flying

SAFETY

FEBRUARY 1981

ENERGY CONSERVATION TIPS FOR THE PRUDENT AVIATOR

Needle, Ball and Airspeed . . .
Make for Better Gunnery Scores

Born To Fly Low

Talk To Me

THERE I WAS

■. . . a brand new aircraft commander when the Ops officer called me in to fly my first mission. I was to ferry a C-130 from Saigon to Mactan Air Base, R.P., with a put-together crew. The aircraft needed to be moved to Mactan because maintenance was not available at Saigon. The aircraft was flyable, but it had *some writeups*: the gear was chained down, the pressurization was out, all navigation equipment was inoperative except for the ADF. Other than that, it should be a piece of cake! I knew the rest of the crew but had never flown with them more than once or twice. The weather was good, and the 1,000 miles across the South China Sea should be no problem even though we would be at 9,500 feet.

I got the crew together and we were off after completing the normal preflight duties. After we left the coast of RVN, I relaxed because it was a straight shot to Mactan and we all had made the trip several hundred times. After an hour I became a little concerned because I hadn't seen any of the reefs that I knew we should have passed along our route of flight. The navigator assured us that we were right on course, though. When the island of Palawan did not show up when it should have, I became alarmed and began checking everything. Then my eyes finally got to the magnetic compass—75 degress off our desired heading. The aircraft compass/gyro had failed at some point. We used the ADF to get a relative bearing to a commercial broadcast station on Palawan and proceeded on to Mactan without further problems. Ever since that lesson, *I always check the magnetic compass* no matter how many engines or fancy nav gear I have.

(I think you have a good idea in this program.)

All the gadgets on an airplane are there for a purpose. I've always believed in using everything I've got. That practice is conducive to longevity. Thanks for your interest. A good lesson to remember.

■ The experience described below happened while I was on exchange duty flying the Harrier with the RAF from RAF Wittering, UK.

I was flying a 5-target single-ship recce mission which involved two air-to-air refuelings. After dropping off the tanker, I descended to low level over a lake in central Scotland which was the only clear area available. I noted the cloud tops at about 4,000′. The bases of the clouds were approximately 2,000′ with the tops of the mountains in cloud. The visibility was excellent. After flying for approximately 15 minutes, heading West for my first target, I ran into a snow shower which reduced forward visibility to zero. I elected to abort, selecting military power and raising the nose to 30° pitch up on the Hud which was SOP. Here is where I blew it!

Expecting to "pop out" into VFR conditions at 4,000′, I relaxed and did not continue to fly the aircraft. Passing 7,000′, I realized conditions were not as expected. Noting my attitude at 35° pitch up and airspeed decreasing rapidly, I attempted to recover the aircraft, but it was too late. The airspeed went to zero and the nose pitched down. I let go of the controls and the aircraft started into a rapidly descending spiral disorienting me. Noting my altitude at 11,000 feet, I considered ejection as I was in the vicinity of mountains which rose to 4,500′. At that moment I was spit out of the side of a large towering cumulonimbus cloud and made an uneventful recovery. Needless to say, I was embarrassed at my shabby display of airmanship. My complacency damn near cost Her Majesty a valuable weapon and me my life.

I hope all of those who haven't had this or a similar experience will read this. Flying the gages is serious business; in less than a minute the complacent or inept pilot can be in real trouble. Let's learn from the experience of others. ■

Big Gen Leland K. Luk
Director of Aerospace Safety

UNITED STATES AIR FORCE

flying

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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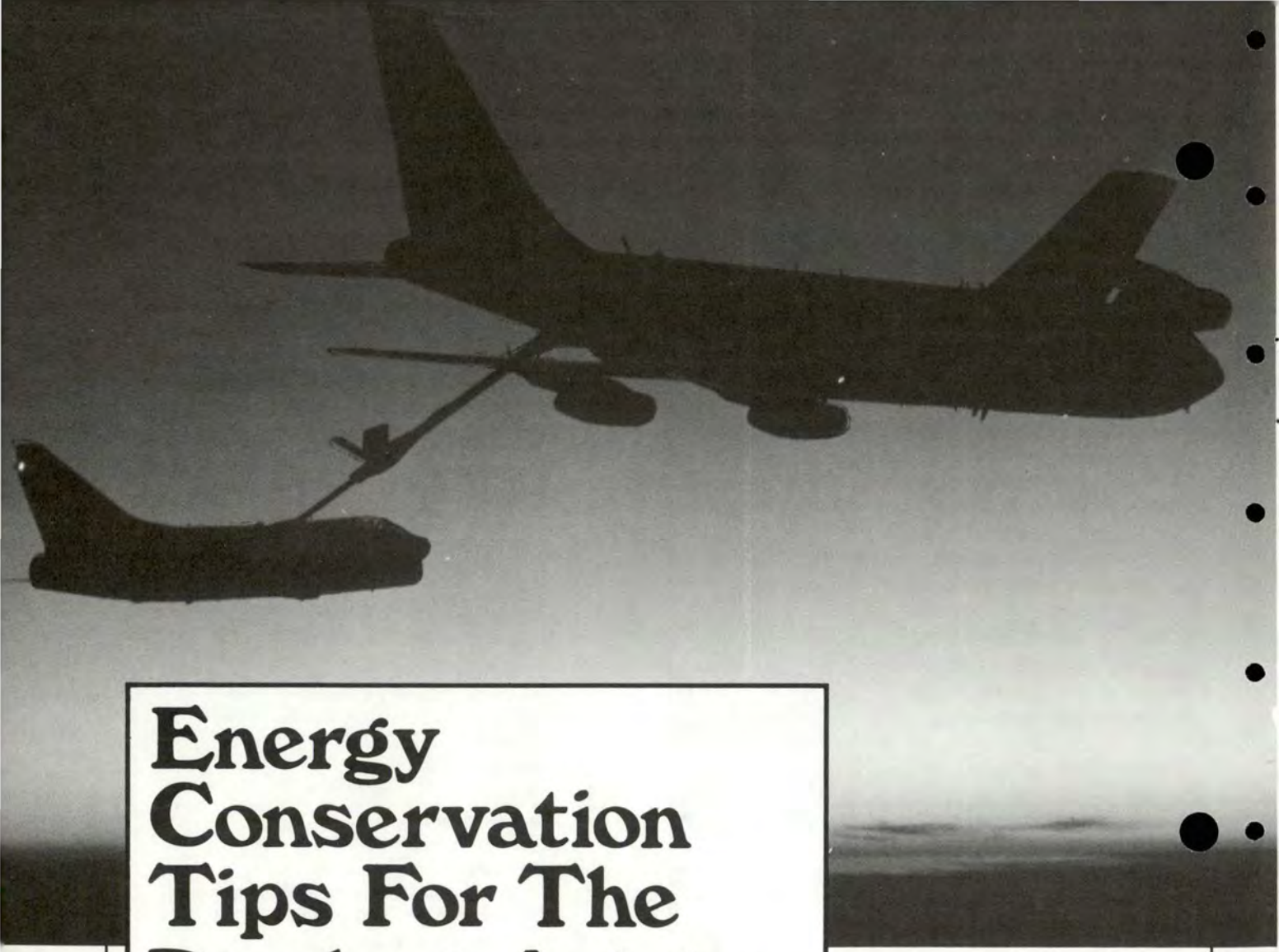


Energy Conservation Tips For The Prudent Aviator

■ When is JP-4 really JP-4? Right away the average pilot, who is almost never wrong, is on the defensive. He knows that this is obviously a trick question designed to produce a ''gotcha.'' Without regard to its validity, the question has to be one that any pilot can answer. Every pilot has to know a lot about fuel. Boy, will you feel foolish if you don't get this one. Your crew will be sincerely interested in how you do on this question.

For those of you who didn't pick up on the answer right away, *Webster's New World* defines fuel as ''any material . . . burned to supply heat or power. . . .'' For the multi-engine drivers, that information is located between Fuehrer and fuel cell. For the fighter types, look on page 584. Just kidding, guys. ATC look under F.

I'll bet most of you said something relatively close to the Webster's definition. However smart you are, you should be aware that someone at DOD has laid a trap for you. Here's how. The ''Hours Fuel on Board'' block of the DD Form 175 is ''The total time that an aircraft can stay aloft while flying the planned profile with the fuel available at initial takeoff using procedures in the appropriate flight manual.'' What's the problem with this definition of hours fuel on board? Checking back with Webster, we find that fuel is a *burned* material while FLIP assumes that all fuel onboard our aircraft is *capable* of being burned. Unfortunately, according to our records, some pilots have accepted this assumption without question. Highly reliable aircraft fuel systems have re-enforced those who equate ''hours fuel on board'' to usable fuel.

The answer to the question ''When is JP-4 really JP-4?'' is

MAJOR ARTHUR P. MEIKEL
Directorate of Aerospace Safety

"When it is burned." Until that time, JP-4 could better be defined as ballast.

The assumption that all fuel on board is usable is a reasonable one. I am not advocating a change in FLIP definitions or procedures. What I am concerned with is that crews be aware of the hazards associated with this assumption (or with any assumption). The "hours fuel on board" concept assumes no fuel leaks and no system malfunctions. However, anyone who flies and thinks systems aren't going to fail/leak should retire as a copilot.

Aircraft engineers design systems to be "fail-safe" and redundant. They guard against dual failures whenever possible. And, they are limited in what they can safeguard against. Problems that the engineer can't cope with become the property of aircrews. For instance, the C-135 is undergoing a lower wing reskin modification as a result of wing cracks which can cause the loss of up to 15,000 pounds of fuel if a crack develops at the wrong time. Fuel valve failures or electrical failures can stop the positioning of fuel valves. In this case, you can wind up with permanent ballast, a wing imbalance, or a center of gravity problem.

The next flight you have over water, desolate mountains, unfriendly territory, or polar regions, and you start to get a little drowsy, look at your fuel system and figure out what would happen if you lost one tank worth of fuel or what would happen if a particular fuel valve failed. If the answers to some of those problems could ruin your whole day, you may want to develop assumptions that are different from the assumptions in FLIP.

As a result of individual assumptions, some pilots consider usable fuel to be that which will be gravity fed if part of an electrical system is lost. Others won't start over water unless a particular fuel valve is open and the proper tank is feeding. From that point on, that valve isn't repositioned until near enough to a suitable field so that trapped "fuel" would not be a problem. In another case, pilots don't wait until reserve tank fuel is needed before they drain the fuel. They drain fuel while they still have good options available. These pilots, flight engineers, and boom operators could be considered more cautious, more conservative, better managers, or just safer than others.

If you think monitoring the fuel panel isn't required because of system reliability, look back a few years when a fuel problem started a fatal chain of events on a B-52.

What? Me worry? For those who say it can't happen to me, here are some of the more recent examples of fuel-related incidents.

A crew lost two engines on a C-135 aircraft due to a suspected fuel tank. Instead, the aircraft had a dual fuel system failure. They had shut down one engine as directed by fuel leak procedures when the second engine quit due to fuel starvation caused by a valve failure. The recovery was made even though the second engine was lost on final approach. A malfunctioning pressure light had led the pilot to an incorrect analysis of the problem.

Last year, a C-135 made a single-engine forced landing at an unscheduled destination. Three engines quit due to fuel starvation. The crew used an "hours of fuel on board" concept and landed with 22,000 pounds of ballast.

If you think monitoring the fuel panel isn't required because of system reliability, look back a few years when a fuel problem started a fatal chain of events on a B-52. A fuel pump failed and crossfeed valves were not open for takeoff. Two engines flamed out, and all crewmembers were killed.

A year ago a crew interpreted a failed valve as a fuel leak. Performing fuel leak procedures exposed the crew to unnecessary risk by requiring a three-engine landing in nonoptimum conditions. After all was said and done, the crew was on the fuel curve. It stands to reason that, if a fuel leak exists, the total fuel on board will be less than planned.

Don't laugh, it happens. ■

NEEDLE, BALL AND AIRSPEED

MAKE FOR BETTER GUNNERY SCORES

COLONEL PAUL M. DAVIS
Oklahoma City Air Logistics Center
Tinker AFB, OK

■ Several things prompt this epistle: A recent conversation with an old friend, an 0-6 at a numbered AF who is still current in a reasonable facsimile of a fighter, an article in the September-October 1980 issue of *Air University Review* by Captain John L. Barry and the number of accidents (mishaps if you prefer the current term) that come across my desk that show the crew's flying hours in the previous 30/60/90 days to be less than we all would like. The contents are meant primarily for the fighter types but there is a message for all.

The 0-6 related with more concern than pride, how he had taken "all the marbles" during a recent fighter wing gunnery competition (bear in mind he was, and had been at the time, a headquarters type of some months). He had also recently talked to a wing commander who, at that time, had been top gun in his wing for three months running. I have been fortunate to work for many good-stick colonels over the years, but with the possible exception of one, presently a four star, I can't remember many who could consistently wax the rest of the troops in gunnery. Captain Barry's message is that there is not enough fighter experience in the management level (flight commanders, Ops officers and squadron commanders) in the fighter force. Some of you would say this problem is not unique to the fighter mission.

Now, if you've read this much—read on. In a roundabout way I'm going to tell you (1) how to knock most of the colonels off the gunnery charts, (2) up your insurance coverage with no increase in cost, and (3) get the maximum training from the minimum hours.

In the 1950-51 flying school era instrument training was haphazard at best. Lots of hours, but much of it wasted on "buddy-rides." There was a lot we didn't know about weather. I quote the James Connolly AFB 1950 academic weather instructor, "You guys that go to jets will never have to worry about flying in weather above 20,000 feet. It doesn't go any higher." Apparently, when it got below

20,000 feet not many flew at all. Or so we thought. All in all, instrument training was a square to fill—not taken too seriously by the IPs—nor the students.

The 26FIS on Okinawa was my first assignment. We arrived at Naha after several missed approaches via C-54 in February 1952 in a tropical rainstorm—in time to listen to two 2/Lt friends from flying school in two F-80s groping for the runway—via an antiquated GCA unit—with a ceiling of approximately 100 feet and, charitably, a visibility of about 200 yards. They found it eventually, but in his happiness to find the concrete one landed downwind and stopped in the coral overrun—about 50 feet from the South China Sea. We were impressed! Really impressed!

During the next few weeks, we requalified in the F-80 and found: We were considered an all-weather fighter squadron; weather existed far above our service ceiling and conversely well below our minimums; and that flying on Okinawa was some sort of different from Willy and Nellis. I also discovered after falling off the wing several times in the weather what my instructors had known all along—I wasn't too sterling at keeping the light on the star either—how can you when the star disappears in the murk?

It quickly became apparent that if we planned to leave Okinawa as 1/Lts at end of tour, rather than in a pine box, we had to learn to fly the clocks. We rediscovered needle, ball and airspeed and the vertical "S" maneuvers. Whenever the opportunity allowed, we practiced basic instrument flying religiously. The result for me was when I rotated home I had acquired an excessive confidence in my ability to launch and recover in just about anything. Admittedly, my confidence wasn't necessarily shared by all for when I suggested at the daily pilot briefing that we ought to practice acrobatics and unusual attitudes in the weather, as well as under the hood, the counter suggestion was made that I ought to see a shrink. I recalled this conversation with wry amusement several years later while trying to get rid of a T-63 shape via LABs in the soup during an ORI at Misawa. Therein lies another tale. We also discovered the better we got on the gages the better our formation flying and, more important to the fighter guy, our scores on the rag and air to ground improved all out of proportion to a probable learning curve based on increased experience. This, I believe, was why the 1952 Far East Air Forces (FEAF) gunnery meet was won hands down by a major, a 1/Lt and three 2/Lts from the 26th.

Like many of you, I have had my share of lean flying for all the various reasons: No money, no gas, no parts, Pentagon, behind a desk, aircraft groundings, etc., but whenever I got a flight, I always managed to get some instrument time. When I logged hood, I tried to work as hard as if I were landing at Naha in the rain or Misawa in the snow with GCA off the air and a green wingman with no radio and both of us on fumes. When it was actual weather the incentive was built-in.

Tours in several fighter units over the years, plus a four-year stint at the Instrument Pilot Instructor School (IPIS) taught me a lot about flying in general but one observation stands by itself. With few exceptions, the best instrument pilots I have known were the best all-around pilots. If my hypothesis is correct, the prime reason was that all of their flying was instrument flying and they worked at it constantly. They used *an* attitude indicator (AI) for every phase of flying. Notice I used the word "an" rather than "the." To illustrate: The flight lead became an AI as did the rag, the panel or dart, the runway, the terrain, the horizon or the tanker. Corrections to any of the above are like correcting to a desired instrument course, normally small, but certainly coordinated and smooth. All kinds of benefits accrue: Wingmen appreciate it; the boomer's blood pressure stays within limits as does your WSO's; you get there with more gas, and, I guarantee your weapons scores will improve, particularly if you are not flying as much as you would like, and few are these days. One caveat, the finest instrument pilot in the world won't hit the target if you're out of range and/or the pipper isn't on target.

Over the years ATC—to save money—has had to cut a big chunk of flying hours out of the program. Undoubtedly instrument time was part of the cut. IPIS also bought the farm for budgetary reasons. Simulators took up some of the slack but to what degree would be conjecture and open to debate. I predict that in the future we will be forced to increase the hours in the pilot training program and that some form of IPIS will be reinstated. If we don't have the money to properly train *enough* pilots—maybe we need to train *fewer* pilots—*better*. We need to stop reinventing the wheel. In the long run it saves us so much money the business goes bankrupt.

An hour or even ten minutes flying basic instruments, exact airspeeds, altitudes, and headings or an extra GCA/ILS when fuel permits may not be exciting but is a competitive challenge and I always thought that the single word, competitive, best described the fighter pilot role. If you think I'm blowing smoke, ask the Edsalls, the Priesters, the Falls, the McPeaks, or their counterparts in your outfit.

As a final bonus for all, not just the fighter guys, the extra practice may make the difference between a normal IFR landing and a smoking hole—or in years to come—the opportunity to write about how it used to be. Try my theory. It isn't a cure-all but it will work for those who work at it *regardless* of age, rank or experience. ■

NEVER AGAIN

MAJOR GARY L. STEVE
33rd ARRS/DO
Kadena AB

"A good pilot learns from his mistakes—a lucky pilot survives them."

■ My licensed flying career began with the fulfillment of both parts of that axiom, and if there is any such thing as "luck," I had it.

The situation began innocently enough, but rapidly got worse as inexperience and ego took their toll. There I was, World's Greatest Private Pilot, with a brand new ticket and 40 hours of experience, ready to dazzle the world with my skill and cunning. Actually, it wasn't the whole world I was ready to dazzle; just my college roommate and two other friends from school, but that was still enough to almost kill all of us before the morning was over.

I had taken virtually all of my training as a student in a fleet of venerable Piper Colts, two-seater versions of that fabric-covered marvel of aerodynamic brickwork known as the Tri-Pacer. Besides a notable absence of nav/comm gear, flaps, and a number of other modern-day "necessities," the Colt had a brake handle located beneath the panel, instead of toe brakes. Therefore, for most of those 40 hours, I had pulled a handle instead of stepping on rudder pedals when I wanted to slow down or stop on the ground. That set up opportunity number one for disaster.

Opportunity number two lay in the fact that I had never really had to abort a takeoff in so simple a machine as the Colt, and was therefore spring-loaded to the "TAKEOFF" position when I took the active.

Opportunity number three was the result of taking all my training in an aircraft with no center of gravity or weight problems. A Colt's cabin would hardly hold enough besides the two passengers to exceed weight or CG limits. Add to these circumstances the fact that all my flying had been from relatively long runways and the stage was set.

The momentous occasion of carrying my first passengers was to take place in the "big" machine, a Cessna 172 Skyhawk. Having been thoroughly checked out (supposedly) the day prior, little remained that morning but a quick preflight and a leap into the blue with the three other would-be aeronauts. Looking back now, the sequence of events scares me, but at the time I felt supremely confident that everything was being done just right.

It had rained the night before, but the morning dawned clear and hot. Add a soft sod strip as disaster element number five.

Confidently, I cranked the engine and began taxiing to the uncontrolled active, performing my preflight checks in a thoroughly professional manner—except for omitting a little work in the performance charts, that is!

Nobody was in the pattern, so nothing remained but to turn into the wind and slip a surly . . . etcetera. The 172 literally lumbered down the strip at first, feeling very sluggish. A quick check of the gages confirmed that everything was in the green, so I wrote off the poor acceleration to the three football players and the full fuel aboard, plus the effect of the soggy surface from the rain the night prior. I felt secure.

As Cessna 172 operators can attest, 3,000 feet of runway near sea level, even with a loaded Skyhawk, provides an enormous margin of safety over critical field length. Most will also attest that, if still firmly planted after 2,000 feet of takeoff roll along a runway only 500 feet above sea level, the thought of aborting the takeoff would have long since come to mind. Not to me, though. I still felt secure. The departure end of the runway I was using was marked by a strip of trees about 30 feet high but only about 50 feet deep and forming a solid boundary across the west side of the airport. I was watching those trees approach with ever-increasing alarm now, and was feeling considerably less secure. Realizing far too late that there was too little runway remaining to safely abort, I determined that the only way out was up.

I may have been ignorant, but I wasn't stupid. Even I knew that the aircraft would accelerate more in the remaining thousand feet or so if it were airborne rather than dragging its gear through soggy sod. I managed to force it into the air the first time, but the airspeed was so low that it just fell back to the runway instead of climbing. That meant that more precious runway was used up while I accelerated to flying speed and eased back into the air.

On the second try, I succeeded in maintaining slow flight instead of a

NEVER AGAIN continued

high-speed taxi, and the airspeed indicator began to inch toward climbout speed. But the treeline was not inching toward me; it was rapidly filling the whole windscreen! In a heart beat, I properly analyzed the situation as critical (the first time of the morning that I was abreast of the situation). With even **my** basic understanding of aerodynamics, I realized that I could not accelerate enough in the remaining clear airspace to make it over the trees without stalling. For reasons I've been unable to explain except in the context of theology, I suddenly thought of the flap handle between the seats; something I wasn't used to having in the Colt. With the proverbial runway behind me and airspace above me, I resorted to the illogical—and it worked. With only seconds to go before impacting the trees and barely above stall speed, I pulled up on the flap handle for all I was worth. For the first time since turning onto the active runway, I was looking at something besides that treeline!

Those of you who have more than 15 minutes of classroom time in basic aerodynamics are already getting a picture of the sequence of events that followed. Almost instantly, the wallowing 172 literally popped to about 50 feet in the air while the airspeed indicator just as quickly began to unwind toward stall speed with those barn doors hanging behind each wing. But not to worry. Beyond that narrow strip of trees was the most beautiful, level, clear pasture I have ever seen before or since that day. With the obstacle behind me and smooth ground before me, I nosed the machine over and actually touched down momentarily while partially retracting the flaps. The aircraft began to accelerate and finally began to climb.

Needless to say, I climbed only high enough to establish a downwind pattern and aimed immediately for the runway. Four thoroughly shaken people and three thoroughly unimpressed passengers deplaned after I taxied back to the ramp. There was a postscript to this fiasco, though, that may make the strongest point of this whole confession. As I stepped shakily to the ground from the cockpit, I noticed a very strong radiation of heat from the brakes. Checking the other side, I found both brakes to be overheated. If you remember my reference to the absence of toe brakes in the Colt, you've probably already solved the mystery of the 2,000 foot takeoff roll; I was trying to make a maximum gross weight takeoff with my feet on the top part of the rudder pedals!

Now, you may say that you would never do anything that dumb, but I caution you to learn from my experience in this respect; any time you change from one kind of machine to another, there are going to be differences in procedures, switch locations, and limitations. Note them during checkout and take particular care to keep the differences fresh in your mind. Secondly, know what ought to happen every time you take the active for takeoff, or line up on final for landing. Even with the simplest aircraft, know what is normal and abnormal performance. Thirdly, DON'T HESITATE TO ABORT EARLY AND AVOID THE RUSH IF IT DOESN'T LOOK RIGHT!

I've managed to survive more than 2,900 flying hours since that fateful day 12 years ago in north Mississippi. I've flown supersonic trainers, jet transports, prop-driven transports, and a mixed bag of helicopters in the meantime for Uncle Sam's Air Force. I've had ample opportunity to make similar mistakes on a far grander scale since then, but it appears (so far) that I got enough education in that one takeoff roll to keep me thinking and looking for a long, healthy lifetime. I hope sharing my experiences will contribute to the same for you. ■

BLACKBIRD REUNION

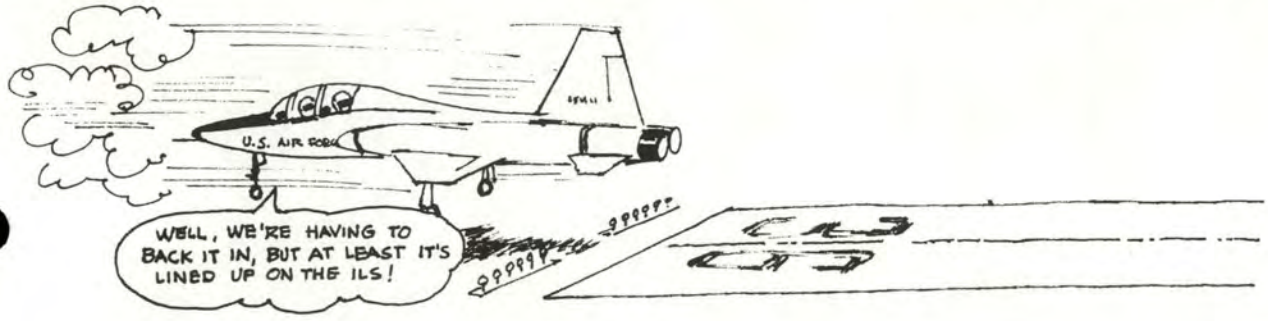
A Blackbird Reunion for all associated with SR-71 and U-2 programs, is slated for 15, 16 and 17 May 1981. For Blackbird Reunion/banquet reservation and information write:

Blackbird Reunion
C/O 9 SRW/CCE
Beale AFB, CA 95903
(916) 634-2692

Tune and.....!

MAJOR JAMES S. ELDER
Chief of Safety
Wright-Patterson AFB, OH

■ How many pilots can properly complete the title of this article? Probably 100 percent. How many actually use this procedure *every* time? As in many other areas, the pilot has the opportunity here to stop a series of events which could end in catastrophe.



"Fuzzy 24, turn left 030, intercept the localizer, cleared ILS approach runway 36." Sound familiar? Sure. Radar vectors to an ILS. Probably the most common method for transitioning to final approach. Unknown to the pilot, our sequence of events has already begun. Half an hour earlier the ILS was taken down for maintenance. Tower informed approach control that the ILS would be down for an indefinite period. Then Murphy entered the picture. Shift change. The new controller was not briefed, and subsequently cleared the aircraft for the ILS approach. "What's the problem," you ask, "certainly the pilot won't fly the approach with off flags in view." Not true. There is a problem. The sequence continues.

The pilot tunes the ILS and sets up the final approach course in his HSI. Off flags disappear from view. The headset emits a series of dits and dahs. Everything looks good except for one thing. The CDI is displaced to the left (behind the aircraft). Apparently, the aircraft has overshot the final approach course. The pilot forgets any thoughts he may have had about positively identifying the ILS, and begins an immediate left turn to intercept. A small intercept is applied for the one dot deflection. Approaching the final approach fix (identified by DME) the glide slope indicator appears erratic and the pilot decides to use localizer only procedures. Descent is begun. The CDI continues to drift to the left, and the pilot applies more and more left correction.

There are many ways this scenario could end. It actually happened recently, just as described above. The pilot became suspicious when the CDI deflection reached full scale and a thirty degree correction was having no effect. He leveled off at approximately 500 feet, broke out of the clouds and noted the runway at two o'clock. A safe landing was accomplished without further incident.

What happened? Why were the off flags out of view? Why were the instruments giving a believable indication? Murphy again! As with many of our runways, this one had an ILS for both directions. If you haven't noticed, the newer ILS installations of this type both operate on the same frequency. The only difference is the identifier. The equipment was designed so that both could not operate at the same time. In our case maintenance had turned off the active runway transmitter and turned on the opposite direction transmitter. The aircraft was receiving a good signal. But since it was coming from the opposite direction transmitter, CDI indications were reversed and actually directed the aircraft away from the final approach course.

Admittedly, someone else must make an error before a flight crew is faced with this situation. We all know that most accidents result from a long sequence of events. Quite frequently, the aircrew member has the last chance to stop this sequence. Unfortunately, he also has the most to lose if the sequence is not broken. ■

Born To Fly Low

MAJOR MICHAEL T. FAGAN
Directorate of Aerospace Safety

Oh, I have stripped the gears
of common sense
And flailed the sky with
untracked rotor blades.
Bug-like I've climbed, and
cleared the airfield fence
By thirty feet! . . .

Anon. (Fortunately)
With sincere apologies to
John Gillespie McGee, Jr.

■ It's a well-known fact that helicopter pilots are different. Walter Cronkite wrote a delightful article by that title. A hundred hack poets have written parodies on "High Flight," the worst of which is quoted above. Even Andy Rooney took a cut at the poor "rotor head" in a recent syndicated article alleging (probably correctly) that helicopters aren't completely invented yet. You have only to look at them to know that something is wrong. Let's face it . . . the only time an H-53 looks good is from the bottom when you *really* need a ride out of wherever you are.

Remember the good ol' H-43. Probably not. It was the one so well described as "two short flight engineers standing on a conex box, dueling to the death with banana trees." Aha! Now you know the one I mean! And helicopter pilots? A distinctive lot. They are the ones who put their helmets on backwards with both visors down, to protect against bird strikes.

As you learn to fly the things, it rapidly becomes apparent that this is outside the realm of *normal* aviation. In the first place, the aircraft commander sits on the wrong side. And then, you push the nose down to take off and climb. A normal landing requires more power than level flight, and the darn things stall if you go too fast. (That's around a blazing 100 KIAS sometimes, for you non-initiated.)

In addition to the specialized vocabulary associated with fixed-wing flying, helicopter pilots use such arcane delights as swash plate, cyclic, collective and BIM. How about the aeronautical playgrounds of translational lift, autorotation, and blade stall, not to mention power settling. Or the sanctity of special VFR? To fly is super-human . . . to

To fly is super-human . . . to hover, divine

hover, divine.

Why is it, then, that when I tell another pilot what type of aircraft I fly, he usually mutters a soft "oh" and won't look me in the eye? It's like I had just told him I was suffering from a terminal social disease.

All of this came home to me just this morning as I was walking down the hall, eavesdropping on the first-cup-of-coffee conversations from various offices. Some of the supersonic go-fast gun shooters and bomb droppers were talking about a high-low-high profile, whatever that is. In the helicopter business it would be a low-lower-low profile, I suppose. (Can you imagine a helicopter pilot maintaining a "low profile" flight level 250? Not for us. Most rotor heads get a nosebleed at flight level 025. FL 007.5 is about right for me.

All of this has an impact on flying safety. (It's hard to use "impact" and "safety" in the same sentence.) Low flight is a special realm, requiring special awareness and care, "Inadvertent contact with ground or water" remains a common bottom line in accident reports. It's hard to make inadvertent contact with the ground from 25,000 feet AGL! It's easier to hit the weeds from down in the weeds. That's where we helicopter people spend the majority of our flying lives. Relative to the high flyers, that is.

But not always! Sometimes the other guys (and gals) come down to our level. Take, for example, a recent "birdstrike."

A large, normally high altitude, multi-engine aircraft was over the flat Southland doing some low level testing. While maneuvering, a "thump" was experienced and the crew decided that it was a birdstrike. They proceeded home (a goodly distance . . . about three days by helicopter) and discovered minor damage about 20 feet inboard of the wing tip.

Well, it may have been a birdstrike, but if it was, the bird was roosting in a sugar pine tree when it happened. Or at least the bird was carrying a large branch. The bark and green needles proved it.

In the speculation that preceded the final report, some interesting thinking emerged. From the cockpit of an aircraft with limited forward/downward visibility, how do you judge your altitude? From the altimeter, of course. How about if your operation is limited to, say, 100 feet AGL? (A little slope can eat that up in a hurry!) Why, use the radar altimeter, naturally!

If the pilot descended to an indicated 100 feet AGL on the radar altimeter, actual altitude would be further reduced and "inadvertent contact" would become a nearer and nearer thing.

And what does the radar altimeter tell you? The approximate distance between the radome and the first reflective object on the *extended vertical axis of the fuselage*. If the aircraft previously described as experiencing the "birdstrike" had an accurate radar altimeter and was flying at an indicated 100 feet AGL but was over some 40 foot pine trees, it was not actually 100 feet AHO (Above Highest Obstacle). If the aircraft was in a bank, it very possibly had some part of the airframe (the wing tip) well below the level of the radome. In addition, the radar altimeter would be reading slant range—higher than actual altitude. If the pilot descended to an indicated 100 feet AGL on the radar altimeter, actual altitude would be further reduced and "inadvertent contact" would become a nearer and nearer thing.

Consider some actual numbers applied to the H-53. Let us propose

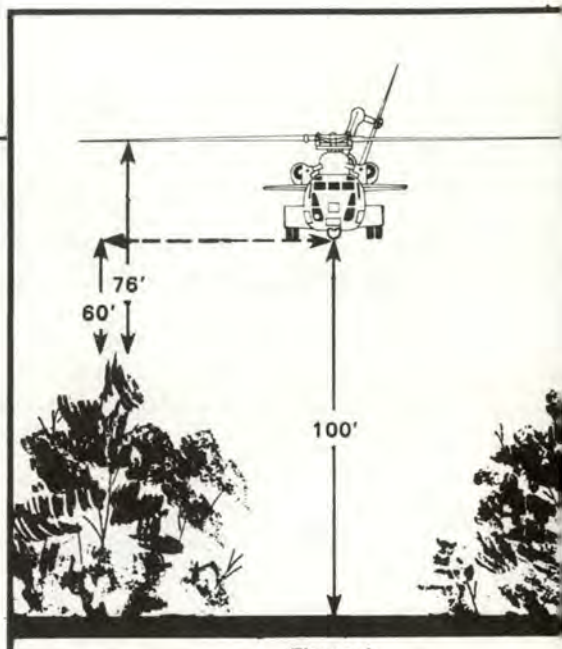


Figure 1
Level Altitude

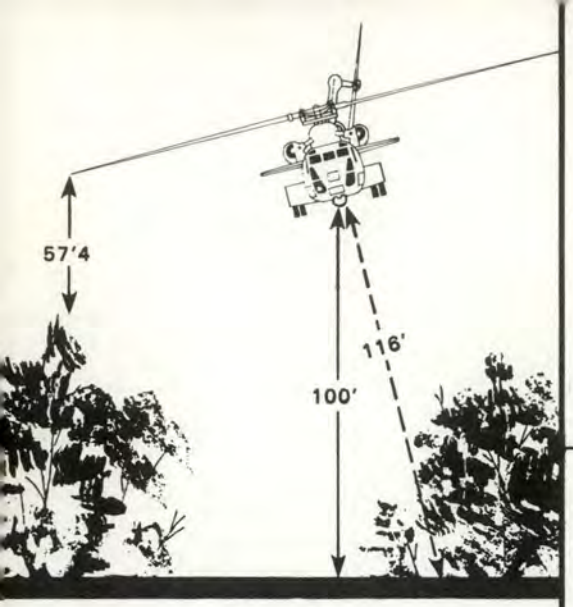


Figure 2
30° of bank

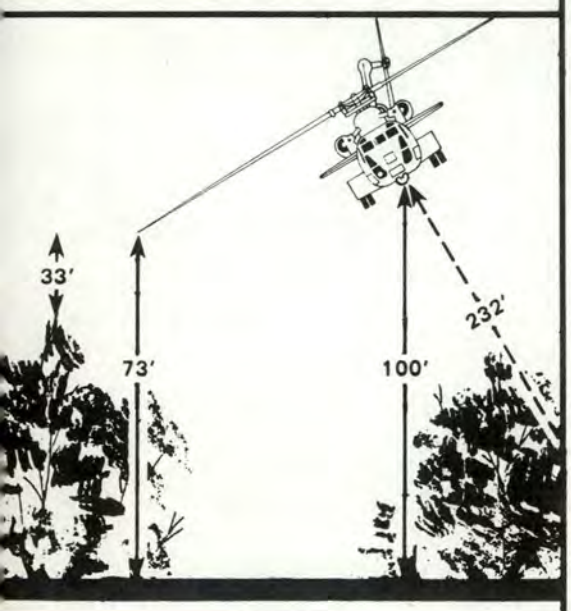


Figure 3
60° of bank

a Big Jolly on a Red Flag SAREX over wooded terrain. (Now you *know* this is a hypothetical case. Ever see wooded terrain at Red Flag?) Figure 1 represents the aircraft in level flight, indicating 100′ AGL on the radar altimeter. Actual altitude above the trees is 60′ to the radome, 67′ to the pilot's eyes, and 76′ to the rotor blades. (Assuming no coning, for you nit-pickers.)

If the aircraft is in a 30° bank (Figure 2), the radar altimeter will

Born To Fly Low

continued

indicate a comforting, but inaccurate, 116′, but the rotor blade tip path is now only 58 feet from one of those "bird strikes."

If our highly motivated rotary wing aviator is a true tiger, he might stiffen up the bank to 60° (Figure 3). Now his radar altimeter tells him he is 232 feet AGL, which is way too high for a tiger. His actual altitude is still 100′ at the radome but the tip path is now only 33 feet from the trees. Now, the pilot knows that there is such a thing as slant range. It was actual altitude plus 16 feet at 30° and will certainly be more than that at 60°. Maybe twice as much. So, he adds a 50 foot pad to his 100 foot minimum, which he thinks is too high for a tiger anyway.

With a few (about 2) unfamiliar Gs on the airframe, it is easy for a pilot to let his machine descend a little bit. With 150′ indicated on the radar altimeter, his actual altitude is about 65′ at the radome. The low edge of the tip path is actually 38′ above the turf and 2 feet below the tops of the hypothetical trees. Why doesn't the pilot see it coming? The tree strike will occur about 20 feet behind the pilot and nearly 30 feet below him. If he is keeping his head up, he is looking forward and up, relative to his aircraft axis, so that he can see where he is going.

That the incident which inspired this refresher course in trigonometry involved a fixed wing aircraft brings up another vital point. While the ultra-low level structure is our (helicopter) native environment, it is not exclusively ours. The big fellows and the fast fellows occasionally intrude, especially during exercises. In the many motor designs, especially, visibility is relatively restricted. Added to that, those guys don't have much practice at seeing and avoiding helicopters that pop up from behind the same ridgeline they are popping over. I know of one helicopter pilot, forever unnamed, who got an unforgettable head-on view of an A-10 while he (the helicopter pilot) was terrain masking in a nice deep, but somewhat narrow, canyon. Actually, they were both terrain masking and both had legal altitude under them. This same helicopter pilot, by the way, learned about radar altimeters and trees when he came home from a SAREX with leaves in the left gear well, although he had never been under 200′ indicated. Fortunately, there was no damage in either of these learning experiences.

The point is, fellow helicopter pilot, that two solid objects cannot occupy the same space at the same time. That includes rotor blades and the earth, or objects affixed to it, like trees. It also includes other aircraft. It must be remembered that what goes up, must come down. No matter how far it goes up, it must come down through the airspace which we feel is ours. If it, (or we) get lower than a nearby obstacle, there will be a mishap. Sometimes we set ourselves up for such an event by not knowing how low the lowest part of our machine is.

Watch out! ■

OPS topics

A Near Miss

■ An airline recently reported this incident.

"The plane was all fueled and ready to go. I was on the headset. I requested 'brakes off, beacon on' as a normal procedure. It was done and push back was completed. At this time, I told the Captain to park his brakes. He did so. I then disconnected the tow bar and flagged the tractor driver away. As normal procedure again, I got under the plane and began to connect the torque link. By this time, the Captain had two engines started and was ready to taxi (he notified me of this). I was busy connecting the torque link so I didn't acknowledge his notification. The moment I finished connecting the torque link (and while I was still under the plane) I heard the rpm of the engines rise tremendously and the plane began to taxi. I quickly jerked my foot out of the way of the nose wheel, snatched the cord out of the jack box and ran from beneath the plane with the main wheels coming close to running over me. The electrical power door was still open with the wands inside it, and the crew taxiing to the runway. . . ."

That mechanic was lucky. Flight crews should never move out until directed by the marshaller. If you always remember this, you won't run over any of the ground crew.

Flying the Gages

Weather remains an important factor in our operations. We get better at handling bad weather, with more crew knowledge and skill and better equipment. Even so, some lose. Experience tells us that low flying time in the past 30 days often precedes a weather-related mishap. In fact, all seven pilots involved in instrument/weather related mishaps last year had flown less than 13 hours in the preceding 30 days. If that tells us anything, it says high instrument proficiency is the name of the game in bad weather. (See Needle, Ball and Airspeed . . ., page 4, for more on this subject.)

Switching

All fighter pilots scare themselves sometime during their flying careers. I'd like to pass on an American's experience and its lesson:

"I was on a combat tour in the Far East. The strafe target was a red-tiled hooch located in a clump of trees which was surrounded by a rice paddy. I didn't see the hooch on the first 2 passes and neither did my flight lead. We were using steep dive angles in an effort to see through the trees. I was determined to find that hooch. I was really pushing trying to do well. At about the time I should have squeezed the trigger, I caught a glimpse of red tile short of my aiming point. I readjusted, shot and began my recovery. It was then I realized that I was in trouble. I made it but I was flat lucky. I didn't come close to hitting the target either."

In another incident the pilot of a CF-104 was making 10 degree attacks. After beginning an attack on the wrong target, the pilot realized his error and switched. At release, the aircraft was 500 feet too close, 300 feet too low and 5 degrees too steep. He missed the target but not the ground. The gun camera film preserved a complete account.

If you find yourself switching targets, it's time for you to switch modes—from ground attack to going around. You are not going to hit the target. However, your chances of hitting the ground are much greater.

Bombs are smarter than pilots—they always know that they will hit the ground! Courtesy OSTRICH—38th Group Flight Safety Digest, RAF.

continued on page 28

X-COUNTRY NOTES

MAJOR DAVID V. FROEHLICH
Directorate of Aerospace Safety

ERA ENDS

■ For almost 25 years, a group of professional and dedicated Civil Service folks were responsible for top-notch transient maintenance at Tyndall AFB, Florida. As of 1 December 1980, this group was disbanded, and the function was taken over by contract personnel. Mr. Dennis Britt, former supervisor of the Tyndall TA team, was the mainstay of an outstanding training program which kept the entire TA crew ready to handle any of the myriad of different aircraft of all services and nations that stopped at Tyndall. In addition to the normal gas-stops and RONs, the Tyndall team provided outstanding support for numerous TDY aircraft, exercise forces, deployed units and especially William Tell competitions over the years. They also handled the Queen Bee commitment for all USAF T-Birds East of the Mississippi.

That was a well-trained, highly motivated professional group of "servicers and maintainers." Their attitudes led to fast, yet safe aircraft turns and "problem-fixes." Their contribution to the overall USAF transient effort will be missed, but we wish the new team the best of luck. They have some large shoes to fill!

INTEREST ITEMS

271 NEWS—Two years ago, as we wandered through airfields, we usually found 271XX manning to be suffering from a shortage as well as an experience void. The picture is now more encouraging as we find at least 95% of the bases we visit have the correct number of authorized bodies. Many of those bodies are still new or fairly inexperienced folks, but at least the numbers are there. The training is progressing, attitudes are positive, and the majority of new arrivals are highly motivated toward their new career field. I admit to prejudice, but I agree—I feel that the 271 career field can be one of the most interesting and challenging in the Air Force. It offers an opportunity to be involved with the heart of airfield operations, deal with a complete cross-section of base personnel and organizations, and often carry a level of responsibility much higher than normally given to individuals at such early stages in their careers. Hang in there—271s—end commercial.

TA NEWS—A couple of items that popped up on recent trips. Marshallers still need to have some feelings for the folks in the cockpit. Make sure you are able to be seen (wands, paddles, reflectorized whatever); make sure you're in the right place (where the crewmember taxiing can see you) and please watch the proximity of other objects (stands, extinguishers, carts, trucks, etc.) The subject came up when we were taxiing into a very dark ramp, with a light drizzle and only one TA person to drive the truck and then marshal! The visibility was low and the nervous factor high because of all the dark-shadowed images looming up to grab my wingtip. The marshaller looked disgruntled because I barely creeped into the slot. Have some sympathy!

On the other hand, I'd like to throw small stones at some crewmembers! If you don't take the time to adequately explain a write-up or servicing request, you've got no gripe coming when you return to the machine and are surprised by fuel load or open discrepancy. TA folks—make sure the crew gives you all the info you need before they get away. If you are not absolutely checked out on the particular machine, let the crew know that you need assistance.

BASE OPS—This past trip out we found numerous out-of-date FLIP pubs and charts. Especially important are those under plastic, 'cause they are used by crews in a hurry, and often the date won't be checked. Crews—again a plea! Don't swap or steal the books from the flight plan area. Ask at the counter and they will spare what they can to help you.

NEW ADDITIONS

AVIANO AB—Kudos were given to the attitudes of all concerned. Especially service-oriented were the TA folks and Base Ops personnel.

For many years, the Tyndall TA team took excellent care of the venerable T-Birds as well as all other aircraft.

This type of interest is the key. Welcome to the list!

BITBURG AB—Another place with a plus attitude. Base Ops and billeting personnel and facilities were cited as excellent. Keep up the good work!

NO CIGAR!

BASE X—We landed and were parked by one TA person who threw chocks at the wheels so he could run and marshal in a Thud next to us. The Thud was in a hurry and two other aircraft arrived in the next ten minutes—the same individual was trying to do it all. Not his fault, but nobody got good service—supervisory problem! Motor pool driver was practicing for Indy 500 on the way to the "Q" and didn't even have the sense to wear the seat belt.

BASE Y—We checked in at the billeting office about 2000 hrs. The somewhat surly clerk gave us two keys and we hoofed it over to the rooms. Upon opening the doors, we found both rooms occupied. We trudged back to the office and the still surly clerk gave up two keys to "the VIP quarters because that's all I have left." Another ½ mile back to the rooms only to find them also occupied—this time by some fairly irate D.V.'s. Stomped back to the office! This time the somewhat sheepish clerk admitted he really didn't know who was where, and he would give us the key to the other VIP suite, but he wasn't sure it was made up. The third time was a charm, but we had burned an hour of crew rest, and by now there was no place open to eat. . . .

BASE Z—The T-39 is not a particularly complex aircraft to service, but these TA folks almost did us in. As the refueling progressed, apparently the left wing wasn't venting (a check item) and soon the aircraft lurched violently over on the right wing. Without two or three folks hanging on the left wing, the 1,600 lb imbalance might just have tipped the aircraft over before the left wing could have been filled. Apathy or incompetence—take your pick! Later, the transport driver also gave us a speedy, no belt trip across the base after we had waited 45 minutes.

We're still working toward the goal of having only the best of the best on the list! Inputs from all sources are great. We watch the files and look for trends on certain items at a base. Good turn or bad—let Rex know! Send your comments to Rex Riley, AFISC/SEDAK, Norton AFB, CA 92409. ■

REX RILEY
Transient Services Award

LORING AFB	Limestone, ME
McCLELLAN AFB	Sacramento, CA
MAXWELL AFB	Montgomery, AL
SCOTT AFB	Belleville, IL
McCHORD AFB	Tacoma, WA
MYRTLE BEACH AFB	Myrtle Beach, SC
MATHER AFB	Sacramento, CA
LAJES FIELD	Azores
SHEPPARD AFB	Wichita Falls, TX
MARCH AFB	Riverside, CA
GRISSOM AFB	Peru, IN
CANNON AFB	Clovis, NM
RANDOLPH AFB	San Antonio, TX
ROBINS AFB	Warner Robins, GA
HILL AFB	Ogden, UT
YOKOTA AB	Japan
SEYMOUR JOHNSON AFB	Goldsboro, NC
KADENA AB	Okinawa
ELMENDORF AFB	Anchorage, AK
RAMSTEIN AB	Germany
SHAW AFB	Sumter, SC
LITTLE ROCK AFB	Jacksonville, AR
OFFUTT AFB	Omaha, NE
BARKSDALE AFB	Shreveport, LA
KIRTLAND AFB	Albuquerque, NM
BUCKLEY ANG BASE	Aurora, CO
RAF MILDENHALL	UK
WRIGHT-PATTERSON AFB	Fairborn, OH
POPE AFB	Fayetteville, NC
TINKER AFB	Oklahoma City, OK
DOVER AFB	Dover, DE
GRIFFISS AFB	Rome, NY
KI SAWYER AFB	Gwinn, MI
REESE AFB	Lubbock, TX
VANCE AFB	Enid, OK
LAUGHLIN AFB	Del Rio, TX
FAIRCHILD AFB	Spokane, WA
MINOT AFB	Minot, ND
VANDENBERG AFB	Lompoc, CA
ANDREWS AFB	Camp Springs, MD
PLATTSBURGH AB	Plattsburgh, NY
MACDILL AFB	Tampa, FL
COLUMBUS AFB	Columbus, MS
PATRICK AFB	Cocoa Beach, FL
ALTUS AFB	Altus, OK
WURTSMITH AFB	Oscoda, MI
WILLIAMS AFB	Chandler, AZ
WESTOVER AFB	Chicopee Falls, MA
McGUIRE AFB	Wrightstown, NJ
EGLIN AFB	Valpariso, FL
RAF BENTWATERS	UK
RAF UPPER HEYFORD	UK
ANDERSEN AFB	Guam
HOLLOMAN AFB	Alamogordo, NM
AVIANO AB	Italy
BITBURG AB	Germany

THE WOES OF GETTING STOPPED

Or, Any Landing You Can Walk Away From Is A Good One

■ In aviation, the second most important thing to getting going is being able to stop when, where, and how you want. How often have you heard the saying, "I can stop on a dime and give you a nickel change?" Well, inflation must be affecting the flying business because in the first 8 months of 1980, there were 72 landing mishaps involving the pilots' inability to land and stop their heavier-than-air machines in a dignified manner.

The reasons for these landing anomalies are various and sundry. Many of them are the kind that we, as pilots, tend to blame on the maintainers: Antiskid failed, drag chute did not deploy, loss of hydraulic pressure, tire blew, dragging brake, and on and on it goes. But, there were also others—the pilot-induced or the pilot-preventable type. The ones that are extremely embarrassing at the time of occurrence and generally turn into war stories at the bar some time later. The type that attract unwanted attention and notoriety, which generally diminish in direct proportion to the time elapsed from the last occurrence. In other words, the type that should never have happened in the first place. Following are a few examples which illustrate my point.

The pilot landed behind another aircraft at a faster than normal speed. Because of his high airspeed, he performed minimum aero braking. He perceived that he was rapidly closing on the aircraft ahead of him, applied excessive braking and blew both main tires. Fortunately, he was able to maintain directional control, did not depart the runway nor hit the other aircraft.

A passenger-carrying aircraft landed on speed 1,500 feet from the threshold on a very wet runway. Light braking was attempted, and the aircraft began to drift to the left. The pilot ceased braking and applied right rudder and aileron to correct back to the centerline. As he approached the runway center, he applied opposite flight controls, and sure enough, the aircraft slowly went to the left. At about this time, it was decided to engage nose wheel steering for more positive directional control. Right rudder initially effected a correction towards the centerline, but when a left correction was applied to track down the centerline, the aircraft continued easing toward the left side of the runway; heavy braking did not prevent the aircraft from departing the edge at about a 30-degree angle and coming to rest in the mud.

A transport-type turboprop was intentionally landed a little to the left of the runway centerline due to a slight crosswind. After about 500 feet of ground roll, the aircraft veered right. The pilot applied full left brake, left rudder and reverse pitch. The aircraft departed the runway at about the 1,500-foot point and continued parallel to the runway

Wet runways continue to take their toll of USAF aircraft. A successful landing in such a circumstance depends on the pilot's knowledge, skill and judgment.

MAJOR JAMES L. GELLISPIE, CAF
Directorate of Aerospace Safety

for another 2,000 feet. The number 1 engine was shut down, and the aircraft returned to the runway with about 6,000 feet remaining. Skid marks showed the aircraft in a 12-degree right slip condition while paralleling the runway; the number 1 prop struck the ground 40 times, and the number 2 prop chewed up the 7,000-feet remaining marker.

During a formation takeoff, the wingman started to fall back, noticed his right afterburner had not lit and quickly reselected. He regained position with both burners blazing just as the lead commenced rotation, at which time the right afterburner decided to blow out. Swiftly realizing it was not his day, the pilot elected to abort. The runway was 2 miles long which left ample time to stop the aircraft. For some inexplicable reason, the pilot did not utilize zero braking, and rather than a steady application of wheel brake pressure, he cyclically applied braking. The brakes overheated, and the aircraft took the barrier a little bit left of center.

Following a touch-and-go landing, the RSU controller told the pilot that his gear had not fully retracted and that he should lower the gear and make the next landing a full stop. The aircraft landed 1,000 feet down the runway and continued rapidly to approximately the 1,000-foot remaining marker. The pilot braked heavily; the aircraft drifted to the right side of the runway, and with about 350 feet remaining, the right tire blew. The left tire blew shortly thereafter, and the aircraft engaged the barrier in a left drift. The aircraft slewed to the left and slowly rolled inverted in the overrun. The pilot shut down the engines and egressed by using the canopy-breaking tool. Even though this arrival was particularly undignified, it pleased the engineer who designed the canopy-breaking tool—this was the first time it was ever used in anger, and it worked.

And, of course, no discussion of landing anomalies would be complete without the classic example: The aircraft touched down slightly fast and ballooned back into the air. With the aircraft properly configured and the throttles still at idle, the pilot at the controls promptly selected landing gear up. The aircraft commander immediately went to full power, took control, and heard the sickening sound of metal scraping the runway. That crew having just completed a minimum slide landing . . . you can imagine the rest.

Notwithstanding the fact that many exciting things can happen during the landing, the outcome ultimately comes down to the pilot. The success or failure of flight termination depends on the guy at the controls, his technique, knowledge, judgment, and ability to cope with the situation. A calm, cool, calculating approach to each and every landing is one way of minimizing your exposure to embarrassment, or worse yet, physical pain. Know your aircraft, its limitations, the necessary procedures and anticipate that during your next takeoff, as well as landing, you may have to employ all of the above.

Avoid the sudden understanding of just how useless runway behind you really is, as you view the 10,000 feet of recently travelled surface from the overrun. ■

NEWS FOR CREWS

Career information and tips from the folks at Air Force Manpower and Personnel Center, Randolph AFB, TX.

AIRLIFT CROSSFLOW–An Increasing Desire Pattern

MAJOR PAT PATTERSON
Chief, Airlift/Helicopter Career Management Section

■ "I've been in C-130s since Pontius was a pilot—if I don't get a C-141 this time, I quit!" "If there's really a pilot shortage, why can't I crossflow from the C-5 to the C-9 to fill a vacancy?"

Sound familiar? If you're an airlift pilot, you already know what I'm getting at—you've either harbored the same thoughts, heard them at the bar, or possibly even expressed them yourself. It's certainly obvious from where I sit that the desire to crossflow to other airlift systems is becoming increasingly popular among our transport pilots. A recent AFMPC trip through the Pacific drove the point home for me. The numerous questions and comments we received were so heavily weighted toward crossflow opportunity among airlift systems that I've sought this forum to set the record straight—to sum up the pros, the cons, what we're doing now, and what the future holds.

The Pros

Contrary to what your perception may be, I don't know of any "old head" airlifters who don't recognize the benefits of crossflow. You can probably list them as accurately and with as much fervor as I; but at the risk of preaching to the choir, let me hit the top three.

The first and most obvious benefit is improved morale, which, in turn, improves retention. This one benefit alone is enough to justify some sort of crossflow program. But, let's not stop there. What's the next driving benefit? Career progression? You bet!

Those of you assigned to airlift during the consolidation of tactical airlift within MAC in 1975 saw the potential for career progression virtually double overnight. If you don't believe that, look around MAC headquarters right now, and you'll see the key staff positions fairly evenly distributed between tactical and strategic airlifters. It doesn't take a PhD in personnel management to see that experience in both the strategic and tactical airlift mission opens a multitude of career opportunities which may not be available to folks with a more limited or single-mission background.

The third benefit? It's career broadening—the practical kind with real utility downstream for our future airlift leadership. Let me explain. From a management viewpoint, crossflow helps create a pool of future airlift leaders who possess a broad, in-depth knowledge of the total airlift mission. If you've worked within the war planning business, you're well aware of the interface between strategic and tactical airlift during any of the major war plan scenarios. Force sizes, closure times, combat environment, aircraft capabilities, and limitations all come to play in determining what type aircraft provides the best airlift force for any specific mission. The man who has the responsibility to get us there "firstest with the mostest" has to know all our capabilities. How does he learn? By gaining as much first-hand experience across the total mission as possible—and that means crossflow.

The Cons

"Well," you say, "typical personnel approach—give us the reasons for doing it, then tell us why we can't." Well, don't pull the plug on me just yet, because there are two sides to every discussion. As much as we'd like to see substantial crossflow opportunities within airlift,

we have to temper our enthusiasm with some tough current realities. What are they? Decreased unit experience levels, limited training quotas, and insufficient cockpit seats/flying time, just to hit the high spots.

Every MAJCOM commander in the Air Force identifies a minimum level of experience he wants in his flying units and staff to get the job done. With force reduction and the high pilot attrition rates we have experienced during the past three years, we're hovering uncomfortably close to those minimums in several weapon systems. The fact is simple – we've been losing pilots faster than we can train and "age" backfills out of UPT to experienced status. Couple this with the programmed increase in UPT production over the next five years, and you can begin to see the problem – loss of experience off the top through attrition and a flood of new, inexperienced pilots at the bottom – driving experience levels even lower. Don't get me wrong! New pilot inputs are *essential* if we're to sustain a mission-ready force into the future; but, in the near term, they represent somewhat of a mixed blessing from the unit experience perspective. In order to take on pilots in sufficient numbers to overcome our current and projected pilot shortages, something must give elsewhere – and one of those "elsewheres" is our ability to crossflow. Why? Two reasons. Basically, we're physically restricted (by cockpit seats available) in the number of new pilots we can take into airlift, and fiscally restricted (through the budgeting process) by limited training/flying hours.

An optimal mix of new pilot inputs, training capability, and programmed flying hours would allow us to age and experience a pilot force somewhat in excess of our requirements for experienced people. If we had this optimal mix, we would be able to smooth flow pilots up through AC and IP qualification – and subsequently move them on to staff positions at a pace compatible with manning needs as well as most individual career aspirations.

Are we hacking it now? Well, we haven't established the track record we'd like. Due to the increasing numbers of new pilots and limited qualification training capacity,

we've had to look to the rated supplement and reduced rated staff manning for the reservoirs of experienced pilots needed to sustain the crew force and maintain acceptable experience levels in our flying force. An aggressive crossflow program at this time would compound the problem by further reducing experience in one system and increasing the inexperienced input into another, all at a time when virtually every available cockpit seat/training hour is badly needed to train, absorb, and age our increased UPT output. It's a bit of Catch 22, without a doubt – but it's a reality that we'll be facing until we get our inventory of experienced airlifters back into shape.

What Are We Doing Now?

Despite the drawbacks I've discussed above, there *are* opportunities available for airlift pilots to crossflow;

some you're already aware of, and some, perhaps, you're not. In addition to the most publicized (ATC IP Duty, 89th MAG, exchange programs, etc.), there is a continuing requirement for airlift pilots to crossflow to weapons systems which, due to the nature of the mission, either do not produce enough experienced pilots to sustain their own requirements, or require experienced pilots right off the bat. I'm talking primarily about the 58th MAS birds at Ramstein (C-140s, T-39s, C-12s), C-9s overseas, and a few T-43s at Mather. For the next few years, you'll also see a continuing requirement at the 15 stateside T-39 units—primarily for copilots, but we have been selecting a few ACs as allowed by our needs for experienced inputs.

The opportunity for crossflow that I'm quesioned about most frequently—C-130 to C-141/C-5 and vice versa—will continue to be limited for the foreseeable future. The reason? Projected experience levels in the C-130 and C-5 are too low to justify *more than a trickle* of crossflow to the C-141, especially at a time when C-141 manning is higher than any other system in the Air Force inventory. Conversely, training capability at Little Rock in the C-130 is programmed to be totally saturated with new UPT graduates, making it tough to handle any crossflow to the Herk from other systems.

What's The Outlook?

The outlook for the next two or three years remains about the same as it was for FY80—a very limited number of airlifters were able to crossflow despite the drawbacks I've outlined here.

How can you qualify for what might be available? If you're among those interested in crossflow opportunities, you need to stay abreast of what options are available and what the qualification requirements are. Give us a call and ask about the specific aircraft or location you're interested in. When's the next opening? What rank and year group are we looking for? What's our selection criteria for volunteers—time on station, overseas return date, flying experience, etc? How many volunteers do we have for the assignment? If we have something you're interested in, and you're qualified for this position, your next step—a most inportant one—is to submit a Form 90 reflecting your volunteer status.

I can't overemphasize the importance of a current Form 90. Don't rely exclusively on phone calls or your resource manager's "back of the envelope" notes. Several days or weeks may pass before he actually works your assignment and, if you've completed and submitted a current Form 90, you needn't worry that the system has "forgotten" your desires.

The airlifters who are going to be successful in crossflowing to another airlift system are those who know what is available, remain realistic in their desires, and keep their desires and Form 90 up to date with their resource manager. If you want to help increase your chances, start on the right track—give us a call and send us a new Form 90 to get the ball rolling.

Airlift Resource Managers: MPC—AV487-6818/6831;
MAC—AV638-4874/2287.

About the Author

Major Patterson is assigned to AFMPC as Chief of the Airlift/Helicopter Career Management Section. His background includes duty at HQ MAC (Command Briefing Team, War Plans Officer, and Executive Officer to MAC/XO), tours as a C-141 assistant Squadron Operations Officer/Standardization Officer, and a tour in SEA. ■

How Nice To Be ALIVE

COLONEL DAVID R. JONES, MC, CFS
Chief, Neuropsychiatry Branch
USAF School of Aerospace Medicine
Brooks AFB, TX

■ In a recent T-37 accident, the solo student died when, instead of climbing out after departure from the auxiliary field, his aircraft made a descending turn to the right and impacted nose down. Investigators found that he was not holding the stick at the time of impact, and also found full forward trim. I wonder . . . .

It was clear and a million on this autumn day in Turkey. As squadron flight surgeon, I was proud of "my" pilots, and particularly aware of the high level of experience in this gaggle of career TAC-trained errors. And the pilot I was flying with this day was as good as they come.

So there I was in the old back seat, clicking away with my trusty 35 mm as we zipped along over the rugged alternation of rocky escarpments and sudden gorges that were the main feature of this part of Southeast Turkey. As my memory has it, we were tailend Charlie in a flight of four, the usual position of the two-seater 'F', so that the ham-handed flight surgeon could practice his formation flying out where it was safe.

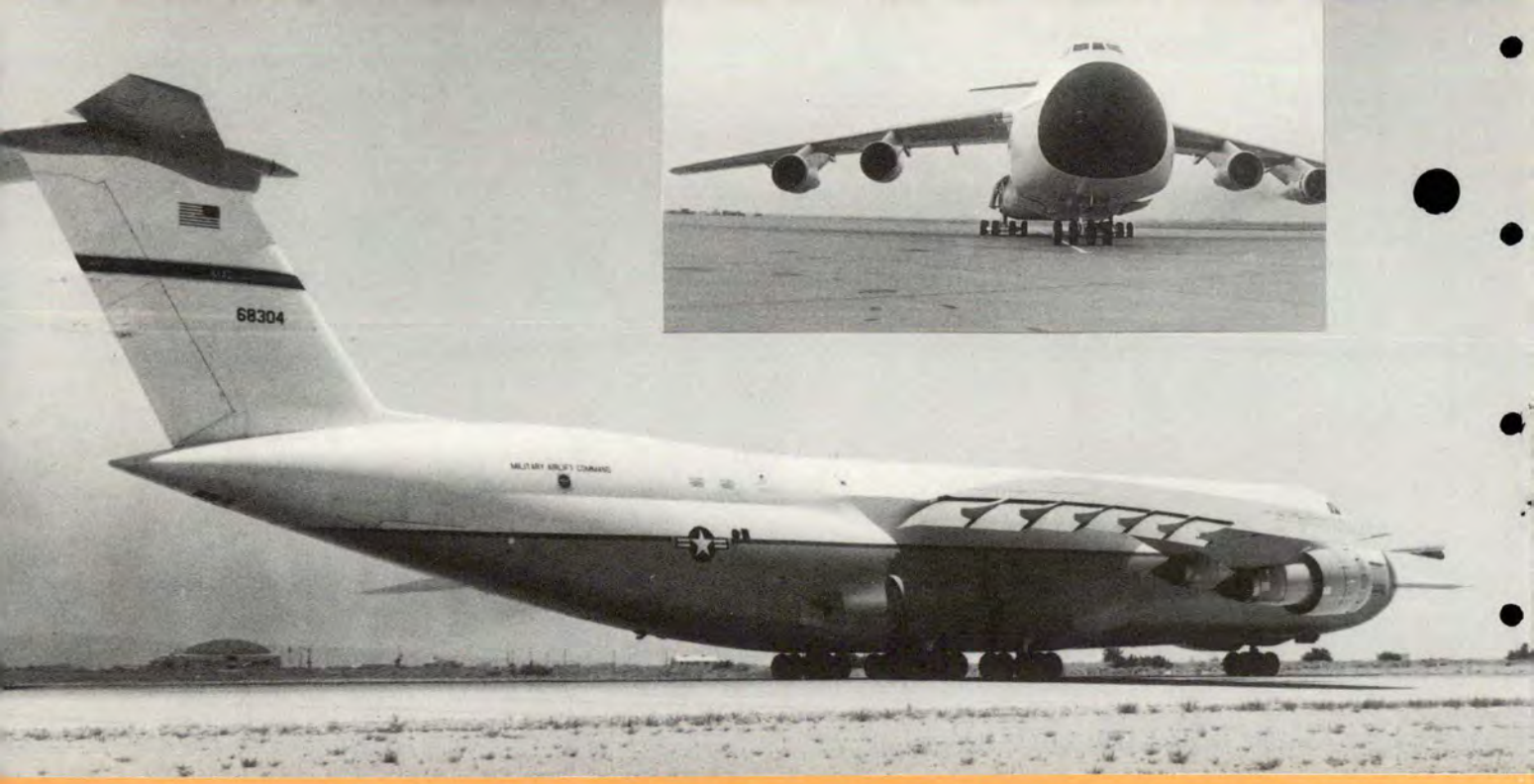
I'm not on the stick now, though. We're down in a canyon in extended trail, and I'm reaching for my camera to take some pictures of the rocky ridges above us on both sides. As I fumble with the lens cap, it escapes my gloved fingers and falls to the floor of the rear cockpit, rolling to the right. I mumble something to myself, lean forward, pick it up and WUHOOW! I'm glued into position by what feels like a four-G pullup! Pete has pulled back on the stick with a whole soul, and we're going close to straight up—I think. I'm looking at the floor, trying to keep my head from ending up behind the rudder pedals. And I'm *mad*—I've heard of this trick before, getting the other guy to lean forward and then locking him in position with positive Gs—but that's an initiation rite, sort of an aerial quest for a lefthanded wrench, and I've been flying for five years, definitely not a newby. What does he think he's doing?

After an eternity lasting at least five seconds he releases backpressure and I pull myself up, ready to hear his "Gotcha, Doc!" So I beat him to it: "What the hell do you think you're doing?" His answer takes all the fun out of the day. "We had runaway trim full down and left, Doc, and I wanted to get out of that canyon in a hurry. It's working OK now, but we're going on up high enough so I can turn it off if I have to without worrying about hitting something!" And, a little later, "I wonder what could make it malfunction all at once and then be OK again. You didn't touch it, did you?" "Not me, Pete, I was just getting ready to take a picture and leaned forward to . . . ."

The light dawned on us simultaneously. Telling him what I was going to do, I leaned forward again, this time with my left hand up beside my helmet. Sure enough, the trim button pressed my knuckle as I touched the floor with my right hand. I was amazed at the relative size of the helmet; my face was a long way from the stick, but the helmet swelled my head dimension two inches farther than usual. No doubt about it—the left side of my helmet had touched the trim button with just enough force to run it full left and down, and yet had touched so lightly that I hadn't felt the contact through the helmet.

Pete, if you're still around, do you remember that day? If it hadn't been for your strong right arm and your quick reaction, we'd both have missed a lot of fun in the last fifteen years. Thanks again! I learned that day never to move around the stick without warning the pilot, and always to guard my helmet with my hand when I had to lean forward. The sore neck I woke up with the next morning reminded me how nice it was to be alive.

I wonder. . . . That T-37 student wasn't doing well at all. He had, in the official phrase, manifested his apprehension by poor performance, airsickness, inability to concentrate, sleeplessness, loss of appetite, withdrawal from the usual relationship with friends, and in other ways that were clearly recognized after the fact. Was he fumbling around in the cockpit with maps or charts or plates or checklists after departure? Did he rest something on the stick? Did he drop something? Did he lean forward and touch the stick with his helmet? Did he fail to recognize what was happening? No way to know now. I guess all I can do is to let the rest of you know what almost happened to us. Fly safe! ■



No Guarantees

MAJOR KURT P. SMITH
Directorate of Aerospace Safety

■ What can you tell a pilot about taxiing that he doesn't already know? Probably not very much! Some pilots are not impressed by mishap statistics or tips on safe taxiing. It could be compared to trying to tell someone how to drive safely. The fact that most experienced drivers believe they know all there is to know about driving and that they never cause an accident, leads them to become complacent about safe driving. The same notion can sometimes be applied to pilots taxiing aircraft. The fact that some pilots believe they know all there is to know about taxiing and that they will never cause a mishap allows them to become complacent about taxi safety.

Unfortunately, each year a few learn the hard way by experiencing the pilots' most embarrassing experience— the taxi accident. No matter how many extenuating circumstances you can come up with, it is hard, if not impossible, to fully explain how you dragged the wing tip of your aircraft through the nose of another parked aircraft. The experience is embarrassing and has all the makings of being one you will never forget. Unfortunately, this method of learning (the hard way) is not the most cost effective way to eliminate taxi accidents.

The purpose of this article is to emphasize that no matter how hard the Air Force works to provide a safe taxi environment, it is impossible to say with 100 percent certainty that we have been successful. Try to remember, when it comes to taxiing, there are no guarantees!

A recent taxi accident involving two transport aircraft emphasized this point. The unhappy story goes something like this. The pilot was taxiing his large transport aircraft at a strange field. It was a rainy night with thunderstorms in the area. As he taxied out to take off, the pilot had a feeling that the clearance was going to be closer than it had been when he had taxied by the "same" aircraft the night before. As a precaution, he positioned a crewmember in the left window to monitor wing tip clearance and taxied to the right of the centerline. As he taxied by the parked aircraft, his left wing tip stuck its radome.

Although the mishap itself confirmed the lack of wing tip clearance, the investigators were left with the job of trying to determine why. As it turned out, the parked aircraft was not the same aircraft the pilot had taxied past the night before. It was another aircraft that was incorrectly parked well forward of the parking spot. Although many shared in the blame, the pilot found out that there are no guarantees when it comes to taxiing.

It shouldn't come as a surprise to anyone that the Air Force takes a dim view of taxi accidents and that pilots usually end up with the responsibility for the mishap.

Marshaller's directions may direct

you into another aircraft.

Aircraft may not be properly positioned on parking spots.

ALCE personnel may incorrectly mark parking spots.

Civil engineers may not design taxiways with enough taxi clearance for every situation.

These factors and many more yet to be discovered do little to lessen the pilot's responsibility for being the last chance to prevent a taxi mishap.

I'm sure if we were all-knowing and could have warned this pilot he was going to have a mishap, he probably would not have believed it. He probably would have been able to recite all the do's and don'ts of safe taxiing. He would also tell you the special pilot techniques he used to avoid a taxi mishap. But what happened?

Although the investigation zeroed in on human error, what were some of the intangible factors that may have influenced the pilot to make the error? Did his experience make him complacent? Was the drive to get the mission accomplished overriding good judgment? Did the pilot fail to pay attention to the details of taxiing in anticipation of going to go fly in an area of thunderstorms? Did he make too many assumptions? All these factors may have played a role in the mishap. Unfortunately, we will probably never really know what went on in the pilot's mind.

From a look at the mishap statistics, taxi mishaps make up only a small, but constant percentage of Air Force mishaps. For the last 20 years, taxi mishaps have made up about 1-4 percent of Air Force mishaps. This averages out to approximately 2.5 percent a year. On the positive side, the small number of mishaps may show that pilots normally cope with the myriad of situations confronting them during taxi. It also points out that the Air Force does a fairly good job in providing the pilot a safe taxi environment.

On the negative side, this may only make the pilot complacent about the problem. It may also show that past efforts have been unsuccessful in reducing taxi mishaps. Is there anything we can do?

Judgment is a hard thing to teach, but as a pilot, you should realize that human error is an ever-present possibility. Taxi defensively! Don't assume the marshaller is going to provide adequate clearance. Don't assume other aircraft are parked correctly. Don't assume the taxi lines at a strange field will give you the same clearance as home station. And if nothing else, when you get the feeling that something's not right, stop! Don't assume it will be just another close call.

If you suffer from any of these assumptions, you may be in for a surprise. Although the odds are on your side, you may be getting closer to learning the hard way that there are no guarantees when it comes to taxiing. Don't *assume* anything. ■

Talk To Me!

About Communication In Aviation Or The Need To Let

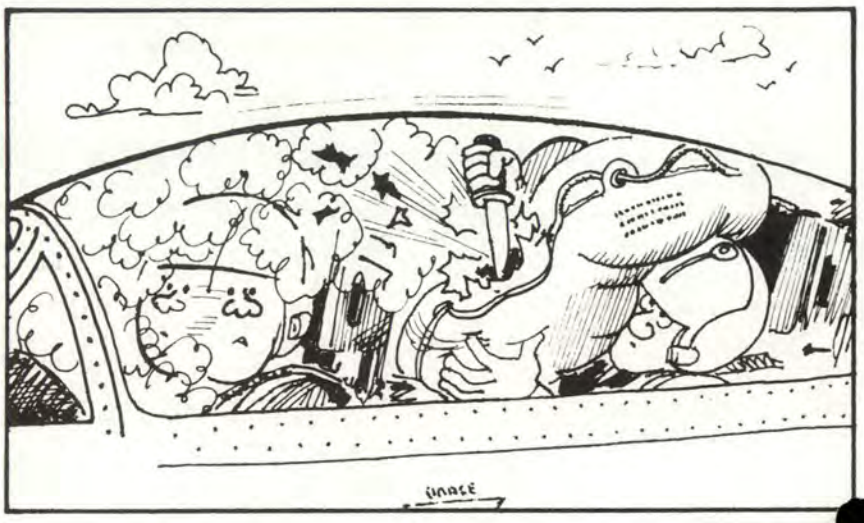
LT COL HORST GAEDE, GAF • Directorate of Aerospace Safety

■ The dictionary defines communication as a "giving or exchanging of information, signals, or messages by talk, gestures, writing, etc." From a basic viewpoint, the process of transmitting and receiving information is so fundamental to our life that without it, society or any kind of organization could not exist, and we could get nothing—absolutely nothing—done. One task which definitely could not be accomplished without proper and timely communication is flying an airplane. Be it the single-seat jock (lucky you!) who talks to the outside-the-cockpit world (and sometimes to himself), or be it the aircrew, a term we use when we put two or more people in a concerted action to operate an air machine, communication makes it all happen! But sometimes it does not happen the way we'd like it to.

Here are some examples of poor or no communication at all in critical aerial situations. These stories were by no means made up for this article, but rather drawn from historic records. On some, the ink has not yet dried. Read and see for yourself. I know, these stories could not have happened to you!!

Story Nr 1

Quite a few years ago, an old, faithful T-33 was cruising along at high altitude, when the backseater was surprised to see and feel his life raft become inflated. This caused a good deal of discomfort to him, but worse, it was pushing against the control stick causing the aircraft to nose over into a dive. The front-seat pilot, actively flying the aircraft at that time, associated the stick movement immediately with some kind of flight control problem or run-away trim. To prevent the aircraft from exceeding its designed speed limit, he retarded the throttle to idle. Meanwhile, the backseater had pulled out his knife and managed to puncture a hole into the misbehaving survival gear. The raft gave up its life with a thump, filling the cockpit with a cloud of white talcum powder. This was interpreted by the frontseater as an explosion "back there where the engine sits" and prompted him to move the throttle to OFF. The backseater, realizing they were going down, no engine, felt that ejection was the only way out and did just that. The front-seater followed suit some seconds later. Needless to say, the reunion on the ground was quite embarrassing.



Story Nr 2

After 40 minutes of uneventful cross-country flight in a T-38 with the student pilot flying the aircraft from the rear seat, an abrupt yaw and 10 to 15-degree roll to the left occurred. The IP took control of the aircraft, declared an emergency and turned toward a nearby base. Suspecting a serious aileron disconnect problem, he ordered the student pilot to prepare for ejection. Somewhere in the descent, when the IP began a level-off for a controllability check, the student pilot noticed the control stick shake which he interpreted as a non-verbal signal to transfer aircraft control. He subsequently came on to the stick without informing the IP, although intercom was available. For the next 15 to 45 seconds, the IP and the student unknowingly created strong simultaneous and conflicting control stick inputs which made them

believe the airplane could not be landed. Both crewmembers ejected.

Story Nr 3

During a night departure, the IP in the aft seat of a T-38 lost all inter-cockpit and air-to-ground communications. Since they were in VMC and this emergency was specifically briefed prior to takeoff, the IP assumed control and attempted to maneuver for a visual radio-out landing. The student, suspecting a simulated emergency (!) continued on the stick for a while. When the IP shook the stick again, the student relinquished control of the aircraft but felt challenged to reassume control a short time later when he saw the stick shake again. Predictably, the situation deteriorated to the point that the IP concluded a flight control malfunction existed and loss of aircraft control was imminent. He ejected there and then. The blast from the rocket seat filled the front cockpit with smoke and gave the student pilot the impression his instrument panel had exploded. However, when the explosion was followed by the sound of a personnel locator beacon, which this time he correctly identified as the IP's, he immediately ejected himself.

Story Nr 4

This mission was an advanced handling characteristics sortie in an F-4 being conducted in an overwater training area with a marginally defined horizon. After accelerating to Mach 1.2 at 18,000 feet, the IP instructed the AC to make a turn in order to demonstrate a transonic mach tuck. However, the AC rolled to approximately 120 degrees of bank and pulled 6 to 7 Gs in a sliceback maneuver. Passing 10,000 feet, the IP directed the AC to come out of afterburner and terminate the maneuver. Although his exact words could not be recalled, he used words to the effect of "Let's knock it off," "Let's slow it down," or "Hey, come out of burner." Without getting any response from the AC, the IP found himself ejected from the airplane a short time after. Unfortunately, we'll never learn what led to the AC's perception that ejection would be the only way to escape. He did not survive. But, possibly he was influenced by misinterpreted communications, compounded by other possible factors like disorientation, G-forces, or optical illusion.

Story Nr 5

The IP in the rear seat of an F-4 was making a wing formation landing with a foreign student in the front cockpit. He expected the student to monitor runway alignment and this had been specifically briefed. The student was rather shy and retiring by USAF standards, and expected the IP to make necessary corrections. His culture and background made it difficult to correct a superior. However, he recalled advising the IP he was "on the right side" in his normal voice over the overrun, but the IP did not recall hearing this. The aircraft touched down with the right landing gear off the side of the runway, finally sliding to a stop on its belly.

If you have been around in cockpits for some time, I'm sure you could add many more stories to this. Looking at my own experience, at least, made me, the writer, (or communicator) convinced that the old saying, "Speech is silver, silence is golden," is not valid in aviation. You too? Well, then, talk to me! P.S. Remember the dialogue between the student pilot and the IP (the IP flying formation on the right-hand side?).

IP: Turn left!

SP: You mean left?

IP: Right! ■

The MYTH Of The

LT LAWRENCE H. FRANK, MSC • COMNAVAIRPAC Staff

■ How often have you heard the cause of an accident attributed to *accident proneness* on the part of the individual involved? *Accident proneness* is a convenient label, but it's not a cause. The term *accident proneness* is a misnomer, a myth. By calling someone accident prone, you are stating that he was born to have accidents, that his hereditary nature make him a klutz, and that there is nothing that can be done to stop him from having an accident.

This is just plain balderdash. Geneticists haven't discovered any *accident proneness* genes, and research studies have shown that we can't even predict a person's likelihood of having an accident from his past accident history. But accidents can be prevented, as will shortly be pointed out.

If *accident proneness* is a myth, why do some people appear to have more than their share of accidents? To answer this question let us first examine the reasons why a single accident occurs.

In almost every accident, the accident investigator is faced with a myriad of contributory variables. Very rarely is there a single cut-and-dry cause factor. There are almost always numerous contributory variables, such as poor man-machine interface, supervisory error, limited experience, failure to use accepted procedures, task oversaturation, overconfidence, etc. Sometimes these variables are transitory and stress related. For example, the accident victim may have been suffering from some temporary physiological variable such as fatigue, anoxia, hypoglycemia, or a temporary psychological variable such as boredom, anxiety, frustration, or depression. Environmental variables such as weather also play an important role. Often, if one or more of these variables hadn't been present, the individual's performance may not have been comprised enough to result in a human-error accident.

Although there are several reasons why a person could be involved in an accident, is there a common denominator among these various reasons? Some early psychological research is suggestive. A few years ago a Navy flight surgeon/psychiatrist developed a psychological profile of the high-accident-risk aviator (he actually used the term accident prone, but we now know that this term is inappropriate). However, when you compare this theoretical profile of the high-accident-risk aviator to the psychological profile of the outstanding aviator, you make a very interesting discovery. Namely, the profile of the outstanding aviator and the high-accident-risk aviator have much in common, with the exception of one very significant factor. The high-accident-risk aviator appears to be undergoing stress, whereas the outstanding pilot is not. Does this suggest to you that an outstanding aviator undergoing stress is, in actuality, a high-accident-risk aviator?

This doesn't mean that all human-error accidents are caused by stress. What it does suggest, however, is that if stress is present, and if the quantity and/or severity is great enough, an individual—any individual—will be more likely to be involved in an accident. This individual shouldn't be considered accident prone, but rather one who has currently entered a high-accident-risk category. And everyone at some point in time enters this category. If you alleviate the stress, you reenter the low-accident-risk category where, incidentally, the majority of us are most of the time.

Accident Prone

What exactly is stress? Stress is simply a normal "reaction of the body to the ordinary and extraordinary pressures of life." The presence of stress initiates hormonal and various other physiological changes, and can cause a drastic impairment in a person's cognitive and motor functioning. Remember Joe and his problems? What if you knew that Joe had been undergoing severe stress during the weeks prior to his numerous mishaps? His father, with whom he had a very close relationship, had recently undergone arterial bypass surgery. Joe's daughter, in asserting her independence, moved out of Joe's house, against his wishes, and into an apartment. Joe stopped smoking 2 weeks ago and has taken a second mortgage on his home. All these events are stressful. In light of what has been discussed, is it surprising that Joe has had a few close calls? When the stress diminishes, Joe will reenter the low-accident-risk category and be his old self again.

Prevention of stress-related accidents is a two-step process. First, you must learn to recognize that you are undergoing stress, and second, you must take action to reduce the stress affecting you.

Recognition of stress is really not all that difficult, since there are usually accompanying behavioral changes with increased stress. The following are common reactions to stress: anxiety, preoccupation, impatience, humorlessness, inability to concentrate, restlessness, frequent or prolonged headaches, unhappiness, depression, frustration, aggression, irritability, defiance, insomnia, and apathy or indecisiveness. A person undergoing stress will exhibit some but not all of these symptoms. The key is that the stressed person is behaving atypically. He is just not himself.

Reduction of stress in most cases is relatively easy, and can be handled in one of several ways. Physical exercise is an outstanding method of stress reduction. Whether it is intense, such as playing racquetball, or less strenuous, such as walking, it works well. Hobbies and other nonathletic events that you enjoy and derive pleasure from, such as reading, building model planes, needlepointing, or playing backgammon, are also excellent stress reducers. Your medical officer can provide you with specific "how to" information on relaxation therapies such as tensing and relaxing various muscle groups, or meditative techniques, which are easy, effective, require no special equipment, and can be performed by anyone. Additionally, don't sell your wife or good buddy short. Talking your problems out with someone whose opinion you value, or with someone who will just listen patiently, may be the best stress reducer around. If the stress you are encountering is so intense that these methods provide little relief, don't be afraid to seek professional help. It may save your life.

In summary, remember that everyone (wife, pilot, crew chief) enters the high-accident-risk category at some time or another. Entrance into this category is often preceded by a buildup of stress caused most frequently by the everyday variables that upset the normal routine of life. Consequently, when stress is present, increased awareness and caution are required. When you see the telltale behavioral changes taking place in yourself or someone else, take the necessary steps to reduce the stress and get back to being a low-accident risk. And, above all, remember the myth of the accident prone. — Courtesy *Approach* Magazine. ■

OPS topics

continued from page 13

For Aero Clubbers

A couple of aero club pilots are probably more careful and attentive to detail than they were. Both of their mishaps resulted from poor planning, poor judgment and poor luck. Both were flying C-150s.

The first one was flying near the ridgeline over a valley at an estimated 500 ft AGL—a perfect spot for a wire. The wire was there; it scraped over the engine cowling, up the windshield and over the wing, along the top of the fuselage to the vertical stabilizer where it gouged out the rotating beacon. Fortunately, the pilot made it to destination, probably a bit wiser. Flight planning was sadly deficient.

The other aero clubber made the mistake of assuming something that wasn't so, like there's plenty of gas in that tank and the gage must be accurate.

The pilot flew one half of a cross country uneventfully but then made a serious mistake. Although the aircraft was at a large field with fuel, the pilot decided to fuel at another airport on the way home, and made another assumption—that fuel would be available. It wasn't. So onward, hoping that the fuel level on the gage and the time on the Hobbs meter would work out to a safe landing at home base. The pilot called the tower at 10 miles but did not indicate any problem. Finally, the engine sputtered and quit. The pilot made a great forced landing.

Precision Guidance

While conducting a localizer approach, a T-38 crossed the 9 DME final approach fix and began descent to the MDA as published. Reaching the MDA prior to 6 DME, the crew felt they were very close to the ground. After landing, they checked the TACAN approach and discovered it had an intermediate level-off altitude at 6 DME. The pilot felt the same restriction should apply to the localizer approach.

A HATR investigation revealed that because the TACAN approach uses *non-precision* course guidance, the primary protected airspace includes a greater area than the *precision* course guidance of the localizer approach. The localizer approach met all obstacle clearance criteria; the approach was safe.

Criteria for designing precision and non-precision instrument approaches are contained in AFM 55-9, "Terminal Instrument Procedures."—SMSgt Marshall E. Holman, Directorate of Aerospace Safety. ■

Flip Improvements

■ The Air Force has been seeking improvements to the Flight Information Publications (FLIP) for some time now. After extensive research and coordination, improvements to the U.S. Terminal Instrument Approach Procedures have been made.

■ Effective 22 January 1981, the former nine-volume low altitude product was expanded to 12 volumes, thereby reducing thickness to ⅝ inch or less. The 12 volumes contain all the approaches published in the former nine-volume product.

■ A new five-volume low altitude product entitled "Selected Low Altitude Instrument Approach Procedures" was published. The set contains approaches to all DOD (and most civil) runways which are at least 5,000 feet long and have a weight bearing capacity of 60,000 pounds or more, and significantly reduces the bulk of the low-altitude product for most AF operations since it eliminates approach procedures to airfields where most USAF aircraft cannot land. The five-volume set is identified by blue cross-hatching at the top and bottom of the covers.

■ Radar minimums are published in the front of each volume of the 5 and 12 volume sets. This aligns the U.S. product with the overseas issues.

■ Full page airfield diagrams are published for all major airports. An important feature of these diagrams is a grid overlay to provide coordinate information for INS equipped aircraft.

■ Beginning 19 February 1981, the Military Aviation Notice (MAN) for the Terminal Low Altitude procedures will apply to both the 5 and 12 volume sets. Radar minimums and airfield diagrams will be published in the U.S. High Altitude product. Inclusion of the radar minimums in both high and low altitude products will result in deletion of this information from the IFR Enroute Supplement.

These new publications have been designed and developed to provide a more useful product to the flight crew.—*SMSgt Marshall E. Holman, Directorate of Aerospace Safety.* ■

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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 Accident Prevention Program.

CAPTAIN

Steven F. Woodford

SECOND LIEUTENANT

James D. Halsell

429th Tactical Fighter Squadron
Nellis Air Force Base, Nevada

■ On 14 May 1980 Lieutenant Halsell, pilot, and Captain Woodford, instructor pilot, were returning to Nellis AFB as nr two in a flight of two F-4Ds after an air-to-ground weapons employment mission, Fifteen miles from the field, the MASTER CAUTION and CHK HYD GAGES lights illuminated. Lieutenant Halsell noted the power control system (PC-2) hydraulic gage fluctuate between 1,500 to 2,500 PSI and then go to zero. Captain Woodford took lead of the flight, declared an emergency, and started going through the checklist for PC failure. As Lieutenant Halsell maneuvered for a straight-in approach and lowered the landing gear handle, he noticed that the main gear took a long time to extend and the nose gear was still indicating up and locked. The wingman confirmed two main gears were down, but the nose gear still up and locked. Lieutenant Halsell saw the utility hydraulic pressure rapidly approaching zero. Captain Woodford called for emergency gear lowering to blow the nose gear down, while he continued with the checklist and coordinated with the SOF and tower for an approach end cable engagement. Lieutenant Halsell maintained a minimum of 230 knots and had to use manual rudder to counter the unstable rolling tendencies of the aircraft. Because of the significantly degraded handling characteristics, Captain Woodford directed Lieutenant Halsell to make left turns to line up on a straight-in approach using the only effective roll axis flight control surfaces available, the left aileron and spoiler, to pick up the left wing. Lieutenant Halsell continued to fly his final approach at 230 knots to optimize aircraft control. Despite a 10 knot tailwind, he made a successful end cable engagement. The exceptional airmanship, crew coordination and professional reactions of Captain Woodford and Lieutenant Halsell to a serious inflight emergency resulted in the successful recovery of a valuable aircraft and averted injury or loss of life. WELL DONE! ■

Gear Up Landings Are No Fun