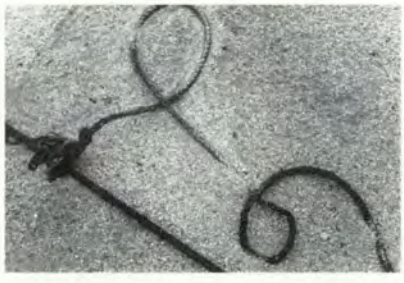
Once the aircraft is securely tied down, install the aircraft gust locks. If the manufacturer's supplied lock (usually for the control yoke) is unavailable, there are a number of after-market locks for flight control surfaces. Make sure they all have a safety streamer attached so they will not be forgotten when the winds have died down and you're ready to continue your journey.

Pilots who have survived extreme windstorms have reported it *is* possible to safely weather the storm. They say yellow, polypropylene rope, ½ inch and larger, has almost no chance of failing. The other common failure with tiedowns occurs in either steel cables or manila ropes. Both are subject to considerable and accelerated chafing during the storm, and both are more likely to fail because of the chafing.

For more information about effective ways to tie down your aircraft, get the FAA Advisory Circular number 20-35C, *Tiedown Sense.* It is available free from the U.S. Department of Transportation, Utilization and Storage Section, M-443.2, Washington DC, 20590. ■

Here's the wing of a $100,000 airplane "secured" with a $20 rope and a 10-cent slipknot.

There's an excellent chance this improperly fastened chain end will come free during the first gusts.



Neither of these tiedown ropes are trustworthy — they've been exposed to the elements too long.

Are You Really Looking?

TORGER TOTUSEK
APC Long Beach FSDO
Courtesy of *SoCal Pilot*

■ In the last few decades, we have seen tremendous changes to improve the safety of the aircraft we fly and the airspace we fly in. Unfortunately, our eyes, which are the single most important safety sensory mechanism, taking in 80 percent of the information we obtain when flying, haven't changed in thousands of years. Also unfortunate is that our eyes, which are the key element in avoiding midair collisions, have inherent limitations which work against the see-and-avoid concept! In the same way we learn to manipulate our hands, arms, and legs to control the aircraft, we must understand the limitations of our eyes and how best to control them. Only then will we maximize our chances of observing and avoiding the potential midair.

The following are some of the major limitations of the eye and how we must compensate for them.

Visual Acuity/Focus

The eye can perceive light rays from an arc of nearly 200 degrees, but it can only focus on and classify objects within a 10- to 15-degree cone. As an example, focus on a word in the middle of this page, and you will note words on the edge of the page will be visible but blurred. The reason for this is that on the back of the retina there is a small area called the fovea which only contains cells called cones. These cones provide the greatest daylight visual acuity, but since the fovea is small, a clear image can only be formed in this small area.

The rest of the retina is mostly covered by more light-sensitive cells called rods. These rods provide poor visual acuity but can perceive motion. Unfortunately, aircraft on a collision course will not present any relative motion. The way to overcome this limitation is to scan in blocks of 10 to 15 degrees, and if you perceive some motion in your peripheral vision, then turn your head toward the moving object and focus on it. Do not use a constant head

motion as it will not be effective due to the next limitation which is called accommodation.

Accommodation

The adjustment of the eye's lens to sharply focus an image on the retina is called accommodation. An eye/brain feedback mechanism changes accommodation by adjusting the lens to provide the highest degree of visual acuity. Unfortunately, when the eye is at rest, it accommodates to an average distance from resting accommodation and prefers to focus on objects at arm's length. This is not very helpful when we are trying to sight an object a mile away! While driving, signs and the road ahead are objects we can focus on, but in flight, on a hazy day or at night, very few objects exist.

Other factors hamper our ability to accommodate to distances. A dirty windshield will tend to make our eyes focus to it rather than a distant object. As illumination decreases, as in nightfall, there is less contrast between objects; therefore, this lack of visual stimulation will result in our eyes trying to return to the resting state. Also, when the vision in one eye is blocked by a strut, the other eye will compromise to the resting state. The way to beat this limitation is to keep your windshield clean, continually and conscientiously focus on distant objects, and, finally, maintain a scan pattern which keeps both eyes looking around for any possible aircraft obstructions.

Blind Spots

Believe it or not, there are two blind spots in the eye. The one we are most familiar with is where the optic nerve enters the back of the retina, therefore leaving an area where no light-sensitive cells are present. To observe this blind spot, draw two X's approximately 3 inches apart on a piece of paper. Close your right eye and hold the paper a foot away. Observe what happens to the X on the left as you concentrate on the right X and move the paper toward you. Fortunately, having two eyes compensates for this limitation, but only if both eyes are looking.

If one eye is blocked by a strut, the situation is no different than closing your right eye. The other blind spot is the fact the cones on the fovea are sensitive only to light and, therefore, are relatively useless at night. To overcome these two blind spot limitations, you must maintain both eyes looking, and at night, look slightly to one side of an object you feel you observed in order to get the object's light to fall on light-sensitive rods.

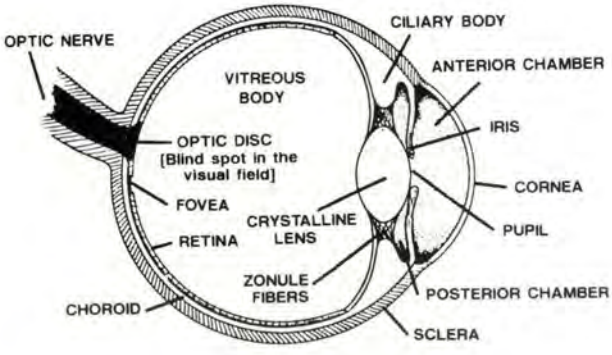
Physiological

There are physiological limitations we can control easily. It is well known alcohol in the blood can impair vision by affecting muscle balance, tending to cause the eyes to see cross-eyed. Carbon monoxide levels increase when smoking which reduces visual acuity. Hypoxia can result in an improper supply of oxygen to the retina, resulting in a degradation of visual sensitivity, especially at night. At 8,000 feet, your visual sensitivity is only 80 percent of what it is at sea level, and at 13,000 feet, it is only 60 percent. Maintaining a good diet and taking vitamin A will improve your night vision. Also, the rod cells in our eyes do not adapt as quickly as the cones; therefore, you should allow as much as 30 minutes for your eyes to adapt to darkness before flying. While flying in bright sunlight or above white clouds, be sure to wear adequate eye protection to avoid overexposure.

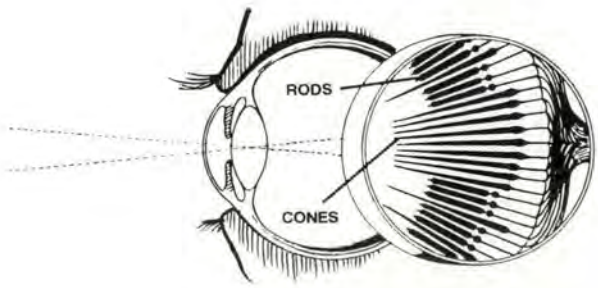
Even after overcoming these limitations, there are still a couple of other ways to minimize your chances of a midair. Be aware of other aircraft in the airport traffic area before you enter it. Monitor the tower frequency inbound, and look for the other traffic ATC is communicating with. Get as much help from ATC as possible whether you are in an airport environment or on a cross-country. Time permitting, they will be happy to give your VFR advisories. In a recent study, it was found that 1 second of search with an advisory was as effective as 8 seconds of search with no alert. Keep your eyes out of the cockpit. A general rule of thumb is for every 5 seconds looking inside, you should be looking outside 20 seconds.

In summary, it is important we concentrate and work at the task of controlling our eyes for collision avoidance. ■

References: *Flight Training*, May 1991, and Jeppesen Sanderson, CFI Renewal Program, Vol 1, Issue 7



Cross Section of the Right Eye



Cross Section of the Retina Showing Rods and Cones

HEY MEL! PASS THE MASKING TAPE!

MAJOR ROY A. POOLE
Editor

■ Have most of you light airplane fliers met Mel? Probably not. He was introduced only to those who have bigger airplanes which were likely to see service as a commercial aircraft. Mel is really the FAA acronym for Minimum Equipment List. Without a MEL, many aircraft would not be granted an airworthiness certificate.

So why haven't you heard of a MEL for your favorite 172 or Indian? Because it isn't required for noncommercial aircraft, most manufacturers never created one. Unfortunately, without a MEL, the FAA decided the only way to tell if your light aircraft was safe to fly was to fly it exactly as it was delivered. Since it received an airworthiness certificate just before delivery, the assumption was everything installed at the time of delivery was necessary for the aircraft's continued airworthiness.

For you and me, the real meaning of this FAA regulation was we could not have flown our airplane if a single item failed. Legally, if you were planning a 1-hour, VFR flight at high noon on a CAVU day, you could not have made a takeoff if the landing light was inoperative. While this seems a little ridiculous, what would you have done if you were planning the same flight and you discovered the inner marker beacon light would not test? If your three-light marker beacon was installed before delivery, you couldn't have made the flight.

The two of you who remained awake during your seventh grade English class are noticing the previous paragraph was written in the past perfect tense. And while it's okay for legalese, the world is hardly ever a perfect place. Pilots, when faced with a busted landing light keeping them from a double bacon cheeseburger at Maude's Airport Cafe, frequently choose the cholesterol over the letter of FAA's law. However, even logic has a place in the Federal Aviation Regulations (FAR), and a new regulation has been added to help the general aviation pilot. FAR 91.213(d) clarifies operations of aircraft without a MEL.

Returning to our busted landing light with the new FAR in hand, here is how you go about determining if the airplane is okay to fly.

First, determine if the manufacturer has a Kinds of Operation List and if the landing light is on the VFR flight operation list. If it is not, then proceed to the second step.

Second, check the airworthiness regulation under which the aircraft was certificated to see if the landing light is part of the VFR-day *Type* certificate. You will have to call your local flight standards district office of the FAA to check with a qualified

Although two VOR indicators make it easier to navigate around the ARSA, the good one on the left meets the pilot's minimum standard for a safe VFR flight.

mechanic. If the landing light is not required, then move to the next step.

Third, check to see if an Airworthiness Directive requires the landing light to be operational. You can look in the maintenance logs to see if there is a requirement. If not, keep going, you're almost finished.

Fourth, check to see if the landing light is required by FARs 91.205, or 91.207, or 91.215. Since this flight is not for hire, you don't need the landing light under any of these regulations. Now, you actually get to *do* something.

Fifth, the landing light must be removed from the aircraft. (In this case, the pilot is allowed to do this IAW FAR Part 43.) You could also deactivate the light by pulling a circuit breaker. In either case, the landing light switch inside the cockpit must be placarded with the word "Inoperative" in letters at least 1/8-inch tall. In other cases, like when you discovered the marker beacon light did not work, a qualified mechanic must remove or deactivate the part and placard the cockpit switch. By the way, your "placard" doesn't have to be any more complicated than a strip of masking tape with the word "Inoperative" printed on it.

Finally, before you go fly, the pilot in command must decide the lack of the part will not affect the safety of the planned flight. If, after spending hours tracking down the regulations and certificates, the sun is beginning to set and your planned lunch is going to be a planned supper, then an operative landing light is definitely required for safe flight.

Clearly, the time to start tracking down regulations and certificates is during the dreary days of winter when snow and cold keep you inside the hangar. There is also a side benefit to all the research you will do in advance of your first springtime flight — you'll know why your airplane is equipped the way it is. ■

MAIL CALL

Send your comments, criticisms, and/or compliments to: Editor • *Flying Safety* Magazine • AFSA/SEDP • Norton AFB CA 92409-7001.

MICHIGAN MILITARY AIRSPACE PLANNING CHART

Editor:

In your September 1991 issue of *Flying Safety*, FSO's Corner, you discussed the Colorado Springs Midair Collision Avoidance (MACA) pamphlet. I thought you might be interested in what Michigan has been doing for the last year. The Michigan Bureau of Aeronautics, in cooperation with all the military flying units throughout Michigan, combined all the MACA information from each base and developed a statewide program.

In the past, each base produced their own locally designed and published brochure, which was not always in a format that produced interesting reading or attracted much attention. Early in 1991, all the safety officers from each flying wing and squadron met and combined information.

First, *Michigan Aviation*, the state's flying safety magazine, published the article "Bullets, Bandits, and Bonanzas" in the March/April '91 issue. This magazine goes to over 17,000 registered pilots in Michigan.

Next, a humorous and attention-getting 40-minute slide briefing, using the same title, has been developed discussing military special-use airspace. It was given throughout Michigan to over 4,700 pilots during safety seminars in 1992 by Bureau of Aeronautics speakers. Its success was outstanding. Each base safety office has a copy of the slides and briefing so they may also give it when asked.

The final product of this year-long effort is the Michigan Military Airspace Planning Chart. This is being sent to every registered pilot in Michigan. Additionally, each airport manager is receiving two "flats" so it can be displayed at all public airports. We feel it is attractive and interesting enough that most pilots will take the time to read the material.

Any comments for improving Michigan's MACA program with all the military, including the Coast Guard, are appreciated.

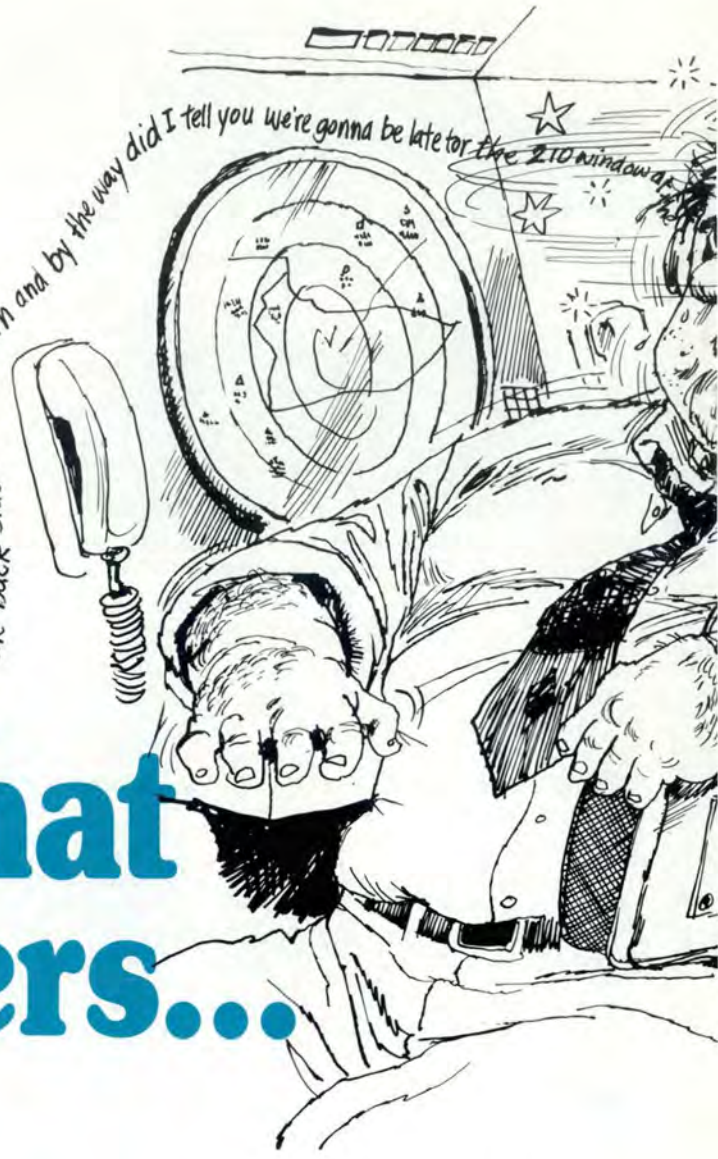
Sincerely,
ROBERT RIFFEL
Aviation Specialist
Bureau of Aeronautics
Capitol City Airport
Lansing MI 48906

Robert,

Thanks for the updates on Michigan's outstanding efforts at lowering the number of near midairs. I expect a lot of our safety pros across the country will be getting in touch with you for more information.

— Ed.

Do You Really Know What Controllers...



How many times have you wondered just what in the world an air traffic controller is doing?

TSGT JAMES M. SMITH
Tower Watch Supervisor
1942d Communications Squadron
Homestead AFB, Florida

■ Ground gives you the wrong clearance or doesn't always hear your radio calls. Radar gives you a 20-mile downwind, a box pattern, or breakout on final. Tower gives you 360s, holds you short of the runway for no apparent reason, or denies a request even though you can't see or hear anyone else in the area.

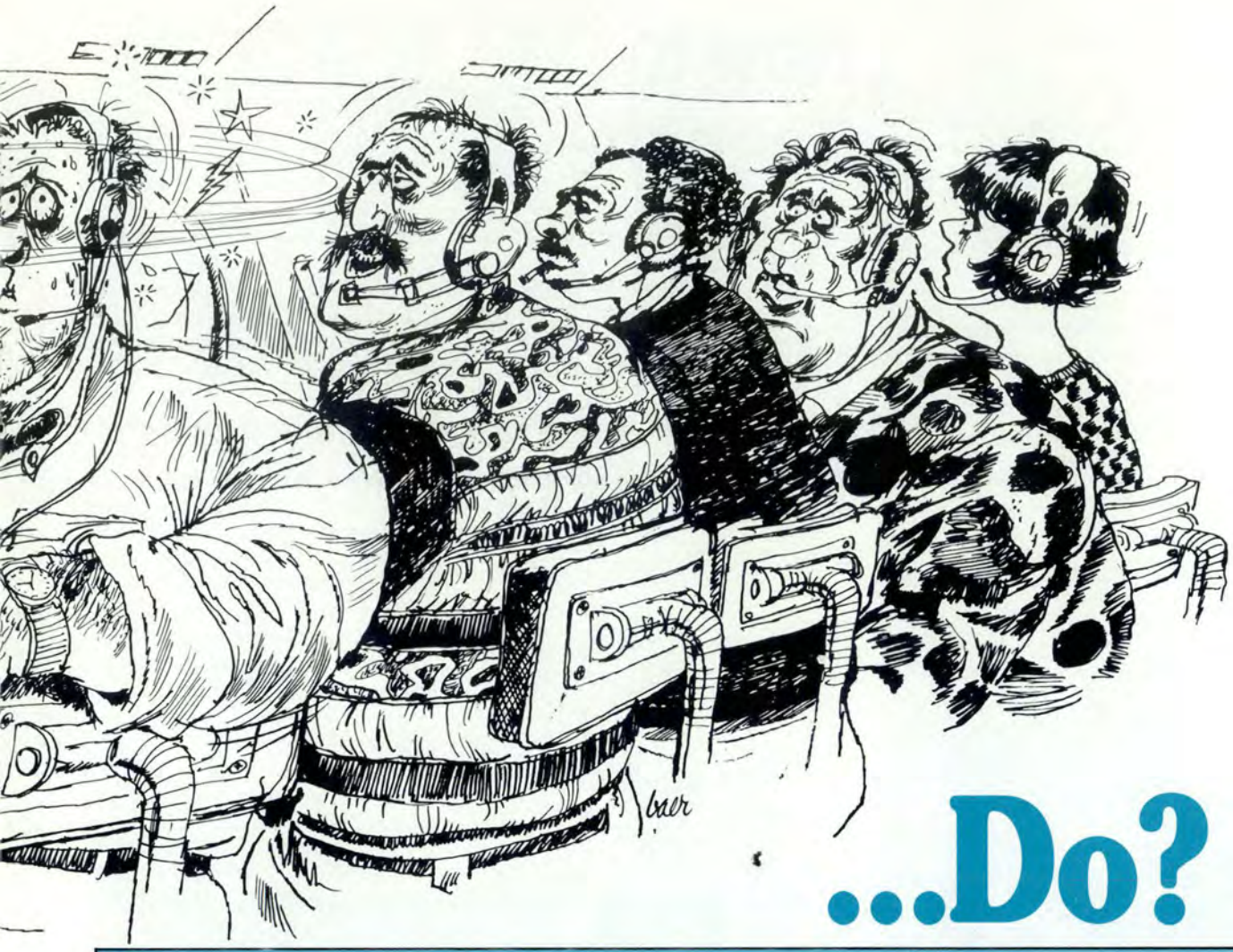
After experiencing these or other situations, you've probably questioned the controller's ancestry. Or perhaps you were tempted to vent your spleen by politely informing the folks at ATC Operations they need to hire some *real* controllers.

Well, controllers have the utmost respect for pilots. They know the major share of the burden of flying, fighting, and winning is on your shoulders. Unfortunately, many pilots don't seem to realize a controller's lot in life isn't easy either.

This is not an "Oh, woe is me," or "My job is harder than yours" sob story. Controllers know all of this comes with the job. It's what they get paid to do. But it tends to make a controller bristle when someone complains about something minor, even though the sky was full of airplanes at the time. It's also very exasperating to have situations aggravated by any lack of patience or understanding.

Do you have a good idea how your local ATC system works? Have you visited the tower or radar facility lately? If you answered "no" to either question, please stop by soon. Controllers love to talk "shop."

The bottom line is this: We can all function better as a team if we have an understanding of the demands and pressures of the other person's job. ■



...Do?

Each day, controllers must face and resolve a myriad of situations to maintain the highest level of safety.

- Controlled takeoffs vs inbound traffic
- Fast vs slow aircraft
- Wake turbulence separation requirements
- Helicopters vs fixed wing
- Paradrops during fighter recoveries
- Radio blind areas
- Late requests for nonstandard departures
- Poor aircraft radios
- ASLAR mixed with non-ASLAR aircraft
- Changing priorities
- Late flight plan and call sign changes
- Alert scrambles
- Conflicts in flight scheduling
- Special operations
- Late calls for visual straight-ins
- Weather conditions
- Equipment limitations and failures
- Airspace limitations
- Less-than-cooperative support agencies
- Fighter needs vs others
- Release delays from Departure or Center
- Computer failures
- Regulations vs real-world needs
- VFR vs IFR priorities
- SFOs through or around clouds
- VIP arrivals and departures
- In-flight and ground emergencies
- Power failures
- Heavy vs nonheavy aircraft
- Micromanagement
- Aircrews jumping frequency without notice
- Exercise participation
- The "ATC-is-last-to-know" syndrome
- Politics
- The need to train apprentice controllers
- The "everybody-wants-to-be-first" syndrome
- Wide variations in pattern flying from pilot to pilot
- The "feast or famine" nature of traffic volume
- Erroneous or lacking information from other agencies
- Pilots who ask for more when the pattern is saturated
- Noncontrollers who dictate questionable ATC procedures and priorities

The list could go on and on. In fact, many of these situations and numerous others can, and do, occur simultaneously.

MAJOR ROY A. POOLE
Editor

How to Keep the SPARK in Your FLYING

■ Ah, the romance of flying. The joy of taking a loved one aloft for a flight to a secluded vacation spot. The satisfaction from getting the engine started on the first try. But none of these will keep the spark in your flying.

The real spark in your flying comes from an extended core nose, backed up by an aluminum oxide insulator and a single iridium electrode. Yes, if your spark plugs are doing their job, all your flights will be a pleasure.

"If you drop it once, drop it again — into the trash." Trying to see a crack in the insulator of the spark plug below is virtually impossible. Cracked insulators are sure to fail at the worst possible moment.

Aviation Spark Plug Design

Spark plugs for modern piston aircraft engines are designed for long and safe service. The aluminum oxide insulator (see figure) is almost as hard as a diamond. The electrodes which form one part of the gap which a spark has to jump are made of iridium. Iridium has proven more effective than platinum at resisting lead deposit buildup. On the whole, a properly installed spark plug is almost trouble-free.

How to Abuse a Spark Plug

There are a few things which can go wrong, starting when the plugs are installed. According to the Federal Aviation Regulations, pilots are authorized to replace spark plugs on their aircraft. Obviously, the first step is to pick the correct plug. Some are designed to operate at different temperatures and with different fuels. The wrong plug, while it may fit into the engine, will burn out too quickly or foul with deposits unnecessarily.

Once the right plug is selected, always keep in mind this rule: *Once you drop a spark plug, drop it again — into the trash can*. Dropping a spark plug will probably result in a hairline, or even microscopic, crack. A cracked insulator, even though you can't see the crack, will fail within the next 10 hours of flight, sometimes with catastrophic results.

More Shocking Truths

If the spark plugs are not mishandled during installation, then the next problem may come from the magneto system. The way in which magnetos are wired causes a positive polarity spark to go to one plug and a negative polarity spark to go to another. The results are excessive ground electrode wear on one plug and excessive center electrode wear on the other plug. To keep the wear even on all plugs, they should be rotated every 50 hours of engine operation. Naturally, if the magneto is not producing the correct voltage at the correct time, the spark plugs will become fouled with lead or carbon deposits and eventually stop doing their job.

Low-Lead Is Not Low Lead

If the plugs aren't mishandled and the magnetos are working properly, then there's only one last reason why the spark plugs won't do their job — good ol' Dilbert at the controls. First, Dilbert should put in the correct AVGAS. Engines designed for 80/87 octane fuel have added tetraethyl lead at the rate of .5 milliliters per gallon of gas. The newer 100 Low-Lead AVGAS fuels have 2 milliliters per gallon of the lead additive. That's four times as much lead, lead which can build up in deposits on the spark plug and destroy performance of the plug. Whenever possible, use the fuel recommended by the pilot's operating handbook. If you can't use the preferred fuel, use the alternate fuel (often 100LL) with care.

Hot Times are Good Times

A little lead in fuel is not bad, since it lubricates the valve guides, stops detonation, and provides a cooling action to the combustion chamber. The extra lead in 100LL fuel requires Dilbert to be more aware of how the engine is operated. Another chemical added to gas in order to remove lead deposits is ethylene dibromide. It can remove lead deposits when the cylinder temperatures reach 800 degrees. Fortunately for Dilbert, 800 degrees is reached at ground idle speeds of 1,000 to 1,200 rpm. Most pilot operating handbooks recommend this engine speed on the ground.

There's No Such Thing as a Mag Check

Before takeoff, Dilbert has another chance to look after the spark plugs — the "magneto check." Dilbert must realize, however, the magneto check is not simply a magneto check. It's really a magneto, plug wire, and spark plug check. Any one of these components can cause an excessive drop in rpm. In fact, if Dilbert is sure the magnetos are working correctly and still the plugs are fouling, then the problem may be caused by an improperly adjusted mixture control, a leaking engine primer, or possibly a carburetor malfunction.

Lean, Mean Cruising Machine

Finally airborne, Dilbert still can't forget to take care of the spark plugs. The best way to do this is to "lean" the engine in flight at the cruise altitude. Of course, the procedures in the pilot's operating handbook should be learned and followed. However, if the book is not very clear about the exact way to lean, then the following works on most engines without exhaust gas temperature gauges. *Slowly* pull the mixture control out until the engine rpm reaches its highest point; then, push it back in slightly. Remember to lean the engine for every new cruise altitude along your route and also for high-density altitude takeoff situations.

There's Still the Next Time

Okay, Dilbert's spark plugs performed like champions, and back on the ground, the only thing left to do is pull the mixture to idle/cutoff. Right? Maybe, but why stop taking care of the plugs now when the whole flight has helped them. Before shutting down the engine, Dilbert should set the engine to 1,200 to 1,400 rpm to raise the cylinder temperatures to where the deposits can be burned off. Once the engine temperature is stabilized (approximately 30 seconds to a minute), pull the mixture control all the way out. As the engine dies, smoothly push the throttle all the way in. This will keep any fuel in the carburetor from leaking into the cylinders after the engine stops and thereby fouling the plugs on the bottom of the cylinders.

It's No Job for "Sissies"

The job of a spark plug has got to be one of the toughest. Temperatures can reach 4,000 degrees Fahrenheit. Pressures can exceed 2,000 pounds per square inch. A routine spark requires 24,000 volts of electricity. And to keep working for 100 hours, the spark plug will need to fire more than 8 million times. If you had a job like that, you would appreciate all the help Dilbert can give as well. ■

Not all aviation spark plugs are the same as these three plugs with different electrodes reveal. Refer to the engine manual for the correct plug.

Aircraft spark plug wires are very different from those in automobiles. Care should be taken when removing and replacing them from spark plugs.

Due to the different polarity each plug receives from the magneto system, spark plugs on the bottom should be periodically rotated with those on top.

Mounted behind the engine, there's little you can do to check this magneto until the check at the end of the runway. It's a check you don't want to skip.

IFC APPROACH

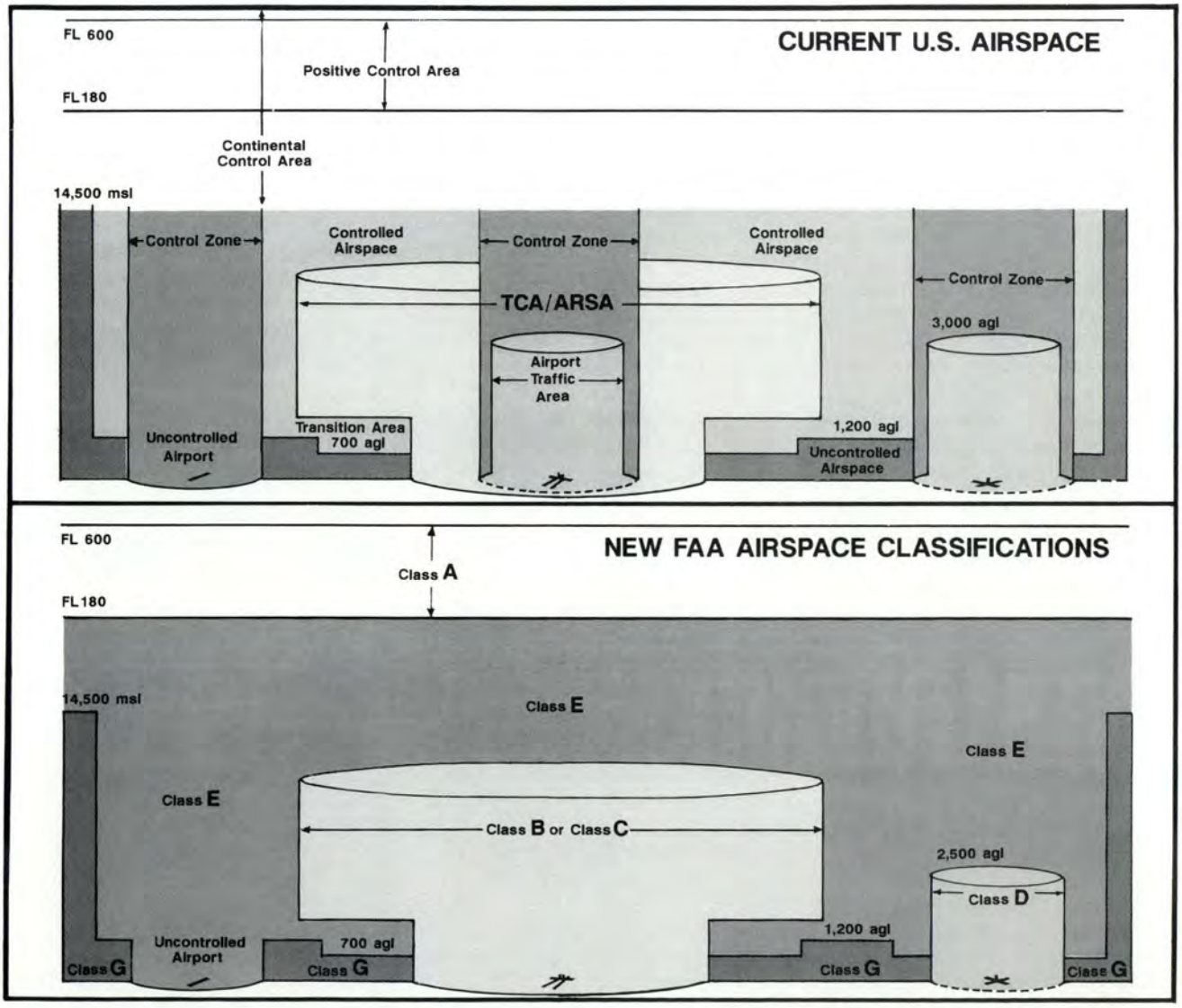
FAA Announces "Airspace" Soon To Be Spelled "ABCDEG"

LT COL CHRIS BAUM
Air Force Representative
FAA CE/GL Regions
Air Force Flight Standards Agency

■ Trick question: It's 1200Z on 17 September 1993, you're at FL 190 over CONUS, headed eastbound at less than 450 KTAS. What do you call the airspace you're in?

Okay, how many of you said PCA? BZZZZTT! Wrong ... next contestant. I guess now we know who's been reading their *Federal Register,* don't we! Well, for the other 99 percent of you, here's some news. Starting 16 September 1993, there will no longer be a PCA . . . or a TCA . . . or a CCA . . . or an ATA . . . or an ARSA . . . or a CZ. Don't panic — this is simply a practical application of the 80 percent rule (you know — when 80 percent of the

FIGURE 1
COMPARISON OF CURRENT AND NEWLY REDESIGNATED FAA AIRSPACE



crews understand 80 percent of the rules . . . change the rules).

Effective 16 September 1993, the FAA will redesignate all of the airspace in the United States except Special Use Airspace. The new designations line up more closely with the ICAO classifications. The biggest benefit of this, however, will be to simplify the process of determining the kind of airspace in which you're committing aviation and what rules apply to you and your flying machine.

Tough luck for all of you who've been trying to come up with acronyms or dirty poems to remember which one's the TCA and what ATC restrictions are in an ARSA. Now you'll have to remember your alphabet! Instead of PCA, we'll have Class A. TCAs become Class B, and ARSAs will be Class C. ATAs and control zones at airports with operating towers will be Class D. All other controlled airspace will be Class E, and uncontrolled airspace will be Class G. This is represented pictorially in figure 1.

Effective 17 September 1993, ALL pilots will need to understand the new airspace designation.

As you progress from A to B and so on, restrictions on you and your equipment gradually relax, so by the time you get from A to G, you've gone from total ATC control of everything to completely uncontrolled airspace. By the way, the absence of Class F isn't a mistake — we just can't say the "F" word in a family magazine. Either that or ICAO Class F has no US equivalent. Pick the explanation you like! A chart showing the old and new names and various requirements is shown in figure 2.

So what's the difference between

continued

FIGURE 2
AIRSPACE CLASSIFICATIONS

Airspace features	Class A airspace	Class B airspace	Class C airspace	Class D airspace	Class E airspace	Class G airspace
Current Airspace Equivalent	Positive Control Areas	Terminal Control Areas	Airport Radar Service Areas	Airport Traffic Areas and Control Zones	General Controlled Airspace	Uncontrolled Airspace
Operations Permitted	IFR	IFR and VFR	IFR and VFR	IFR and VFR	IFR and VFR	IFR and VFR
Entry Prerequisites	ATC clearance	ATC clearance	ATC clearance for IFR Radio contact for all.	ATC clearance for IFR Radio contact for all.	ATC clearance for IFR Radio contact for all IFR.	None
Minimun Pilot Qualifications	Instrument rating	Private or student certificate	Student	Student certificate	Student	Student certificate
Two-way radio communications	Yes	Yes	Yes	Yes	Yes for IFR operations.	No
VFR Minimum Visibility	Not applicable	3 statute miles	3 statute miles	3 statute miles	*3 statute miles	**1 statute mile
VFR Minimum Distance from Clouds	Not applicable	Clear of clouds	500 feet below. 1,000 feet above. and 2,000 feet horizontal.	500 feet below. 1,000 feet above. and 2,000 feet horizontal.	*500 feet below. 1,000 feet above. and 2,000 feet horizontal.	**500 feet below. 1,000 feet above and 2,000 feet horizontal.
Aircraft Separation	All	All	IFR, SVFR, and runway operations.	IFR, SVFR, and runway operations.	IFR, SVFR	None
Conflict Resolution	Not applicable	Not applicable	Between IFR and VFR Operations.	No	No	No
Traffic Advisories	Not applicable	Not applicable	Yes	Workload permitting	Workload permitting	Workload permitting
Safety Advisories	Yes	Yes	Yes	Yes	Yes	Yes

* Different visibility minima and distance from cloud requirements exist for operations above 10,000 feet MSL

** Different visibility minima and distance from cloud requirements exist for night operations, operations above 10,000 feet MSL, and operations below 1,200 feet

Formerly covered by Airport Traffic Area, this field is now covered by "D" airspace.

IFC APPROACH: FAA Announces "Airspace" Soon to Be Spelled "ABCDEG"

now and 16 September 1993? Well, not much, procedurally. That's the point. The FAA action is a **redesignation,** not creation of any new airspace. Almost without exception, it's just the names which have changed, not the flavor, color, or texture! By and large, if you know the rules now, you'll still know the rules (but you won't know where to apply them until you learn the new names).

There are, of course, some subtle changes. The upper limit of an ATA (Class D airspace) goes down 499 feet (usually, but not always). It's currently up to, *but not including,* 3,000 AGL and will become up to *and including* 2,500 AGL with an option to be adjusted on a case-by-case basis. A control zone at an airport with an operating tower will become Class D, but one at an airport with no operating tower will become Class E. For the real nitpickers, the size of an ATA will no longer be based on statute miles; it will be converted to nautical miles.

Let's not forget these are FARs, so unless there's a specific exemption, they apply to our operations. Granted, not every change to the FARs causes a change in one of our regs, but since our regs generally parallel the FARs, those of you who have the dubious honor of overseeing directives might want to start looking at the impact on our pubs and operations. I'll bet my partner's paycheck one of you has a local procedure based on an ATA or control zone. Will it have to be changed?

Remember, too, much of this airspace is depicted on charts. The plan is to print the old names followed by the new ones, starting as early as October 1992 for some charts. On the Big Day (16 September 1993), you'll start seeing the new names followed by the old. Finally, come August 1994 you'll be able to find only the PCA, TCA, etc., in the archives.

Fortunately, this multiple naming will only be on the chart legends, not the charts themselves. No big deal, but it might be nice to know before you find yourself in the auto flail mode, trying to navigate in an unfamiliar situation and wondering if you really understand what you think you're looking at. (Sounds suspiciously like preflight planning, doesn't it?) For the educators in the group, start looking for handouts, posters, videos (Waylon and Willie doing "I Lost My PCA But Found Love in Class A Airspace"???) and so forth in late 1992.

So is there a bottom line here? You bet. The world you operate in is going to be different. Not necessarily better or worse, just different, at least for the time being. That translates to potential confusion if you don't keep up with the changes. Confusion, as we all should know, can be frustrating on the ground. It can be deadly in the air. Along with your mission, your airplane, your limitations, and your broker's phone number, you need to know the rules which apply to every flight.

Lest we overlook one of the biggest advantages here, consider this: Years from now, as you lean on the bar, sipping a mineral water and chatting about your cholesterol level, you'll be able to get all misty and say, "Why, yes, Lieutenant, I do remember the old days when Class A airspace was called the PCA." That ought to clear the room. FLY SAFE! ■

In the middle of nowhere, is this Class E or Class G airspace?

Write a Dumb Caption Contest Thing ...

We've heard from some of you about a concern that we may be running out of Cheap Little Prizes. Not to worry — even in this time of austerity, the Dumb Caption Contest Thing will survive, and you can win by sending copies of this month's contest to:

Dumb Caption Contest Thing
***Flying Safety* Magazine**
AFSA/SEDP
Norton AFB CA 92409-7001

Once Again, Thanks For Your Support

AND THE WINNER FOR THE FEBRUARY 1992 DUMB CAPTION CONTEST IS . . .

SSgt William Rainey
103 CAMS
Bradley ANG Base
East Granby CT

Talk about your close contests! SSgt William Rainey barely slipped in with the winning entry past our equally distinguished list of Honorable Mention winners. Congratulations to everyone for superbly dumb captioning.

HONORABLE MENTIONS

1. **(Herc) I'm not one of those "Leave the Driving to Us" deals. You have to steer me around.**
   Major Ralph C. Mayton, Jr., Prince George VA

2. **As a matter of fact, the wing is 1.3 feet longer on this model. Why do you ask??**
   Jim Burt, Academic Training, NAS Corpus Christi TX

3. **Remember, Jack, left is the hand without the rock.**
   Major Ralph C. Mayton, Jr., Prince George VA

4. **Yes, Colonel, as you requested, both graves have been dug — one for the pilot and one for the wingwalker.**
   Major Dennis W. Kotkoski, 127 CAM/CC, Selfridge ANGB MI

5. **It's only the wingtip and ... will you stop that whining!**
   Jim Burt, Academic Training, NAS Corpus Christi TX

Ask and you will receive . . . sort of

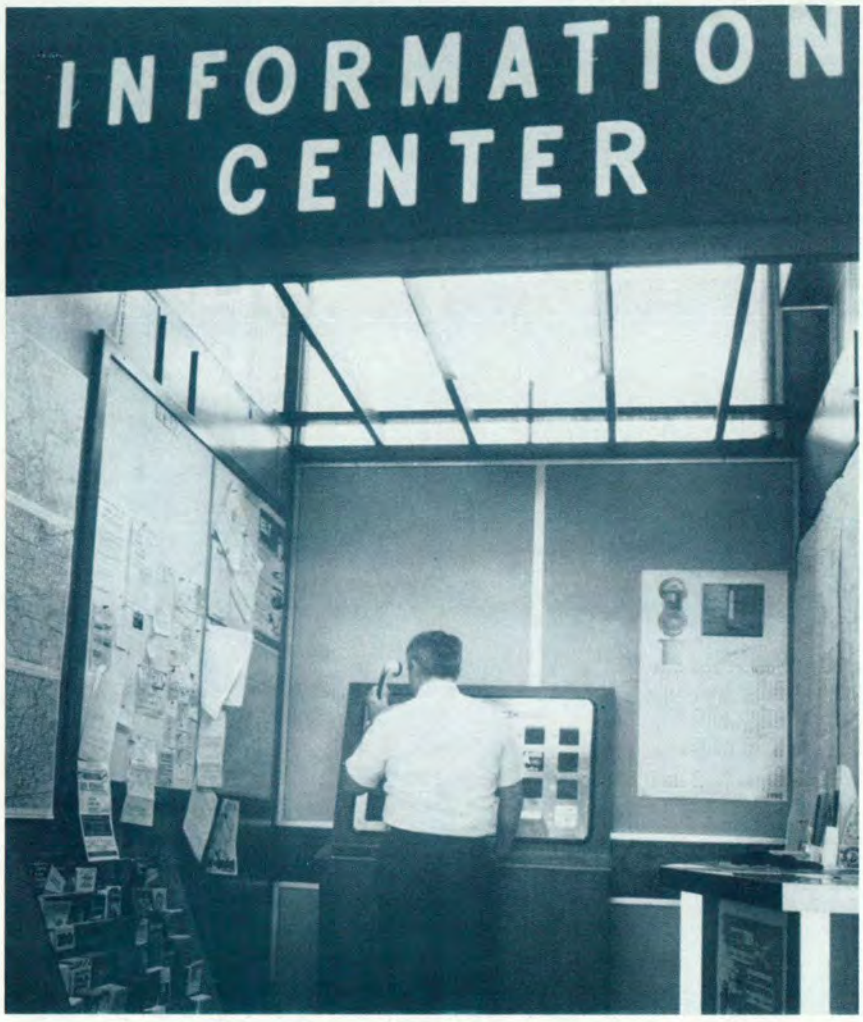
"Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight."

MAJOR ROY A. POOLE
Editor

■ Does this sound familiar? It should. It's from the Federal Aviation Regulations (FAR), Part 91.103. The Air Force says it much the same way in AFR 60-16, *General Flight Rules* — "The pilot, before departure, plans the entire flight to final destination in the greatest detail possible." Right after looking at the appropriate sections of the flight manual, the pilot is directed to check the NOTAMS and weather.

Traditionally, one of the easiest ways for general aviation pilots to meet these requirements was to call the local Flight Service Station "briefer." The pilot tells the briefer the flight is planned for an airfield halfway across the state. The briefer then asks for the aircraft identification and if the pilot desires a "standard" briefing. "Sure," says the pilot, and a few minutes later hangs up the phone, confident everything is known about the intended flight.

Imagine the pilot's surprise when the main runway at the destination is closed for repair. The shorter runway may be all right for landing, but at these density altitudes, takeoff is going to be before sunrise tomorrow morning. What's wrong with the



The first step in getting a good preflight briefing is making yourself aware of all the available information. After looking at wall charts, information handouts, and safety posters, pick up the phone and call Flight Service. Sometimes, it's as easy as pushing a button.

"standard" briefing? Nothing — if you know what to ask for, it will give you everything you need.

The *Airman's Information Manual*, Part 502, describes the different types of preflight briefings and what each entails.

Standard Preflight Briefings

The standard briefing assumes you have had no prior briefings and that you have not used any of the automated media like the Transcribed En Route Weather Briefing or ATIS announcements. Therefore, you will receive the following:

1. *Adverse Conditions* which might affect the flight. These will include weather, airdrome, or NAVAID problems. Note: If there is still a useful runway, even if it isn't long enough for your aircraft, the airdrome will not be discussed.

2. *VFR Flight Not Recommended* will be advised whenever the en route or destination weather drops below basic VFR minimums.

3. *Synopsis* is the big picture of the area you will be flying into for a period surrounding your proposed flight time.

4. *Current Conditions* are provided as they are available from the nearest reporting stations.

5. *En Route Forecast* is provided from the latest National Weather Service charts.

6. *Destination Forecast* is provided when there is a weather reporting facility at the destination. Otherwise, the briefer will give you the general trend based on the larger weather patterns.

7. *Winds Aloft* are provided for your indicated en route altitude. If you want other winds at other altitudes, you should ask for them as well.

8. *NOTAMs* which would apply to your intended flight are given. These include Class D, Class L, and FDC NOTAMs within a 400-mile radius. **Note: Class D and FDC NOTAMs which have already been published in the Class II book or the *Airport/Facility Directory* are not provided!** If you do not have access to a Class II NOTAM book, ask the briefer for those NOTAMs as well.

9. *Air Traffic Control Delays*, which will affect your flight, are provided. Usually, these delays are for IFR aircraft.

10. *You MUST request the following in a standard briefing:*

- Active MTRs or MOAs
- A review of ALL NOTAMs
- Approximate Density Altitude
- Customs requirements
- ADIZ procedures
- SAR operations
- LORAN-C NOTAMs
- Other assistance

The second half of a good briefing comes from the professionals at each Flight Service Station.

Abbreviated Preflight Briefings

An abbreviated briefing is provided to supplement the automated media briefings the pilot has already received. The pilot may have already listened to transcribed briefings or ATIS announcements; or, the pilot may have used the direct user access terminal (DUAT) services. Finally, the pilot may have received an earlier briefing and now needs an update.

After requesting an abbreviated briefing, the pilot should state the nature of the prior information or briefing. Then, the pilot should clearly state what is needed to update preflight planning efforts.

Outlook Preflight Briefing

An outlook briefing is provided when the proposed departure time is more than 6 hours from the briefing time. The briefer will clearly state this briefing is for "planning purposes only." It will not fulfill the requirements of FAR Part 91. The pilot should also recognize an updated briefing will be required, usually a standard or an abbreviated briefing.

How to Get a Good Briefing

In order to get a good briefing from a Flight Service Station briefer, you first must know what it is you are asking for. Refer to the *Airman's Information Manual*, Parts 290 and 502, and make a few notes to yourself.

Use all the available resources to get accurate information. These would include, but are not limited to, public television's daily "Aviation Weather" show, transcribed weather broadcasts, ATIS announcements, DUAT services, newspapers, the *Class II NOTAM* book, the *Airport/Facility Directory*, and the Flight Service Station briefers.

Before you call the briefer, do some preliminary planning to know your approximate departure time, time en route, and cruising altitude. If you have the appropriate charts open in front of you when you make the call, it will be a lot easier to understand the briefing and to provide additional information such as required alternate airports.

Once the briefing is underway, make notes as it goes along. Wait until the briefer is finished before interrupting a logical sequence. The risk of having some items overlooked because of your interruption can be avoided by a piece of paper and a pencil.

Finally, if you do not understand all the information you have been given, or if you believe you are missing some information, do not hesitate to ask. If you ask for it, the briefers will be happy to give it to you. They feel as responsible for your safety as you do. ■

CROSS-

■ Recently, no-notice Rex Riley surveys were conducted at 15 bases all over the world. Eleven bases retained the award, three bases claimed the award for the first time, and one base failed to meet the high standards for the award and was removed from the coveted Rex Riley Bases list. Before I highlight some of these bases and their accomplishments, I would like to cover a couple of general interest items.

The Prime Knight Program has been around for almost 2 years. Its purpose is to provide "meals, wheels, and room keys" to transient aircrews within 10 minutes of arrival. Air Force-wide, every base that has transient aircrews was supposed to have implemented this important program.

Rex Riley pilots have found a wide spectrum of Prime Knight services offered from base to base. Some bases like Kelly AFB TX or Elmendorf AFB AK seem to have perfected the system, while others claim to have it, but there is little evidence when a transient aircrew arrives. Since the Prime Knight Program relates directly to transient aircrew services (i.e., Rex Riley Award), future Rex Riley surveys will look closely at the base Prime Knight Program.

Aircrew members, even the best Prime Knight Program only works with prior notice from you. If you want Prime Knight service, it is your responsibility to call ahead to both base ops and billeting with number of crewmembers, type of aircraft, and arrival time. Sometimes a faxed copy of crew orders with estimated arrival time is all that is required. On the day of arrival, call base ops from your last point of departure to update arrival time and services requested. A courtesy call using "pilot to dispatch" 30 minutes prior to landing is usually effective.

I've noticed several bases now have designated smoking and nonsmoking rooms in billeting similar to commercial hotels and motels. This is a welcome new policy which I think each base billeting office should try to implement.

While I respect the rights and needs of the person who smokes, often the residual smoke and stale air permeates a room long after a

COUNTRY NOTES

smoking resident has left, and it is very annoying to the nonsmoker who subsequently occupies the room. Several times, Rex pilots have had to request room changes because of this problem. It's a hassle and ultimately delays entry into crew rest.

New Award Recipients

Tyndall AFB FL Rex found everything to his liking during a recent RON at Tyndall. Base ops was clean and well organized, with all necessary charts and pubs easily accessible. Crew transportation and Transient Alert were right there when he needed them. The weather shop was rated outstanding primarily because of the super service provided by the duty forecaster, SSgt Wayne Gentry.

Rhein Main AB GE Base operations and crew transportation were given outstanding ratings by Rex. SSgt Brown and Mr Gibbons, base ops dispatchers, were extremely helpful to crews during predeparture flight planning. Excellent directions were available to aircrews on SIDs, radio procedures, and all departure instructions. Rex said crew transportation was "the best he had seen in USAFE" on this TDY.

continued

Loring AFB	ME	Pope AFB	NC	Bitburg AB	GE	Fairchild AFB	WA
McClellan AFB	CA	Dover AFB	DE	Keesler AFB	MS	Mountain Home AFB	ID
Maxwell AFB	AL	Griffiss AFB	NY	Howard AFB	PM	Barksdale AFB	LA
Scott AFB	IL	KI Sawyer AFB	MI	George AFB	CA	Hickam AFB	HI
McChord AFB	WA	Reese AFB	TX	Peterson AFB	CO	Kelly AFB	TX
Myrtle Beach AFB	SC	Vance AFB	OK	Moody AFB	GA	Travis AFB	CA
Mather AFB	CA	Laughlin AFB	TX	RAF Lakenheath	UK	Norton AFB	CA
Lajes Field	PO	Minot AFB	ND	Zaragoza AB	SP	Tinker AFB	OK
Sheppard AFB	TX	Vandenberg AFB	CA	Torrejon AB	SP	Charleston AFB	SC
March AFB	CA	Andrews AFB	MD	Luke AFB	AZ	McGuire AFB	NJ
Grissom AFB	IN	Plattsburgh AFB	NY	Eaker AFB	AR	Incirlik AB	TK
Cannon AFB	NM	MacDill AFB	FL	Bergstrom AFB	TX	Selfridge ANGB	MI
Randolph AFB	TX	Columbus AFB	MS	Davis-Monthan AFB	AZ	Nellis AFB	NV
Robins AFB	GA	Patrick AFB	FL	Hahn AB	GE	Hill AFB	UT
Seymour Johnson AFB	NC	Wurtsmith AFB	MI	Kunsan AB	KOR	Osan AB	KOR
Elmendorf AFB	AK	Williams AFB	AZ	Ramstein AB	GE	Tyndall AFB	FL
Shaw AFB	SC	Westover AFB	MA	Johnston Atoll	JQ	Rhein Main AB	GE
Little Rock AFB	AR	Eglin AFB	FL	Wake Island	WQ	Misawa AB	JA
Offutt AFB	NE	RAF Bentwaters	UK	RAF Alconbury	UK	Kadena AB	JA
Kirtland AFB	NM	RAF Upper Heyford	UK	Hurlburt Field	FL	Ellsworth AFB	SD
Buckley ANGB	CO	Andersen AB	GU	Carswell FB	TX	Yokota AB	JA
RAF Mildenhall	UK	Holloman AFB	NM	Altus AFB	OK	McConnell AFB	KS
Wright-Patterson AFB	OH	Dyess AFB	TX	Grand Forks AFB	ND	Homestead AFB	FL

CROSS-COUNTRY NOTES

continued

Misawa AB JA A little off the beaten track in Northern Japan, Misawa still prides itself on providing quality service to aircrews who get up that way. Flight planning facilities in base ops are somewhat sparse, but the positive attitude and willingness to help displayed by the dispatchers earned them an outstanding rating. Although a short ground time prevented Rex from sampling some of the Misawa cuisine, he was assured by base ops folks their Burger King™ was the best in the Pacific.

Retained the Award

Kirtland AFB NM Rex had an excellent overnight stay at Kirtland. SSgt Davis and Mr Suarez in base ops were very courteous and helpful following a weather divert which forced an unexpected RON. Crew transportation was rated outstanding when Rex was provided with a UDI (you drive it) vehicle from base ops. Other bases should consider a similar program for convenience and ease of use. SSgt Price gave an excellent predeparture weather briefing the following day.

Kadena AB JA For overall aircrew service and convenience, Kadena stands well above any other Air Force base in the Pacific. Rex couldn't say enough good things about the service there. He transited Kadena six times in his C-141 over a 3-week period, and, each time, the service was outstanding. Five out of eight areas surveyed were rated outstanding. Base ops has a great flight planning facility and outstanding, knowledgeable, friendly dispatchers. You never have to wait for a weather briefing. Crew transportation was *always* there when requested. Their transient maintenance is the best I've sampled in the Pacific. Their maintainers have a great attitude and are willing to go the extra mile. Kadena also has the best on-base eating places around. The Italian restaurant and the Steak House provide quality food at reasonable prices.

Davis-Monthan AFB AZ Rex was very impressed with the services received in spite of construction going on at base ops and around the airfield. "Bare base trailers" set up for a pilot lounge/flight planning and dispatch were first class. Crew transportation and billeting were both rated outstanding. Rex received quiet, comfortable rooms right next to the O'Club with quick in-and-out processing. Transient Alert was competent and professional. If you transit D-M in the near future, you might have to hunt for the weather shop which is located in the base ops building under construction, and not by the temporary buildings.

Congratulations also go to **Little Rock AFB AR, Nellis AFB NV, Hill AFB UT, RAF Bentwaters UK, Kunsan AB KOR, Osan AB KOR, McChord AFB WA,** and **Ramstein AB GE who were surveyed and retained the Rex Riley Award.**

Removed From the List

Base X This base was removed from the list because Transient Alert personnel tried to marshall Rex's C-130 aircraft (with wingwalkers) over an 8-ft fence at the entryway to the assigned parking spot. The obstacle would have been a definite safety hazard to the C-130 wing. The airfield manager and all TA folks were debriefed. New C-130 parking has subsequently been defined. ■

MAINTENANCE MATTERS

Another Failed IPI

■ During the postflight walk around the tanker, the pilot discovered the no. 1 tire had deflated. When the wheel and tire were removed for repair, the crew chief found the inside of the wheel and the face plate severely scored and metal shavings throughout the entire assembly. Other damage included the axle and no. 1 brake assembly damaged beyond limits.

A review of the maintenance records showed the wheel and tire were replaced during the grave shift just prior to the flight. Although the task was performed by a qualified crew chief, he had inadvertently failed to reinstall the inner bearing when installing the wheel and tire assembly.

And, although an in-process inspection (IPI) was accomplished by a qualified seven-level, the inspector failed to notice the missing bearing and signed off the aircraft forms. When performing routine maintenance such as tire changes, complacency can be an insidious trap. The cost of this oversight was nearly $16,000. ■

Bug Farming in the 21st Century

■ For the past 10 years, the U.S. Air Force has been working various projects to improve the environmental safety of its aircraft corrosion and paint facilities.

They have tried using just about everything, from plastic beads, dry ice — even baking soda, as a media for blasting the paint from the surface of aircraft with varying degrees of success. The problem with all of these methods is what to do with the hazardous waste that is generated during the process.

The folks at Aeronautical Systems Division's Wright Laboratory may have found an answer to make paint stripping and disposal of the hazardous byproducts environmentally safe.

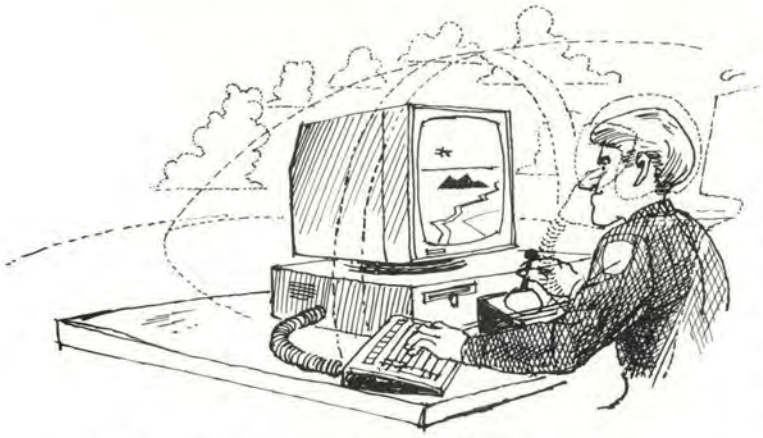
They use bugs! Not just any bugs. These are specially cultured enzymes which literally eat blast media and paint residue, leaving what little waste remains inert.

According to Capt Gary Meurer, "Our process uses specific, biologically produced fungal and bacterial enzymes which, first of all, make soluble the plastic-bead residue (the media used to blast paint off aircraft), leaving only the paint chip waste products. Then the enzymes metabolize the toxic, heavy metals in the paint chips, rendering the waste nonhazardous."

Reducing the amount of waste and making it environmentally safe could save the Air Force big bucks. Capt Meuer estimates the cost of disposing of paint facility waste can be cut from 30 cents to 5 cents per pound, leaving practically nothing to haul away.

Capt Meurer predicts enzymes will eventually be used in a paint-stripping system. But while such a system is technically feasible, a method must be found to produce the enzymes in large quantities. ■

OPS TOPICS



A PC Aircraft Simulator at Home

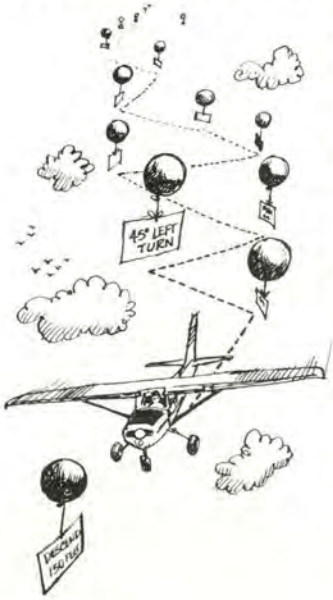
■ Glance through the pages of most of the popular magazines dealing with general aviation, and you will see more than a few software programs for personal computers (PC). Each claim to improve your skills. Depending on whose idea of an improvement it is, the programs may not be a bad investment for the light airplane flier.

First, the bad news. According to the FAA, some of the claims by the manufacturers are false or misleading. These advertisements either state, or strongly imply, FAA approval of PC adaptations of training devices for use under parts 61 and 141 of the Federal Aviation Regulations (FAR). As of this printing, the FAA has not granted approval for the use of *any* such training device software packages under either Parts 61 or 141 of the FAR, and no such approvals are anticipated in the future.

The FAA's reason for not granting approval centers on insufficient fidelity with general aviation aircraft to ensure the development of desired psychomotor skills and coordination to objectively support specific training, currency, or certification requirements. Some of the more common undesirable characteristics are unconventional instrument control methods, poor imagery and control response, and the updating of flight instruments is in incremental movements rather than smooth transitions.

There is some good news, however. The FAA has no objections to the use of software packages on PCs as training aids where such use is not credited under FAR Parts 61 or 141; or, toward the certification or currency requirements for crewmembers. PC simulator software *does* provide a good way to hone your procedural skills on instrument approaches you couldn't possibly find in your local flying area. Any time you spend preparing for the demands of instrument flying will be of benefit, even if you can't take the credit for it in your logbook. ■

FAA Removes the Guesswork



■ The Federal Aviation Administration (FAA) announced in April it is expanding a program to help private pilots navigate safely in airspace near busy airports.

The program, called Terminal Area VFR Routes, will provide pilots who fly under visual flight rules (VFR) with specific route information which will help them avoid unintentional entry into controlled airspace, such as terminal control areas, airport radar service areas, and airport traffic areas.

The concept was evaluated in the Los Angeles area in 1988 and 1989, and VFR routes are now being developed for the San Diego and San Francisco/Oakland areas. Development will begin soon on similar routes for Salt Lake City, the Washington, D.C./Baltimore area, Tampa, Orlando, Chicago, and Phoenix.

"This program takes the guesswork out of flying near restricted airspace by charting specific routes that a VFR pilot can fly rather than telling the pilot where not to fly," acting FAA Administrator Barry Lambert Harris said.

Under the program, which was proposed by the Aircraft Owners and Pilots Association, special charts will show arrival and departure routes which do not pass through controlled airspace for each small airport in the area.

The charts will also show routes through uncontrolled airspace to other airports in the area.

They will also show the altitude a pilot should maintain in order to fly above or below controlled airspace. ■

☆ U.S. GOVERNMENT PRINTING OFFICE: 1992-679-016/40019

UNITED STATES AIR FORCE

Well Done Award

Presented for

outstanding airmanship

and professional

performance during

a hazardous situation

and for a

significant contribution

to the

United States Air Force

Mishap Prevention

Program.

CAPTAIN **Brien F. Fitzpatrick**

FIRST LIEUTENANT **Michael S. Godwin**

82d Flying Training Wing
Williams Air Force Base, Arizona

■ Formation upgrade sorties in a T-38 are normally as much fun as they are work. Capt Brien F. Fitzpatrick and First Lieutenant Michael S. Godwin were in extended trail formation at 480 knots pulling 5Gs to maintain a steady platform for their wingman. Formation flying does not get much more fun than this. However, their fun was about to become a lot of work.

Without warning, the Talon shuddered, then snapped into an uncommanded left roll. The crew was able to stop the roll using full aileron and rudder deflection while slowing to a more controllable speed. At 250 KIAS, they could maintain level flight and continue their climb to a safer altitude. The wing aircraft rejoined to tell them both the inner and outer gear doors on the left wing were gone.

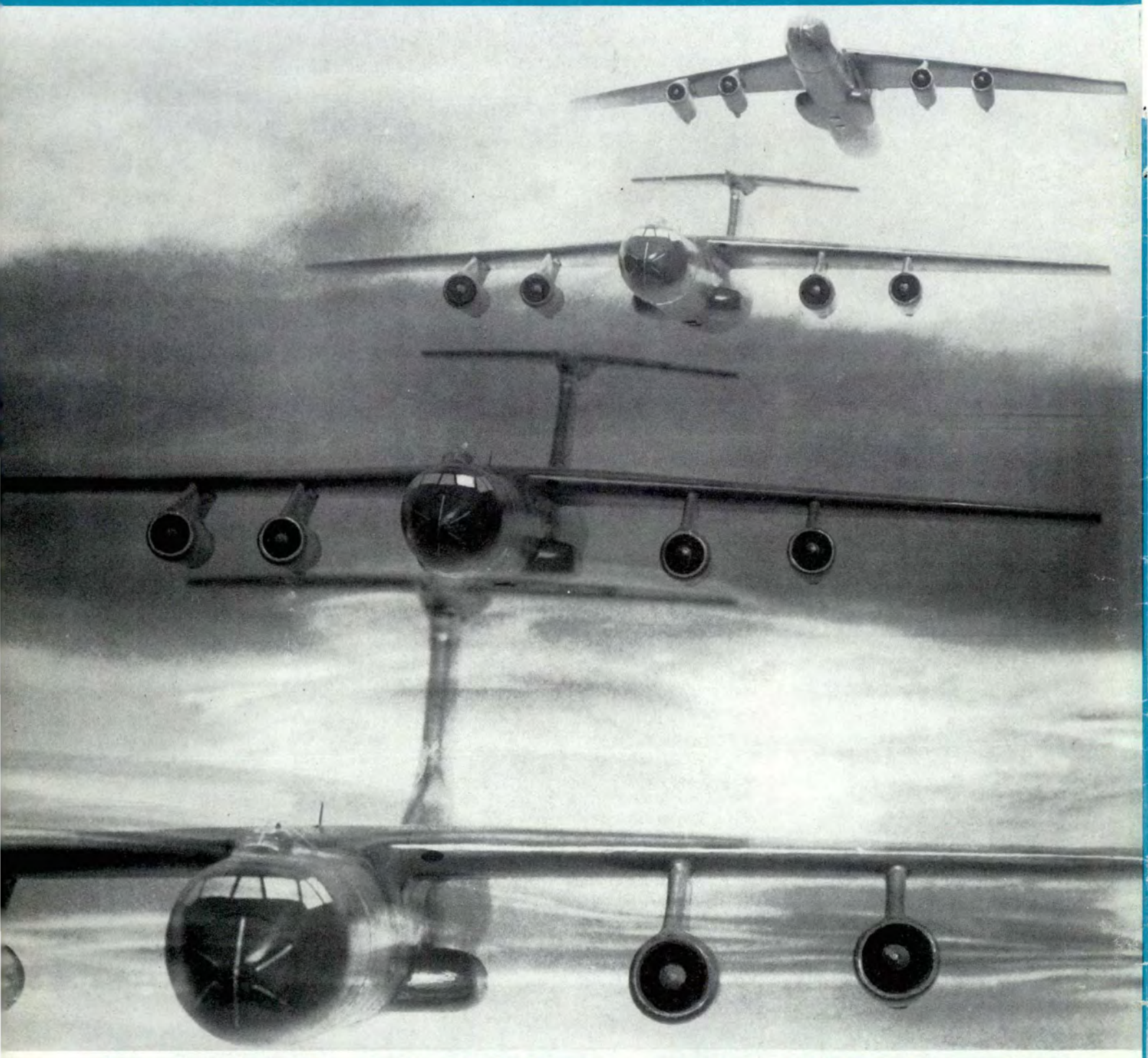
A controllability check showed both ailerons were deflected upward with the left aileron not responding at all to control inputs. However, the check showed that the aircraft was marginally controllable in the landing configuration, and the crew returned to base for a straight-in approach.

Configured for landing, the crew maintained nearly full aileron deflection to keep the wings level. All heading changes were made with rudder inputs, causing significant yawing. Despite the unusual control requirements, the crew touched down safely without incident.

Both Capt Fitzpatrick and 1Lt Godwin distinguished themselves through superb airmanship during a unique and unprecedented in-flight emergency not covered in any manual. Their skill prevented the loss of a valuable Air Force asset and potential injury to a highly skilled crew.

WELL DONE! ■

How Close Is Too Close?



SEE AND AVOID!