flying

SAFETY

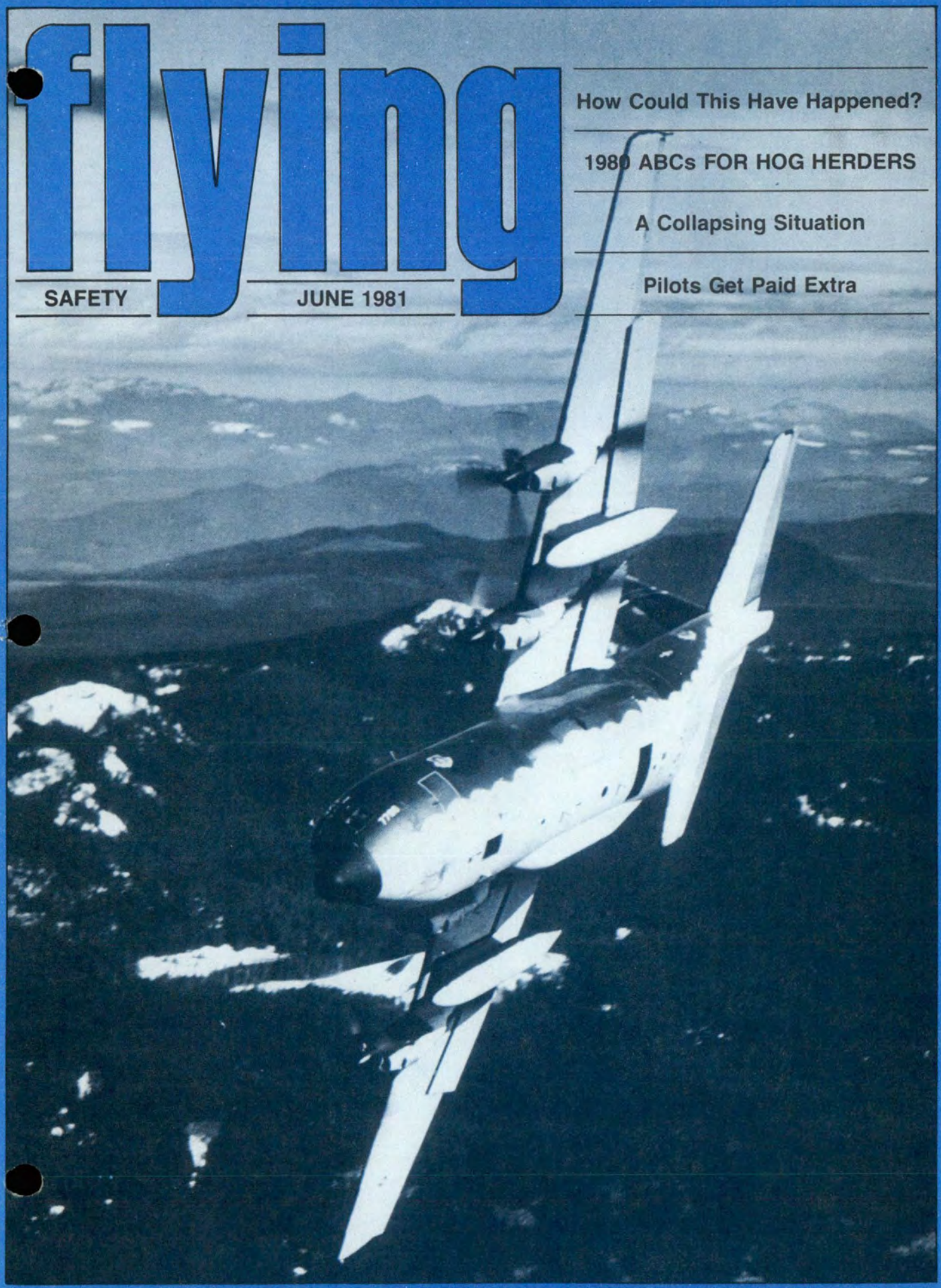
JUNE 1981

How Could This Have Happened?

1980 ABCs FOR HOG HERDERS

A Collapsing Situation

Pilots Get Paid Extra



I Know My Limits

CAPTAIN DENNIS P. BROOKS
Det 15, 39ARRW
Patrick AFB, FL

■ Have you ever had one of those days? I got up at 0130 and staggered to the shower. As the icy blast hit me I realized the power had been off again and there was no hot water. I endured the shivers long enough to wake up, then stepped out to take two extra strength pain relievers for a mounting headache. A couple of quick sniffs of a nasal inhaler opened up the clogged sinuses, then I shaved and dressed for the flight.

As it was too early to wake the wife, two cups of coffee and a stale doughnut made breakfast. Now I was plagued by the sniffles, but a *Contact* would cure that. After all, I only had a three hour trainer flight.

Boy, I sure am sleepy. Lucky I keep *No Doz* in the car, no worse than a cup of coffee, right? Work at last. Another quick sniff or two of the inhaler will get me through the briefing.

Whoa, things are really feeling shaky this morning, but it's the kid's last ride before a check, and the boss wants it finished today. Got to get the job done.

The cockpit sure is closing in on me today. Man, my head is bigger than a basketball, but a little 100% 0_2 will fix me right up. The kid looks like he feels pretty rough this morning, too. He's really feeling the last two we had at the club last night. Of course, an old hand like me only needs the five-and-a-half hours sleep we got last night.

These early morning flights can sure be dark. I can't see a star or light in front of us. IT'S A MOUNTA . . .

An Air Force flight on a training mission was lost this morning when it struck a 9,000 foot mountain at the 7,000 foot level. The flight was last heard from when the pilot reported the aircraft level at 17,000 feet. There were no survivors.

The above is a fictitious account, but all too often some part of this scenario is uncovered in Air Force accident investigations. The phrase, "I know my limits," is not applicable in today's Air Force. Technology and science have brought pilots beyond a point where their senses are enough. If you have to rely on unprescribed medication and cannot find the time for adequate crew rest, use a little common sense and intestinal fortitude and stay on the ground.

Beyond all the platitudes, sermons, and lectures is one very short yet very important question: "Is the mission worth so much or myself so little that I will give my life for it?" ■

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SPECIAL FEATURES

REGULAR FEATURES

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How Could This Have

MAJOR GARY L. STUDDARD
Directorate of Aerospace Safety

■ It is certainly no earth-shaking observation to state that people cause accidents. From design, to manufacture of parts, to assembly, to maintaining the aircraft, and to the actual flying of the mission, all depend on people. If everyone were properly motivated, trained, oriented, and self-disciplined, there wouldn't be a problem. But, since people are often less than perfect, it is necessary to be alert for each other's human frailties.

Mishap investigations are looking deeper and deeper into the human factor aspects of mishaps in an attempt to answer why people do the things they do. Surely nobody wants to cause injury or damage. An analysis of people-caused mishaps shows, for the most part, the mistakes made are not because of gross and deliberate departure from procedures or directives but, rather, involve good people working hard to "accomplish the mission." Unfortunately, sometimes in the zeal to do the best one can, often combined with a time compressed atmosphere, a subtle breakdown in discipline, a slight deviation from the book, or a bending of a procedure may occur. Again, this is human nature and people are prone to do something haphazardly because it is "too much trouble" to do it the right way.

In discussing human aspects of a mishap, it is not easy to categorize all the human factors which can come into play. Following a mishap where it is obvious that a human mistake (whether it be maintenance or operations) resulted in some undue risk, the typical question is, "How could this have happened?" It is tempting to reply, "The guy just had his head up and locked!" However, this is too simplistic. There are far too many human variables which could be involved. They range from some of the more sophisticated terms like channelized attention, loss of situational awareness, and habit pattern reversal to areas such as attitude, training, stress, judgment, complacency, pride, and peer pressure, to just plain carelessness or inattention—to mention only a few.

I hesitate to preach too loudly to the first line jocks or the experienced maintenance troops in the field about the intricacies of "shooting one's own toe off." What I can do, however, is briefly describe some recent mishaps (which could potentially have been worse) and let you decide for yourself . . . HOW COULD THAT HAVE HAPPENED?

■ Upon completion of the mission, the pilot returned to homeplate for landing. But due to a runway closure, a divert to a nearby base was directed and accomplished. Aircraft configuration was three external tanks. For expediency, the pilot requested the ground crew to give an internal fuel load only. Transient alert uploaded 12,250 lbs of fuel, but this all went to the external tanks and the internal wing because the refuel/defuel switch was not placed to the refuel position. Upon return to the aircraft, the crew noted there was fuel in the three external tanks which should have remained empty. After power was applied, the fuel gage indicated 500 over 5200 indicating only 500 lbs of fuel available until takeoff was accomplished, and the internal/external tanks became pressurized and started feeding. The crew discussed the situation and decided to take off! During an afterburner takeoff, at approximately 130 knots, a noticeable loss in thrust occurred due to fuel starvation. An abort and a departure end cable arrestment were accomplished. If liftoff had occurred, there would have been a Class A mishap added to the annals of history.

■ A student pilot had recently changed from a late to an early flying schedule and had noted difficulty in adjusting to the early-to-bed, early-to-rise schedule. The pilot had not brought his fatigued condition to the attention of any flight supervisory personnel and elected to fly the scheduled early mission. During a touch-and-go landing, after a normal touchdown, the pilot raised the gear handle before advancing power from idle. The gear started to retract, and the aircraft began settling to the runway. Power was advanced to military thrust, vice max power, and the aircraft continued to settle for approximately 1,800 feet. The investigation revealed that had the pilot selected max power instead of military, the aircraft might have regained flight. Final damage was $100,000 plus. The flight surgeon

HAPPENED?

determined that, as a result of several days of restless sleep, the pilot had mild acute fatigue resulting in his momentary inattention. Also, the pilot had never performed a max power go-around except during stall series practice at altitude. As the gear started to retract, he just didn't grasp the necessity of using max power.

■ During a night preflight, maintenance personnel discovered the auxiliary hydraulic system accumulator pressure was low. A nitrogen cart was requested to reservice the accumulator. But due to a misunderstanding in the request, an oxygen cart was delivered to the aircraft. Reservicing of the accumulator was attempted with both fittings that were with the cart. The crew chief was unable to properly attach the fittings to the servicing port so he held the high pressure side of the system against the accumulator fittings and completed servicing. Six days later, when the pilot turned on the military hydraulic system during a final approach, a fire occurred in the accumulator. The system was deselected, and luckily, an uneventful landing was accomplished.

When maximum braking was applied during landing rollout, both main tires blew because the emergency brake system bypassed the antiskid protection.

■ During a night preflight inspection, a crew chief failed to bleed the emergency brake accumulator as directed by the preflight inspection checklist. On preflight, the pilot found the accumulator overcharged and asked the crew chief to correct it. The crew chief pulled the emergency brake handle in the front cockpit and pumped the brakes until the system was bled to the proper pressure. The crew chief then exited the aircraft but failed to reset the brake system in the nose wheel well. The pilot finished his preflight, started both engines and taxied to the arming area before he realized the emergency brake handle was still out. He placed the brake handle back into its receptacle and told the backseater the system would have to be reset by the quick check crew. Later, the aircrew forgot to notify the quick check crew, and the brake system was never reset. When maximum braking was applied during landing rollout, both main tires blew because the emergency brake system bypassed the antiskid protection. Fortunately, aircraft control was maintained, and runway departure did not occur. How many people in this chain of events could have prevented this mishap?

■ In one particular type of aircraft, in order to satisfy security requirements, the engine start, engine ignitor and APU circuit breakers are routinely pulled by the crew chief. In an attempt to help the ground crew, a pilot had adopted a rather unorthodox procedure of pulling these circuit breakers during his after landing check. After a normal mission, the pilot was taxiing to parking, and he attempted to pull the three circuit breakers. However, he mistakenly pulled three circuit breakers above the intended breakers, one of which included the landing gear breaker. This immediately disabled the normal brakes and nose steering system. The aircraft continued straight ahead off the taxiway, and the right wing contacted a tree before the aircraft finally stopped.

The list could go on and on. In each of the above incidents, for whatever reason, the "basics" were forgotten, and one of us humans made a mistake. No matter how you cut the cake, there is nothing in aircraft operations or maintenance too basic to worry about. The prevention of mishaps requires a commitment from everyone. The weak-link theory is especially applicable. All maintenance personnel and aircrews must foster self-motivation and self-discipline while being cognizant not only of their own shortcomings but also the limitations of others. The "basics" include a total commitment to the rules, no short cuts, no complacency, and no "close enough for government work" attitude.

I realize we can't stop every accident, but the goal is to prevent the senseless ones. Success depends on a continuous sense of awareness, remembering all along we all have particular human shortcomings. Unfortunately, there may be some of us who are *too human*.

"He is free from danger, who, even when safe, is on guard." ■

1980 ABC's FOR HOG HER

MAJOR JAMES H. GROUND • Directorate of Aerospace Safety

■ The A-10 Class A mishap rate in 1980 was a significant improvement over that of 1979, and particularly noteworthy in light of a 50 percent increase in flying hours. There were eight Class A mishaps in 1979 for a rate of 9.2/100,000 flying hours. Eight aircraft were destroyed with a loss of four lives. In 1980 there were five Class A mishaps for a rate of 3.8. Six aircraft were destroyed and four pilots were fatalities.

The dramatic decrease in the Class A rate didn't just happen all by itself. It reflects the hard work and positive attitude toward accident prevention that is prevalent throughout the A-10 community. This attitude is demonstrated daily by both military and civilian maintainers, operators, supervisors, technicians, engineers, clerks, managers, and others. It encompasses a wide spectrum of missions from the contractor to the operational unit. It also expressed the high degree of professionalism and dedication exhibited by your safety personnel.

Let's talk just a little bit more about this year of major improvement which we hope will continue. There's another way to look at 1980 that you may not have thought about. It was in 1980 that the A-10 community's cumulative aircraft loss equated to one Air National Guard squadron—that's right, one unit just evaporated! But, that's a cumulative total since 1977, you say—it was bound to occur some time. Besides, we're always going to have accidents. Isn't that revelation a bit unrealistic? Unrealistic—maybe so, but that unrealistic fact occurred in 1980. That "banner" year of 1980 may also serve as a reminder to Hog Herders of that squadron that will never compete in the next turkey shoot or fly in combat, not to mention half a squadron of good friends and comrades we'll never fly with again. That's a little heavy and a little negative for such a "banner" year, but another way to look at 1980—think about it!

Enough of the numbers juggling and philosophy. Let's take a closer look at 1980 Class A's starting with a synopsis just to jog your memory.

- Low altitude inverted recovery—impacted ground—fatal.
- Low altitude tactical turn—ejected safely to avoid ground impact.
- Low altitude tactical orbit—impacted ground—fatal.
- Low altitude tactical turn—impacted ground—fatal.
- Midair during tactical rejoin—both ejected safely, one fatal (drowned during rescue attempt).

It's no surprise to Hog drivers that the problem area is in the low altitude tactical environment. It is a little surprising to see the majority of mishaps occurring in less intense situations such as a tactical turn, orbit or rejoin. There is a possibility that one mishap occurred as a result of latent symptoms of a fairly sharp bump on the head suffered during preflight. While this evidence wasn't conclusive, it did appear to be one logical explanation of why a pilot would fly into the ground from a 1,500 ft AGL orbit without saying a word. Two other mishaps were just as puzzling. Maybe both mishaps occurred due to inattention, distraction, task saturation, or misjudgment by allowing the aircraft to attain an attitude from which safe recovery was impossible. The midair may have occurred due to misjudged closure rate (or inattention or distraction).

In all of these cases, logistics factors were investigated with no conclusive evidence pointing to any discrepancies. For the most part, evidence appeared to indicate the aircraft were all operating normally. Flight controls were suspect in a couple of cases, but these indicators may have developed during the breakup of the aircraft on initial impact. One mishap involved a single engine.

The best evidence in 1980 that a pilot can get trapped by his environment and *almost* lose total situational awareness was the mishap involving the ejection to avoid ground impact. Fortunately, the pilot's still with us to help explain what was apparent to him as near-disaster. That mishap may have been trying to tell us something about a couple of those possible causes mentioned before. The visual illusion which this pilot may have experienced as he got closer and closer to the ground played a nasty trick on his situational awareness. Whatever environmental or judgmental factors which led him into that predicament support the idea that loss of situational awareness can happen to any of us at a critical moment. Maybe it's

DERS

happening too frequently in an environment that's totally unforgiving of errors of situational awareness.

If you even suspect that your grasp of the situation is slipping away, climb out of that unforgiving environment, call "knock it off!", and regain control of the situation. Even if your worst suspicions are totally erroneous, probably the most you have lost is some training time and a little pride. You might just be correct in that gut feeling that something's awry. And if that's the case, don't stop with the flight debriefing, pass the word around. It might be a good article for "There I Was" in *Flying Safety*. It might break down some other pilot's pride barrier and save his life in a similar situation. Think about it!

After thinking about Class A's, how about a quick look at Class B ($50,000 – $200,000) mishaps in 1980 – now that's a "hot" story.

- Nr 2 engine overtemp on start – APU malfunction.
- Nr 2 engine fire – flex metal fuel hose cracked.
- Nr 2 engine fire – B sump O ring seal leak/scavenge pump inadequate.
- Nr 1 engine FOD – compressor damage from fastener.

The A-10 community has focused some strong attention on these mishaps. Improvements are in the field or on the way for all of these malfunctions including the fastener problem. The APU inadvertent shutdown problems should be corrected with a new design control. That is still in development and probably will not be in the field for some time. In addition, an inlet turbine temperature aural warning is being sought as a supplement to indicator lights. The flex metal fuel hose is being replaced with a teflon hose. The B sump flooding is being improved by changing the O ring seals and adding a scavenge pump with increased capacity.

The fastener problem is being attacked on several fronts. A supply problem contributes to the use of unserviceable or improper fasteners. New requisitions have been made to alleviate this situation in the future. Overtorquing, insufficient training, improper tool use, and inadequate technical data are also contributors. A light-weight torque tool is being tested in the field now. A training program is being developed – should be in the field soon, and tactical data has been revised. While this looks like a maintenance problem, pilots can provide some help as another set of eyes on the lookout for loose fasteners during preflight and postfight. There's possibly a $550,000+ bonus in it for your unit just because of your eagle eyes. By the way, for those of you who track rates, the 1980 Class B rate for the A-10 was 3.1.

It would be a bit impractical to list the 211 Class C ($300-$50,000) and 35 High Accident Potential (HAP) mishaps so we'll only look at some of the major concerns. Engine problems dominate with about 57 percent (140) of the Class C/HAP reports. The big items are flameouts, stalls, or stagnations (53). Subcategories include gun gas (8), maneuver (9), fuel system/quick disconnect (10), and undetermined or final report not yet received (16). Other significent engine problems are oil system (28) and engine FOD (fastener 23, ice 14, birdstrike 7).

Most of us are familiar with the proposed modifications to reduce

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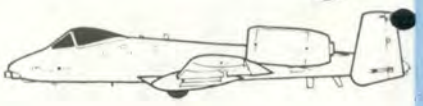
1980 ABC's FOR HOG HERDERS



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flameouts. Ignition-on testing has been completed for the trigger actuated ignition, but testing will continue for Alpha-Mach actuated ignition to accurately determine engine ignitor life. A decision to choose either the stabilized mitered barrel, double baffle deflector, or Battelle stripper (XP) will be made at the completion of testing later this year. Flight testing has been completed and performance charts are being updated to more accurately depict the engine operating envelope. Special engine flameout reporting may help isolate the problem even further. The main fuel quick disconnect is being improved with a positive locking mechanism. Oil system improvements include a proposal which would all but eliminate the loose sample/filler cap problem. It requires positive locking before the access door is closed and is being accomplished at the unit level. Your special attention is still required when cross-country. Other oil system improvements and fastener FOD reduction improvements were discussed under Class B mishaps.

Ice FOD incidents were minimized because pilots have been avoiding icing conditions when possible. The latest word is that the anti-icing program might be terminated since it appears to be more cost effective to repair or replace damaged blades than to modify the fleet with an anti-icing system. Incidentally, there is no truth to the rumor that all seven engine birdstrikes were in the exhaust section of the engine—I think it was only five.

Wheel and tire problems continued to plague us in 1980. Tire failures are causing extensive damage and present a high potential for a serious accident. The 14 tire failures in 1980 reflect a steep upward trend and indicate a rate double or triple that experienced by other tactical aircraft such as the F-4 and A-7D. Most of you are probably aware that the 22-ply A-10 MLG tire is an off-the-shelf item (C-141 NLG tire). A 24-ply F-105 tire was thought to be a compatible replacement when the 22-ply tires began failing. The 24-ply tires experienced very few failures but caused cracks in the wheels, so we're back to the 22-ply new and rebuilt tires for a while. In an effort to reduce the failure rate of rebuilt tires, holographic (laser) NDI is now being performed prior to shipment. Thermographic and dynamometer testing has been conducted using A-10 taxi, takeoff, and landing profiles. From these tests, a new tire specification is being developed. With no delay, distribution of a new tire could begin in late 1982. If this proposal is not carried out, a stronger wheel presently being developed is expected to be compatible with the 24-ply F-105 tire.

Wheel failures are also on a steep upward trend, but there is a light at the end of the tunnel—and no, it's not a train. As previously mentioned, a new high-strength wheel is being developed and the engineering change proposal (ECP) has recently been approved. If no delays occur during development and testing, we should see the new wheel in the field by Nov-Dec 82. Expediting the delivery schedule is certainly being studied. While this process is underway, proper servicing, thorough NDI and careful management of supply levels, will be required.

Another area of concern is flight controls. There has been a lot of discussion concerning this topic for the past several months. Some of what you hear or read is accurate and some is speculation or rumor. Just a quick rundown on reported primary flight control mishaps for

1980 should give you a better understanding of the situation. Of 14 mishaps, six were caused by improper maintenance, inspection, or inadequate TCTO instructions. Only one of these six was a foreign object (9/16" socket). Four were materiel malfunctions. One was attributed to overtaxing the system—control input rate exceeded design capability. One was caused by a bird's nest binding the aileron actuator control valve. Two were undetermined. One mishap was associated with differential stick pressures experienced with one engine operating and the roll trim not in the "T/O trim" position.

Attempts to alleviate these problems are many and continuous. Quality control regarding work on flight controls has been improved throughout the A-10 community. This area will continue to get close scrutiny, but we shouldn't focus all attention on one area and allow other potential problems to slip through the crack. Of prime interest are materiel malfunctions, the INS/HARS/SAS interface being a notable example. Proposals are being considered to monitor electrical signals from the HARS which are generating uncommanded control inputs. Of major importance in helping us isolate the causes and avoiding "undetermined" findings is a standardized flight control malfunction investigation checklist currently in the field for review and refinement. Along with that effort is a Quick Reaction Team formed solely for the purpose of responding to flight control problems. If time permits, the team will respond telephonically on initial contact and then follow up with a visit. Unit SOFs and QA personnel should be aware of local procedures integrating the QRT notification and checklist items.

Fuel foam fires, apparently from static discharge, appeared again in 1980—the first since two in 1977 which were thought to be isolated occurrences. Only two mishaps occurred in 1980, but this subject is addressed as a special topic due to the large number of mishaps that have occurred since Dec 80 (30 as of this writing). A special team of experts has been formed to solve this problem. Several areas are being explored, including the nature of the foam, fuel, conductivity additive, bonding, grounding, external static sources, and the aircraft ground and air refueling systems. The most promising interim solution appears to be to disconnect the air purge system. The team is still conducting extensive tests in search of a permanent fix.

In a rather large nutshell, this has been one look at Warthog ABC's. This cursory glance leaves a lot of background information out of the picture and, in some cases, may not do justice to the problem. It's an effort to inform A-10 pilots of what we saw in 1980 and what we're trying to do about it in the future.

You might be aware of all of these problems or maybe just a few of them. Perhaps you're concerned about a problem, but you're not sure how to approach it. Maybe you're "hot-under-the-collar" about an improvement that was never implemented. If so, voice your opinion—dig into the problem. Changes can be made or expedited when you realize that safety is more than "sand in the gears of the war machine." Think about it!

If you want further information about a problem discussed in this article or one you've experienced or know about, contact your squadron or wing safety officer or give me a call at AUTOVON 876-3886. In the meantime have a good, safe hunt, Hog Herders! ■

S·O·E·F·A·T

By CAPT JEFFREY TAYLOR

■ SOEFAT; the acronym that describes the sole purpose and objective of our Air Traffic Control system and the Air Traffic Controllers who make it work, means—the "Safe, Orderly, Expeditious Flow of Air Traffic."

To the maximum extent possible, the controller wants to provide a service to the pilot. He wants to avail to you the type of operation which is most advantageous to your mission requirements. There are, however, a multitude of circumstances which could either favorably or adversely affect his ability to grant your every wish.

"Unable due to traffic," is one we've all heard. Sometimes it may seem unjustified if you don't hear constant chatter on your frequency, but you'll seldom know the total traffic picture or just what is the cause for the tie up. When traffic saturation occurs, delays are incurred. Although this is a frustrating situation, it is one that can be tolerated in this case because both the pilot and controller are empathetic toward each other's problems.

However, when delays or seemingly ludicrous handling is incurred for no apparent reason, mutual cooperation ceases; tempers flare, demands are made, special handling occurs and an unsafe situation could result. When you start getting unexpected vectors, you will also be given the reason. If not, and you feel they are unnecessary or for some reason cannot accept them, then ask for the reason and if much delay can be expected. Fuel could be a consideration. Generally, when within approach range of your destination, vectors and descents are issued to enable the approach controller to sequence you into some established flow which is most orderly and expeditious if not totally direct. Any time your operation opposes or disrupts the flow, some factor of SOEFAT is sacrificed, if not for you then for someone else. This of course is not always unavoidable, and the system is compromised every day. There are more pilots of every description in the system every day. As the system becomes more complex, more is expected in terms of knowledge and professional ability of all users.

Because of these established flows at terminal approach facilities, controllers are programmed to maneuver all arrivals and departures so as to "go with the flow." There's nothing wrong with that except if you happen to be one of those descriptions of pilots who cannot conform to the established flow. If you happen to be driving a single piloted-high performance jet aircraft with one radio and TACAN ONLY, then you definitely are one of those very unique types and you best be sure that your controllers understand your situation; and far enough in advance for them to formulate some of that SOEFAT for you. True, the controllers have flight progress strips which give them most of that information: type aircraft/type equipment and destination. However, controllers don't realize that for you to transition from the high altitude structure to the Victor airways is tantamount to an emergency procedure.

Remember, you the pilot, have the same sucker punch as the controller, UNABLE! Consider the scenario of the single piloted-high performance jet aircraft TACAN ONLY (slant papa); enroute to NAS South Weymouth near Boston, filed to the NZW 178/8 for a HI-TACAN RWY 26 approach. Somewhere in

the vicinity of Albany (inbound from the northwest) you receive instructions to proceed "direct Chester direct Gardner V431 Lobby direct Maintain 8000." Decision time; accept or not to accept, this is the question. Are you prepared to comply with these instructions? There are many variables to consider: weather, nighttime, status of your Nav equipment, probability of radio failure, fuel, formation, alternate course of action if any phase proves not feasible. Although these are variables for you to consider, they are not for the controller. In this day and age, procedures based upon radio failure have gone out with high button shoes. *For who else but the military pilot is the dreaded radio failure a routine emergency?* The controller must assume that you are able to comply with what are to him routine amendments and restrictions.

So what can you do to avoid the dilemma of control actions that are contrary to your planned flight? Really only two things. Be *Unable* or be *Prepared!*

The *Unable* we've already discussed. It does not mean that you are incapable. If you are unable for any of the above considerations, then so state; Unable Victor airways, Unable due to weather, TACAN only, etc; and say what you can do or must do. This is for you only to decide.

To be *Prepared* these days, when this type of handling is routine, means to preflight with much more detail than ever before. If you're destined to a joint use facility or one in close proximity to any major civil aerodrome, even before you take off, you should be aware of the possibility of route restrictions. It is not enough to read the IFR Supplement, pick the most direct route off the HI chart and carry along the HI plates. This is incomplete planning. You'll agree that the professional pilot is always ahead of his aircraft. This means that he is prepared and always knows what to expect. Well this is also true of his flight planning. He should know what to reasonably expect during each phase of the flight.

Besides the above mentioned pubs for your destination, you should also familiarize yourself with what is published for the controlling facility. Standard Arrival Routes for Boston will pertain also to aerodromes controlled by Boston Approach. Familiarizing yourself with these procedures might assist you in planning the best arrival route for your destination. SIDS are equally important for all your departures. You'll seldom have to adhere to a full SID procedure, but it will at least get you into the established flow, from which you'll almost always get more direct routing. It is safer and more efficient for all to start out orderly and with some direction, receive the service and expeditious handling, than to start out in some shotgun fashion and build to chaos and confusion. Additionally, the same time and attention spent familiarizing yourself with the local area of your destination on the LOW charts is essential. Yes, it is difficult to transition from HI to LOW; if you are not *Prepared.*

Landing at NZW, I know that the chances of getting the HI TACAN approach are slim. Of course, if my mission requires it, then I'll not only request, but insist. They can't refuse. But I realize that NZW is in close proximity to Logan Airport, so I plan for the alternatives. If I know that I have to have the approach for weather or mission requirements, then I'll start making my request far enough out so that they have time to consider their picture and make any necessary coordination. And you can be sure that in proximity to any major terminal facility, any HI type approach is going to require considerable coordination (special handling). One thing here, if your request is for practice, you can be refused.

If your mission does not necessitate a HI type approach and or you are willing to accept rerouting in the LOW structure, then be prepared. By preflighting the LOW Charts and Plates you can at least make an educated guess as to what LOW NAVAIDS might be used for arrivals into the BOS area. With some familiarity with this area, and with my LOW chart marked and folded, it does not have to be an emergency procedure for me to make the transition. — Adapted from *Safety Sentinel,* 4th Marine Aircraft Wing. ■

Controllers want to give good service, but they can't always give pilots everything the pilots want.

A Collapsing

MAJOR GERALD A. WIELAND
Directorate of Aerospace Safety

■ Inadvertent landing gear retractions usually result from personnel not following technical data, and poor communications between workers. The A-10 mishap described below fit that pattern and resulted in almost $250,000 damage.

Here is what happened. Two aircraft maintenance specialists (43151) and an aircraft electrical systems specialist (42350) were performing a nose wheel steering (NWS) functional check on an A-10A with electrical and hydraulic power from the aircraft auxiliary power unit (APU). A portion of the check requires the landing gear handle to be raised to the "up" position. The landing gear safety pins were not installed, and the landing gear circuit breaker in the cockpit was not pulled out in accordance with technical data. When the landing gear handle was raised, the nose gear retracted, followed immediately by the main gear.

This mishap involved numerous instances where different people had an opportunity to prevent the mishap. None of them took the proper actions, and the typical mishap chain of events began leading to the end result—a damaged aircraft.

The chain of events was:

■ The pilot experienced nose wheel steering failure on landing rollout and stopped at the end of the runway area. The recovery checklist (TO 1A-10A-6WC-1) requiring landing gear safety pins to be installed was not complied with by maintenance personnel.

■ A qualified three-man towing crew was dispatched to return the aircraft to the ramp. The tow chief supervisor did not accomplish proper towing actions in accordance with the job guide (TO 1A-10A-2-4JG-1). The landing gear was not pinned.

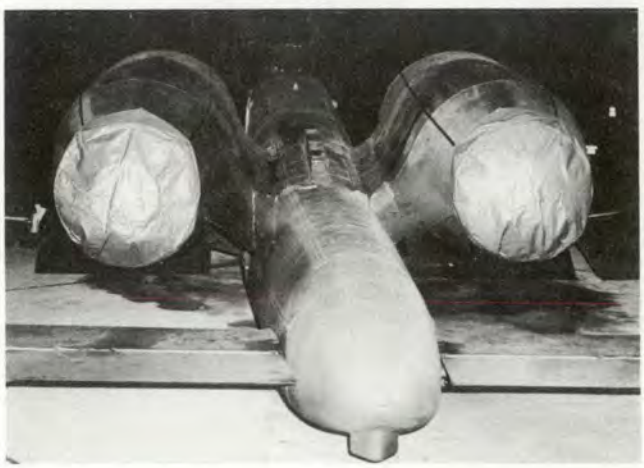
■ The crew chief did not perform the basic post-flight procedure in accordance with work cards (TO-1A-10-A-6WC-1). The crew chief did not check the landing gear pins, assuming this had been accomplished previously.

■ Two hydraulic specialists, assisted by the crew chief, removed the nose wheel steering unit. None recalls checking the landing gear pins in accordance with TO 1A-10A-2-32JG-3, which includes a general warning. "Insure landing gear system safe for maintenance."

■ The crew chief did not install the nose wheel slip plate IAW TO 1A-10A-2-32JG-3, "Operational Test and Adjustment of Nose Wheel Steering System" which includes a general warning, "Insure egress and landing gear systems safe for maintenance."

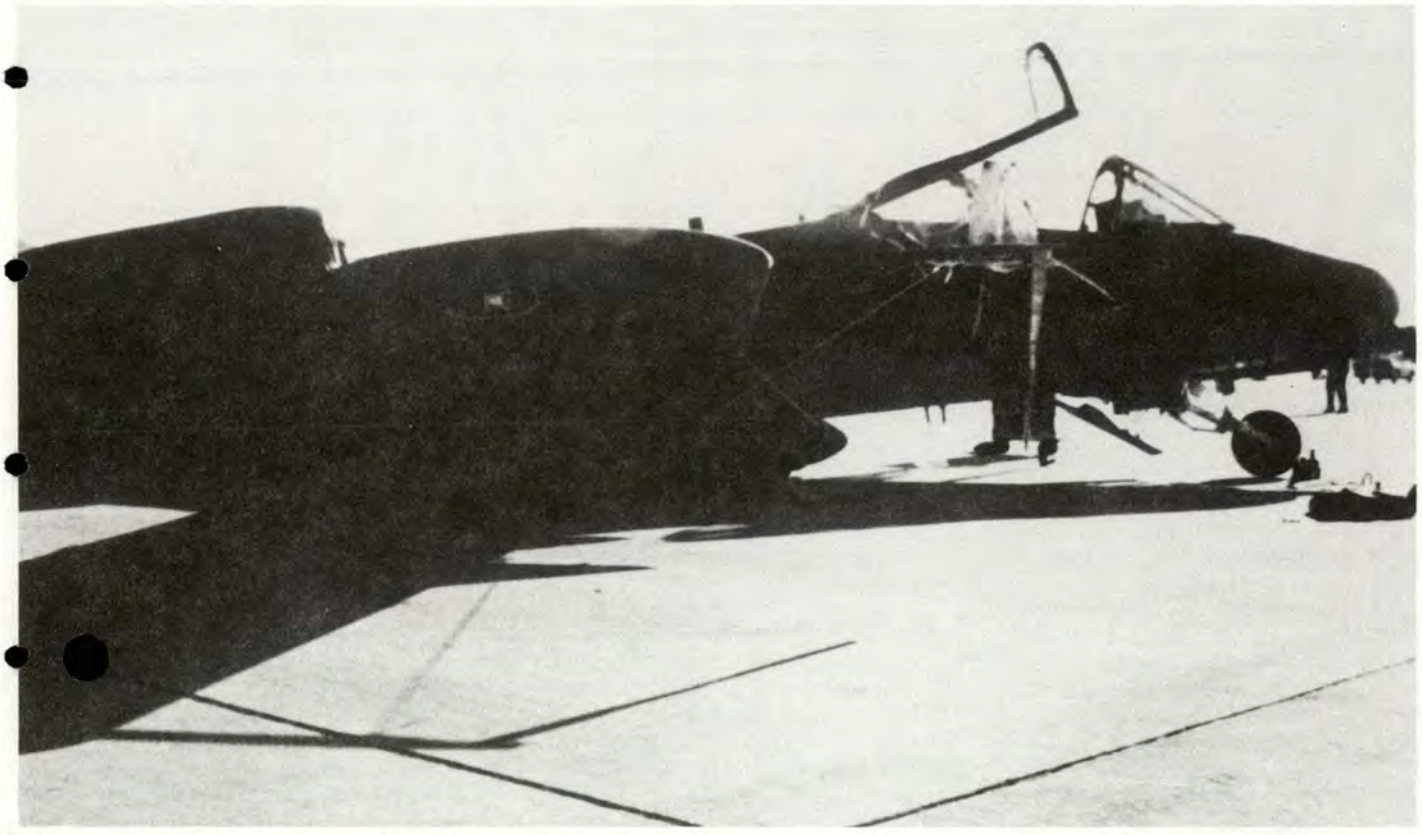
■ The crew chief did not perform an APU start in accordance with TO 1A-10A-2-71JG-2CL-1, which includes a general warning, "Insure egress armament, landing gear, and flight control systems safe for maintenance, and observe all danger areas during engine operation."

■ An electrician did not perform the nose wheel steering functional check



This A-10 was done-in by a number of people who could have prevented the mishap but didn't.

Situation



in accordance with TO 1A-10A-2-32JG-3.

- During the functional check, the crew chief was in the cockpit and the electrician was positioned near the aircraft. While following tech data, the crew chief asked if the gear was pinned. The electrician observed streamers on two of the three landing gear assemblies and replied, "yes." The crew chief asked again if the electrician was sure the gear was pinned. The electrician replied, "yes." The red streamers were attached to a ground wire and the 30mm gun safety pin and not the landing gear pins.
- While the electrician was calling out checklist steps, he failed to call out step 7, "Open Landing Gear Circuit Breaker on Essential Circuit Breaker Panel." The crew chief verbalized the landing gear lever was being positioned to "up." He was not stopped by the electrician.
- When the gear handle was raised, the gear handle light came on and the landing gear safe lights went out.
- The nose landing gear retracted followed immediately by the main gear.
- The landing gear safety pins were subsequently found stored in the left main gear pod—the normal position when stored for flight.

Numerous people could have prevented the mishap simply by following technical data. This is the same old admonishment that maintenance personnel have heard continuously throughout their careers—FOLLOW TECH DATA. In this mishap, the general warnings in tech data to ensure the aircraft was safe for maintenance were overlooked and probably assumed to have been accomplished by someone else. From a maintenance standpoint, it does no harm to carefully double check previously accomplished checklist steps. After all, Air Force operations are largely a team effort based upon all personnel doing the best job possible. When mistakes are made, good team work often can make corrections before a mishap occurs. As always, follow tech data—it will keep you out of trouble. If you are not sure of the applicable checklist steps, don't wing it, but check with a supervisor to find out the correct procedures. In short, take the time to do it right. ■

Editor's Note: This article is based upon initial information from the final progress report of the mishap. The AFISC final evaluation of this mishap has not yet been completed.

What's Your *SQ?

COLONEL RICHARD B. PILMER
Aerospace Physiology
USAFSAM
Brooks AFB, TX

*Smokers' Knowledge Quotient

■ With regard to available scientific information, smoking is not an intelligent practice. This does not mean that smokers are generally less intelligent; in fact, we once found that smokers know and score higher than non-smokers on a test involving scientific information about the practice! (*Aerospace Safety*, April 1973).

Smokers or not, you are all safety conscious or you wouldn't be reading this magazine.

In the way of an update, test yourself on these questions which were selected for their interest and potential for thought, argument and motivation.

TEST YOUR SMOKING QUOTIENT KNOWLEDGE

1. T F The National Institute on Drug Abuse (NIDA) found tobacco, in the form of cigarettes, an addicting substance.
2. T F Physicians, dentists, and pharmacists appear to be leading the downward trend in smoking.
3. T F No area of endeavor in American life offers greater opportunity for major disease prevention.
4. T F The most important specific health consequence of cigarette smoking in terms of the number of people affected is premature coronary heart disease.
5.* T F Carbon monoxide displaces oxygen, and smokers have from 2% to 15% more carboxy hemoglobin (COHb) in their bloodstream. (CO also damages circulation by making the walls of arteries more permeable creating edema (fluid) and opening the way to cholesterol deposits).
6. T F About 90% of lung cancer cases are related to smoking.
7. T F There has been a 400% increase in women's lung cancer death rates in the last 30 years.
8. Among successful quitters:
   T 1/3 gain weight
   F 1/3 lose weight
   1/3 remain the same
9. T F Nonsmokers live and love longer; smoking is now believed to be one of the causes of impotence.
10. T F The American Psychiatric Association lists tobacco dependence as a substance abuse disorder, and withdrawal as an organic mental disorder.
11. T F From behavioral studies of the sexes it was found that women more frequently smoke to reduce unpleasant feelings.
12. T F Women, more than men, will give up smoking if no one in their daily environment is a regular smoker.
13. T F Looking to the future, a number of airline officials anticipate continued expansion of aircraft no-smoking sections. Some foresee a possibility that smoking in the air may someday be an entirely forbidden practice.

You scored all thirteen statements correctly if you marked them totally TRUE

*Question five is of special importance to the safety of light aircraft pilots who operate without pressurization or oxygen equipment. Night vision capability of hypemic hypoxia may be adversely affected by elevated carboxyhemoglobin levels.

While smoking has not been identified as a causal factor in general aviation or Air Force accidents, it is believed that smoking may indirectly be related to incidents and accidents because of physiological effects, distraction, and possible instrument or equipment malfunctions.

To pass laws or implement regulations to prohibit all smoking in cockpits might create situations of withdrawal symptoms that would cancel the anticipated gains in safety.

To crusade for elimination of all smoking anywhere is as unreal as to ask an addicted smoker to quit forever on the same day he (she) has consumed a pack of cigarettes.

While cleaner air and aircraft are ideals worth working for, moderation, smoking cessation education, aerobic and fitness programs, and pharmacologic approaches to nicotine replacement seem to be the most logical approaches to the problem at this time.

Americans quizzed as to their reasons for quitting smoking most frequently cite this motivation:

"Mastery of my own life."

Perhaps our collective survival as a nation will involve greater security and safety by making Americans tougher through more scientific health practices. ■

References
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2. World Smoking and Health. American Cancer Society Journal, Vol. 5, No. 3, Fall 1980.
3. Aviation Space and Environmental Medicine, February 1981, Vol. 52, No. 2, The Effects of Tobacco on Aviation Safety, J.R. Dille and M.K. Linder.

DENSITY ALTITUDE

■ Pilots, your attention, please, to a seasonal reminder of a potential hazard in warm-weather, high-altitude flying, courtesy of the NTSB.

High ''density altitude,'' which such flying involves, was cited by the Board as a cause or contributing factor in 36 of the 301 accidents reported in its sixth issue of ''briefs'' of 1979 civil aviation accidents. The brief format is a computer printout of the Board's determination of probable cause and contributing factors, and the basic facts of an accident.

Airplane performance decreases as temperature increases. Higher altitudes further decrease performance. In hot weather, an aircraft at a given pressure altitude will actually perform as though it were much higher. This is the effect of ''density altitude.''

In one of the 36 accidents involving density altitude, a single-engine airplane on a pleasure flight in Colorado crashed just below the ridge of an 11,910-foot-high mountain pass. Both pilots and a lone passenger died in the crash and ensuing fire.

A hiker who witnessed the crash said the airplane flew up a canyon toward the pass at a very low altitude. He said the engine ''appeared to be struggling,'' but there was no smoke or fire. The plane ''made it to almost the top of the pass,'' then turned as if to reverse course just before it crashed.

Safety Board investigation showed no evidence of preimpact malfunction or failure. Temperature conditions created a density altitude of about 14,000 feet—more than 2,000 feet higher than the actual elevation of the pass.

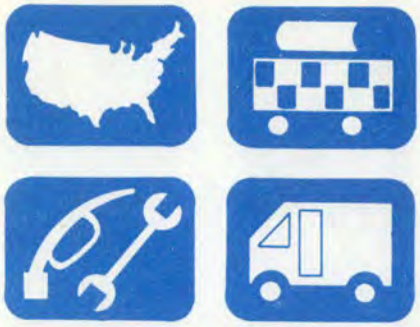
The Safety Board held that the accident was caused by the pilot's misjudging distance, speed and altitude, with flying into a blind canyon and high density altitude as contributing factors.

''High density altitude can be an insidious hazard when a pilot forgets it entirely, or forgets that it does not take much warmth to seriously degrade the performance of an airplane which is taking off from an airport in high mountains, or traversing unusually high terrain,'' the Safety Board said in its volume of accident briefs. ''The temperature in this case was only 50 degrees.''

''By noting altitude and temperature, both at takeoff and at cruise altitude, the prudent pilot will calculate what his density altitude—and thus his aircraft performance—will be.

''Density altitude at an airport with a weather station can be obtained from the weather observer. En route, it can be calculated with altimeter and outside air readings using a flight computer.''—Adapted from *ATC Approach To Safety*. ■

Don't let all that thrust your bird has fool you. All aircraft are subject to the law from which density altitude is derived—the most powerful fighters to the smallest light plane. It shouldn't be a problem, though; the info you need to cope with the air at any temperature or density is in your handbook. Use it!—Ed.



X-COUNTRY NOTES

MAJOR DAVID V. FROEHLICH

THE PROGRAM

■ We're still receiving a lot of calls asking how a unit goes about nominating or applying for the Rex Riley Transient Services Award. Let me take a few moments to re-emphasize some of our program guidelines:

BACKGROUND—The Rex Riley Transient Services Award program was established in the early 1950's to recognize Air Force installations providing outstanding service and facilities for transient aircrews. Although enjoying several different names over the years, the program has survived and still serves as a mark of distinction for Air Force airfields throughout the world. The goal of the program is mishap prevention through the recognition and improvement of USAF transient services.

PHILOSOPHY—We feel that one of the mainstays of any installation aircraft mishap prevention program should be the facilities that are used by transient aircrews. Not only are we interested in the obvious flight line hazards and operations, but we also attempt to evaluate (and improve) facilities which could be classed as irritants. These include flight planning, messing, transport, billeting and other areas which could directly, or indirectly, affect aircrew frame-of-mind or fatigue levels. In short, we are targeted to seek out and bring attention to any condition which could increase the probability of a mishap.

ELIGIBILITY—As a minimum, bases must meet the following criteria in order to be eligible for evaluation under the Rex Riley Transient Services Award program.

- Active USAF, AFRES or (AF) ANG installation, listed in the IFR supplement as possessing facilities to serve transient aircraft and crews.
- Available hours to transients a minimum of 8 hours per day and five days per week.
- Have no continuing OBO or other major limitations to transient aircrew arrival or service. (NOTE: PPR status is not an automatic ineligibility factor. Many installations are using PPR as a valid management/sequencing tool. A permanent PPR restriction will be evaluated by the Rex Riley program director for determination of eligibility.)

ADMINISTRATION—The award program is administered by the Safety Education Division of the Air Force Inspection and Safety Center. Although not a formal IG-type inspection, the evaluations are carried out on a no-notice basis using extensive checklists. Evaluators basically look at such areas as Base Ops facilities, billeting, availability of meals and transport, and transient servicing and maintenance. The goal is to visit/revisit every Air Force base serving transient aircrews within recurring 2-year periods.

ENTITLEMENTS—Units selected for the Rex Riley Transient Services Award will be added to the award lists published in *Flying Safety* and *Maintenance* magazines. They will remain on the list and move upward as seniority is increased.

In addition, a certificate suitable for Base Ops display will be forwarded to the commander of the unit responsible for airfield management. (mini-certificates for other base agencies are available from "Rex" upon request.)

Transient alert personnel are authorized to wear Rex Riley patches at the unit commander's discretion. Standardized design is provided but units are responsible for the local procurement and expense of patches should they be desired. REMOVAL—Bases having the award removed will receive a letter of explanation, and the base's name will be deleted from the next list published. Removal will result from:

- An unsatisfactory evaluation.
- The advent of continuing or permanent restrictions published by a base which severely limit the

availability of services to transients. (As determined by the Rex Riley program director.)

- Transient Alert personnel are involved in a mishap or allow a safety of flight item to go uncorrected.
- A base is transferred to a different MAJCOM or TA changes status (i.e., military to civilian, contract, etc.).
- A base is closed.

HONORABLE MENTION

When out on evaluation trips we often stop at places that aren't eligible for an award but are obviously interested in providing safe, quality services for aircraft and crews. We'd like to pass on Rex Riley thanks to:

NAVY DALLAS—These folks have always provided us with safe, quick turn arounds when we needed a place to stop.

FORT CAMPBELL, KY—Lots of ramp space, facilities and they even called Rex to say "Y'all come." Put them on your list as a good place to stop for service if you're heading either direction across the country.

INTEREST ITEMS

FLY SAFE BULLETIN BOARD—Lots of Base Ops we visit have a flying safety bulletin board—but many of them are just tokens. This is a super place to catch the eye of transient crews and local flyers, but it's wasted if the items posted are antiques and an eyesore. Get your bulletin boards into shape—make 'em eye-catchers and pack 'em with good info to keep flyers a little safer.

PREFERRED DEPARTURE ROUTES (PDRs)—Many places are working out these PDR's for smoothing local and transient traffic. Two problems are present—the PDRs may not be seen or if they are seen, they may not be used. Ops folks—make sure they're prominently posted and emphasize their use! Crews—check with dispatch to see what the best routes are! That short step may save you time, gas and clearance copying.

QUESTIONS

We've received phone calls about the bases currently on the Rex Riley list. We've verified our records and this (at right) is a correct list of bases entitled to the Rex Riley Transient Services Award. Inquiries pertaining to the Rex Riley Transient Services Award program should be addressed to: AFISC/SEDAK, Norton AFB, CA 92409 or AUTOVON 876-2113. ■

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
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 AFB	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
DYESS AFB	Abilene, TX
AVIANO AB	Italy
BITBURG AB	Germany

SO NOW YOU'RE AN INSTRUCTOR PILOT!

MAJOR DONALD E. YARBROUGH

■ So now you're an instructor pilot! You've completed all the tests, passed your check ride, and been certified by your commander. Your prestige has just jumped up a notch or two, and you're probably well satisfied with your accomplishment. Rightly so. However, are you aware that, historically, IPs experience about 15 per cent of our operations factor mishaps?

"Why," you ask? "I'm more proficient, more knowledgeable and more qualified than ever before. I should be less likely to be involved in an accident."

You're right, you should be safer than the average bear, but the statistics show that isn't the case. IP's have their own special place in the accident stats. For a lot of reasons, you could be another

instructor-involved accident just waiting to happen.

"Oh yeah, you're going to tell me about increased exposure and all that. I've read about how instructors are exposed more often and for longer periods of time to the more hazardous phases of flight than anyone else. That must be what you're driving at."

Well, yes, increased exposure is one of the things I had in mind.

There are several others, too, if you're interested?

"Go ahead, over."

Thought you'd never ask. You see there are a number of hazards that an instructor must live with that don't affect the average crew dog. There are others that affect both, but are felt by the instructor in a different way. It's these hazards that are peculiar to the IP's task that you need to know about. They have been discovered the hard way by your instructor and his instructor and his instructor before that.

You've already mentioned exposure. Along with increased exposure goes *fatigue*. Fatigue brought on by an instructor's constant high level of physical and mental activity is the particular kind of fatigue I'm talking about. The instructor pilot on board any aircraft feels responsible not only for his activity but for the actions of everyone else as well. He must be constantly paying attention to the actions of the student and all the while making sure that essential tasks are performed correctly. The stress brought on by increased activity causes the instructor to become fatigued faster than anyone else on board.

You're aware, of course, of how fatigue can have an adverse affect on one's judgment, perception and reaction time. Here's our IP on final approach at the end of a six hour pilot-pro: He's thirsty, hungry and his bladder is about to burst. His students have been in and out of the seat for relief a couple of times or more, but not our IP. He's been too

busy minding the store and keeping the whole ball of wax together. Think about it.

Then there is a special hazard I like to call the *Student Syndrome*. It's a fancy label for a type of mental set experienced by a student when he's flying with an IP. He

tends to depend on the oldhead IP to make, or at least review, the decisions that are made. He will sometimes do things with the airplane that he would never do if he weren't "backed up" by the IP. His decision making process is almost always altered by your presence. He nearly always considers what he thinks you want before he reaches a decision on anything. All this flip flop thinking takes time. Here he is closing on the tanker: *Damn, I've never closed this fast before, but my IP doesn't seem to be worried.* Meanwhile, our IP thinks: *Looks like a high rate of closure to me, but I'll wait a little longer to see if he corrects*. Think about it.

Complacency is a tender trap that has killed many aviators, but it has a special meaning for instructor pilots. It's the root of that old saw, "It's the good student that will kill you." You can be lulled into complacency by a pilot who has been showing you a flawless performance. You may forget why you are on board. It can be a temporary, but fatal, memory lapse. Think about it.

Most of the time while you are

flying as an instructor you will really just be watching. The other guy will be moving the controls. It is possible for him during critical phases of flight to make control inputs so quickly and so wrongly that recovery actions, even if initiated as quickly as is humanly possible, may not be soon enough to avert disaster. This is a *control environment* that you live in as an instructor. Guard the controls, expect that other guy to make mistakes with them, and take the airplane at the first sign of a deteriorating control environment. Consider, also, that each time you change students the control environment will change. You must adapt to that change. Adapting places stress on you. The more frequent the change the greater the stress.

Overzealousness has taken its toll of eager young instructors. They want to do such a fine job, are so concerned that their student gets the full benefit of their expertise, that they completely overlook routine actions. Here's the overzealous instructor: He's talking his pilot through one of the best ILS finals the world has ever seen. Right on glide slope, the VVI is painted on,

continued

power changes are minute. He is giving verbal encouragement and is reenforcing the learning process of the student by earned praise in the best possible manner. The only thing wrong is our instructor has forgotten to put the rollers out! Think about it.

Pressure is one of the seldom mentioned items that can start you down the primrose path. Real or imagined, it makes no difference. It makes you do things you wouldn't

ordinarily do. It can come from many directions to force you into a coffin corner. From scheduling: "Get this guy his night heavyweight or you're going to be pulling alert for him next Thursday." From the command post: "The DO wants you to try those flaps a few more times because he thinks it's an electrical problem and not a jammed segment." From the student: "Isn't the weather good enough for just one more approach, sir? I need it to finish my upgrade requirements." From yourself: *I've got to show this guy the superb skill that makes me an IP*. Think about it.

After a year or so of instructing you might feel like you've seen and done it all. You've had your share of hairy recoveries, you've seen all of the mistakes the students make time and time again. Because of your frequent flights as an IP you have honed your flying skills to a razor's edge. You take great pride in demonstrating aerial maneuvers with

flawless precision. There is still one little hazard that may trip you. OVERCONFIDENCE. Think about it.

Up to now I've been busy giving a lot of reasons why instructor pilots are involved in more than their share of accidents. Really, though, these things don't *cause* the pilot error accident that I'm talking about. The accident in which the instructor and student let a flyable machine make unscheduled ground contact is caused by DISTRACTION. All the things I've talked about so far are only some of the many ways an instructor pilot can become distracted. Distracted from what? From flying the airplane, of course.

Now, there is another aspect of flying and flying accidents that you might consider. It deals with a characteristic of humans called emulation. By that I mean that some of your attitudes will rub off on your students. Your attitudes toward professionalism, safety, and air discipline are particularly important for your student's continued safety. If you, by word or deed, show him that rules are made to be broken, that attitudes of "safety first" are to be sneered at, or that bravado is a substitute for disciplined airmanship, you may be setting him up for disaster at some point in the future.

The more impressive and liked you are as an instructor the more likely your students are to acquire your attitudes. Probably, no one will come back to you with an accusing finger after a former student of yours bites the dust, but you'll have to sleep nights, won't you? You'll be asking yourself questions like these: "Did I teach him everything I could in the time I had available?" "Was he emulating me and my attitudes towards safety, discipline, and airmanship when he crashed?" Think about it.

I don't have all the answers for you. I don't suppose anyone has. I do, however, have a few broad guidelines that I think will improve your chances of collecting your retirement.

- AVOID SURPRISES.
- FLY ONLY AIRWORTHY EQUIPMENT.
- KNOW YOUR PROCEDURES, AND INSIST THAT EVERYONE YOU FLY WITH KNOWS HIS.
- AVOID THE PITFALLS THAT LEAD TO DISTRACTION.
- FLY THE AIRPLANE.

THINK ABOUT IT.—Reprinted from *Aerospace Safety*. ■

Pilots Get Paid Extra

MAJOR MICHAEL T. FAGAN
Directorate of Aerospace Safety

■ There are many stereotypes of pilots which, while gratifying to the aviator, need some examination. "When I grow up, I want to be a pilot . . ." begins one humorous essay, allegedly written by a schoolchild. "Crooked smile, straight teeth . . .", said Shelley Berman. The steely-eyed fighter jock stares out from recruiting posters, the very picture of a trained defender of truth, justice, and the American way. From the scarf-in-the-wind Sopwith pilot to the confident, smiling astronaut there are many images which say "PILOT." Some are simply not valid.

Wouldn't it be nice if beautiful women really did fall at the feet of pilots? (Or beautiful men at the feet of aviatrixes?) Sad to admit, not all fighter pilots have hollow legs, and dental anomalies are probably as common among airplane drivers as they are among the general population. Real Air Force pilots have been wearing black socks for so long that a matching pair of any other color is considered pretty sporty apparel. The real MAC line pilot is distinguished, not by his boyish grin and unshakable air of confidence, but by his (or her) plastic spoon, P-38 can opener, and bag of dirty laundry.

There is one commonly held opinion which may improve our social success at the bar, but which can lead to problems if we begin to believe it ourselves. It is the concept that we are paid extra because the job is dangerous. A risk-taking, danger-scorning image may impress MOS's (members of the opposite sex), but will not attract the favorable attention of the boss or the safety officer. The fact is that we are *paid* extra to exercise extra *responsibility* and keep the job from becoming dangerous.

Responsibility is the key word. A pilot has, along with the task of getting the job done, an equal responsibility to prevent anything untoward from happening to the equipment, including his or her fit-and-fair young body. Events which don't happen are hard to count. Events which are easy to count, like aircraft accidents, easily attract attention. Non-events tend to go unnoticed. Non-accidents are rarely applauded.

Every day pilots face situations which would lead to an accident if left to themselves, meet those situations, and "take proper corrective action." Some are as simple as taking it around when the approach got fouled up by an errant gust of wind or an uncontrolled truck crossing the runway. Some are cases of coping with a major emergency in a timely or even imaginative manner. Once in a while somebody up the chain will notice and the pilot responsible for not having an accident will receive the proverbial "attaboy." But most of the time, he just gets his flight pay and a new "There I Was" story to add to his repertoire.

The attention-getters are the cases where the pilot did not have an uneventful flight and could or did not prevent an accident. Sometimes it is a matter well beyond his or her control; catastrophic failures, etc. Sometimes, however, it is a case of a pilot not practicing responsibility to prevent an accident. Especially disturbing are incidences of failure of the pilot-in-command to remain in command of the situation.

continued

Pilots Get Paid Extra

continued

The following examples of failure to remain in control are paraphrased from *Flightfax,* the excellent US Army flying safety bulletin, Volume 9, Number 23, 25 March 1981. While they are examples of helicopter mishaps, the lessons to be learned apply to a wide variety of aviation situations.

A UH-1 helicopter was participating in terrain flight. The copilot was on the controls while the aircraft commander was reading the map. At about 100′ AGL, the copilot entered a steep right turn during which the aircraft lost altitude and the rotor blades struck the treetops. The crew made a precautionary landing to a field without further incident. Investigation pointed to a lack of crew coordination as contributing to this mishap. The two pilots were not communicating with each other as to obstacles and terrain hazards. The copilot made the turn without the direction of the aircraft commander, and further, did not ask the AC (in the right seat in helicopters) to clear the right turn for him. While the pilot at the controls created the situation which resulted in aircraft damage, the ultimate responsibility for the safety of the aircraft rested with the designated pilot in command. He took no positive action to be in charge of the flight.

In another instance, the mishap aircraft was one of four redeploying from a mission over mountainous terrain. The first leg was uneventful but while on the ground, the weather deteriorated to the extent that instrument departures would have to be made to continue the flight. Although the pilot of the accident aircraft met PIC (pilot-in-command) qualifications, he was relatively inexperienced. Instrument takeoffs had been his weakness during flight training. While he was reluctant to try the instrument takeoff, he didn't want to delay the flight. After some discussion with the mission commander, the inexperienced pilot waived his prerogative to stay on the ground and chose to attempt the takeoff. During the departure, the aircraft lost altitude and hit a large tree located on a ridge. Both pilots were killed and the aircraft destroyed.

In each of these cases, peer/superior pressure may have been a factor. In the first, the copilot was also the platoon leader. In the second, desire to press on with the redeployment with the rest of the unit may have induced the pilot to take the wrong action.

A third example, also from *Flightfax,* tells how a perfectly healthy aircraft was destroyed simply because the aircraft commander failed to ensure that each crewmember tended to their specific responsibilities and communicated during flight. Even though no "real emergency" arose, lack of communication between the pilot and copilot resulted in antics that are reminiscent of the Keystone Cops.

At an altitude of 4,000 MSL, the aircraft commander chose to reduce rotor rpm, allegedly to conserve fuel. Why he felt this was necessary is not clear; the aircraft had ample fuel to complete the one-hour flight. Weather deteriorated as they approached the field and they were picked up for a GCA. At about 900 MSL, in the weather, the crew got a low rotor and engine rpm warning. Promptly, the pilot began to remedy what he thought was a simple

beeped down rotor rpm setting. With the throttle in the full on position, he lowered collective.

Meanwhile, the copilot misinterpreted the low rpm as low side governor failure. Without telling the aircraft commander, he switched the governor to the emergency position. The combination of pilots and copilot's actions resulted in a severe overspeed which demanded immediate corrective actions.

The aircraft commander compensated for the overspeed by adding collective and rolling off the throttle. While he was doing this, the copilot, realizing his earlier error, reconsidered his decision to place the governor switch in emergency and put it back in the automatic position—again without telling the aircraft commander.

Responding to the now low rotor rpm, the AC initiated a forced landing. At 20 to 30 feet AGL, he decelerated but did not apply power until ground contact. Perhaps he did not realize that it would be there. In any case, the aircraft bounced back into the air, he lowered collective and the aircraft hit again, he pulled collective up, and the aircraft became airborne a third time, and he finally put it on the ground in an upright position. All occupants escaped with minimal injuries, but the aircraft was destroyed. Throughout the accident sequence, the aircraft was responding to aircrew inputs exactly as it should have.

A recent Class B mishap in Air Force helicopters demonstrates that such confusion is not limited to our sister service.

The mission was an initial upgrade checkride, successfully completed. Before terminating, the check pilot decided to demonstrate a little technique in autorotations. Autorotation was entered and the speed selectors (throttles) were retarded by the flight engineer, as usual. Normally, the pilot flying the maneuver will call for them to be advanced during the flare and the pilot not flying would advance them. The flight engineer serves as a backup, especially with students on board.

This time, the instructor did not call for the speeds to be pushed up, and the pilot not at the controls, perhaps still heaving a sigh of relief over a successful check, did not do so automatically. The flight engineer had been admonished for advancing them without the pilot's orders on a flight a few days earlier, and was not anxious to repeat that process. In any case, the pilot realized his omission too late and elected to continue the autorotation to touchdown. Then the flight engineer decided to take action and he slammed the copilot's hand and the speed selectors full forward. As the aircraft touched down, the rotor regained power and the aircraft became airborne again. As the pilot attempted to gain control, the aircraft came down in a yaw, became airborne again, and finally came to rest about 200 feet from the point of initial ground contact, suffering structural damage in the process.

No one is more aware than an aviator that anything that can go wrong eventually will.

In each of these cases, and any number of others in all types of aircraft, the aircraft commander somehow lost control of the situation, or failed to exercise his responsibility to remain in charge.

No one is more aware than an aviator that anything that can go wrong eventually will. Pilots are not only responsible for not allowing themselves or other crewmembers to induce unsafe situations, like the defensive driver, they are responsible for successfully dealing with the unexpected. Most pilots do routinely. All pilots do it most of the time. Those are the cases we never hear about except over a beer during a hangar flying session. But some pilots occasionally fail to exercise their command authority and responsibility, and the result is a mishap.

The individual most responsible for the safe conduct of the mission is the pilot. He must not only do the job without creating risks . . . he must counter all manner of risks that the complexity of the task and the predisposition of the equipment to obey Murphy's Law thrust upon him. Even if he does not cause a mishap, he is the last person with an opportunity to prevent one. That's why pilots get paid extra. ■

THE INSIDIOUS KILLER

can strike any pilot. Its onset may be hardly noticeable, but your condition can deteriorate rapidly. It affects your ability to function and many times results in total incapacitation. You become confused to the point that coordinated muscular movement is impossible. Experience has shown that without help you will die within a matter of minutes. The insidious killer is spatial disorientation!

■ Spatial disorientation Class A mishaps are usually fatal. Twelve of the last 16 mishaps in this category resulted in aircrew fatalities. Single-seat aircraft or aircraft being flown solo accounted for 10 of the 12 fatal mishaps. One of the two fatal mishaps involving aircraft with multiple crewmembers was a helicopter that crashed while attempting to take off in white-out conditions. The other was a two-seat fighter that crashed shortly after takeoff. Other than the helicopter, all aircraft involved in fatal mishaps were equipped with ejection seats. However, there was no attempt to eject in any of the mishaps. Two of the four non-fatal mishaps involved dual-place airplanes. In both cases, the pilot was ejected by the rear seater.

The loss of four F-15s and their pilots in a 2-year period was

LT COL EUGENE G. LaMOTHE
Directorate of Aerospace Safety

attributed to disorientation. A lot of effort has gone into trying to determine why, and a number of reasons have been given. Among these are the bubble canopy, the lack of tactile feedback through the flight controls, the high roll rates attainable, the lack of "wind in the wires" and aircraft lighting. Are these causes valid; are they applicable to other new fighters such as the F-16? It is difficult to tell because our records here at the Safety Center indicate only one F-15 and one F-16 Class C disorientation incident in the history of each aircraft!

The Barany chair and the Vertigon will convince you that anyone can become disoriented. If the aircraft you fly is conducive to disorientation, we need to know that. More importantly, we need to know why it is conducive to disorientation. Then we can justify meaningful research and modification programs.

Some efforts are underway in this area. Two programs that should reduce disorientation mishaps are the Vertifuge trainer and the Peripheral Vision Horizon Display (PVHD). The Vertifuge consists of a small cockpit mounted on a centrifuge that can generate approximately one transverse G. It goes a step beyond the Vertigon in that the pilot controls the trainer and can practice recovery once he has become disoriented.

A better idea is to provide the pilot sufficient cues to prevent disorientation in the first place. An instrument that holds great promise in this area is the PVHD being developed by Dr. Richard Malcolm—hence the name Malcolm Horizon. The concept is to provide attitude information to the pilot through his peripheral vision using a laser light attitude bar projected across the cockpit. This horizon would extend across the whole instrument panel and free the central vision from monitoring the ADI. It is the peripheral vision that normally provides orientation cues. To prove it, roll this magazine up into a 1-inch tube, stand on one foot, close one eye, and look at a blank wall through the tube with the other eye. With the tube close to your eye, blocking your peripheral vision, you will start to sway and lose your balance. Now tilt the tube slightly and move the tube an inch away or so from your eye so as to block central vision while uncovering peripheral vision. You immediately regain your balance and orientation.

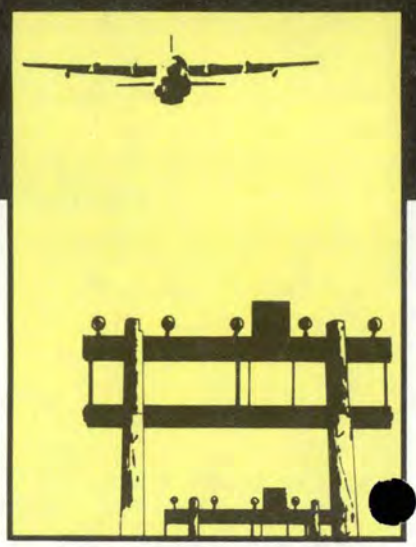
The Vertigon and Peripheral Vision Horizon Display are under development, but will they be the answer to spatial disorientation? We need more information on your disorientation experiences.

The strength of these peripheral vision cues is very apparent in advanced simulators with wide field of view visual presentation. The illusion of motion in the roll axis is tremendous even though you know you're sitting still. With a Malcolm Horizon, the pilot can assimilate attitude information with peripheral vision and monitor instruments that must be read with his central vision. This will significantly reduce pilot workload during night, instrument, high altitude, and tactical maneuvering flight without a distinct outside visual horizon reference.

The Vertigon and Peripheral Vision Horizon Display are under development, but will they be the answer to spatial disorientation? We need more information on your disorientation experiences. If you don't feel it warrants an incident report, just drop us a line here at the Safety Center.

Remember, anyone can become disoriented, and it's hard to force yourself to give up. If you ever get to the point where you feel someone else is pushing on the stick and the airplane is not responding to your inputs, do one thing right. Pull the handle. Too many good guys have become victims of the Insidious Killer while trying to get on the gages. ■

LOW ALT
BIC200
007 16



BLUE FOUR, LOW ALTITUDE...

MAJOR WILLIAM H. BOSLEY, USAFR • 919th Special Operations Group • Eglin AF Auxiliary Field No. 3, Florida

■ One dark night in March, Major Pete Gunn, 919 Special Operations Group, was driving his AC-130 Gunship toward Tampa, Florida. He asked Tampa approach control to clear him for a practice localizer back course approach to runway 35 right at Saint Petersburg-Clearwater International. Approach said O.K., gave Pete radar vectors to final and a handoff to tower at the final approach fix. Pete hit the fix and started down.

When he was two miles from the airport, tower called with a low altitude alert. "Wassa matter?", thought Pete. "Still 50 feet to minimums." The ensuing spirited discussion led Pete to conclude that the Defense Mapping Agency had given him some bad information on the approach plate.

Being the conscientious guy he is, Pete turned in a Hazardous Air Traffic Report (HATR) when he got back to home plate later that night. As safety guy, I got to meet some interesting people and learn a lot during the investigation.

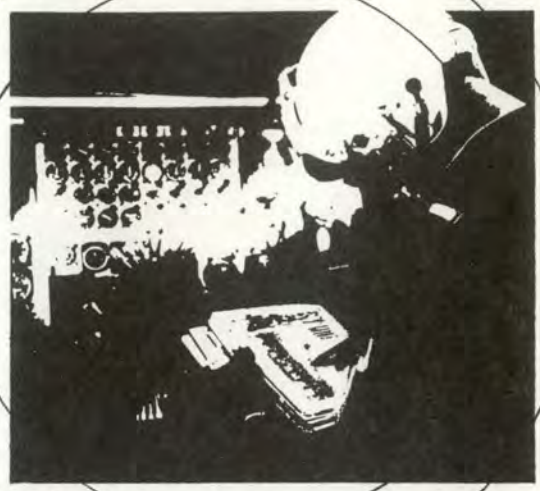
The first thing I found out is the approach plates are O.K. Then, I learned lots about the FAA's new warning system. They call it Minimum Safe Altitude Warning, or MSAW. It's a good system and should reduce the supply of rich widows, but it's got some limitations that few pilots understand.

MSAW is really just a computer program that augments the FAA's existing Automated Radar Terminal System (ARTS III). The Air Force's equivalent system is called Programmable Indicator Data Processor (PIDP). Both systems give the controller a computer generated alarm based on projected impact with the ground or some fixed object, not based on approach minima. The alarm is in the form of the words "LOW ALT" flashing above the data block on the controller's scope, and a beep tone on a speaker.

In Pete's case, the computer issued a warning because it projected touchdown short of the runway. The projection was based on the high rate of descent Pete used to get to minimums. A low altitude warning is not unusual during a nonprecision approach and serves as a caution to the pilot. It simply says, "*If you keep doing what you're doin' now, you're gonna be in trouble*. Be sure you're right."

If you are under control of an agency with ARTS III or PIDP and if you are squawking altitude, you've got low altitude warning service. It's provided to all IFR aircraft and on request to VFR aircraft. ■

A report by NASA on its Aviation Safety Reporting System contained a detailed treatise on "Distraction—A Human Factor in Air Carrier Hazard Events." Most of the findings apply equally to military aircrews. Following is a digest of the study from *Flight Focus*.



Cockpit Distraction

■ The study of air carrier pilot distractions emerged from the fact that in the numerous reports made to the ASRS by pilots, one phrase appears with considerable frequency: "We were distracted by . . ." NASA researchers identified a total of 169 specific distraction events from among the reports they had received and found that the enabling or associated causes for these events fell into two distinct categories:

- Non-flight Operations Activities; i.e., company-required tasks such as P.A. announcements, on/off blocks messages, logbook paperwork, flight service/passenger problems, etc.
- Flight Operations Tasks; i.e., routine duties normal to every flight such as running checklists, looking for traffic, communicating with ATC, handling minor malfunctions, monitoring radar, etc. An overlap of any combination of these tasks in a short period of time frequently triggered a distraction event which was often quoted in ASRS reports in association with "excessive workload" situations.

Both categories of distraction were found to compromise the safety of flight operations in two separate ways:

- An essential task was not accomplished.
- Crew coordination or crew management was impaired, and the loss of organized teamwork often caused attention to be diverted from flying the airplane.

In analyzing the causes of distraction, researchers recognized that cockpit priorities for routine task accomplishment followed consistent patterns. However, during "excessive workload" peaks, while checklists were always accomplished, radar monitoring continued and minor malfunctions were handled, such things as routine traffic watch and ATC communications (especially at tower hand-off) apparently become lower priority items which were occasionally not accomplished in time to avoid an unsafe occurrence. In contrast, when a radar advisory on other traffic was received, making visual contact with that traffic was given the highest priority—so high, in fact, that crew management lapsed and coordination failed. It's interesting to note that most reported distraction events involved an interrelationship with the ATC system.

If, due to distraction, one crewmember is removed from the operational loop, then a vital cross-checking function is eliminated, making the operation vulnerable to the commission of error. Such an error, it is said, would become more than a link in a chain of events; because it can remain unchallenged, it may become a factor ready to combine with other pertinent coincidences.

Non-Operational Distractions

PAPERWORK—In all reports characterized as paperwork distractions, it was found that the captain was the individual distracted from monitoring the flight path as being flown by the F/O. All incidents reported involved deviations from altitude clearances and all of them were ended by radar challenges. Identified as the "administrative tasks" which caused distractions were such things as filling out logbooks, engine readings, on/off times and perusing a sigmet chart. With all incidents occurring during climb or descent, this highlights a point recently made recommending the limiting of activities below 10,000 feet to "panel scans, system operational duties and traffic watch."

P.A. ANNOUNCEMENTS—In this category it was found that the removal of the captain from the ATC communication loop was a factor. Reports alluded to misunderstood or misstated clearance

Cockpit Distraction continued

PHASE OF FLIGHT		RESULTS	
Climb checklist	7	Altitude deviations	9
Descent checklist	6	No landing clearance	6
Landing checklist	6	Took another aircraft's clearance by mistake	2
Taxi checklist	3	Unauthorized entry into active runway	3
		Failure in see-and-avoid concept	2
TOTAL	22	TOTAL	22

Table

altitude assignments by the F/O, which then continued unchallenged into an "altitude bust" usually discovered by radar monitoring. Reports on instances of misinterpreted altitude clearance messages rarely made mention of any clearance readback to confirm an altitude change with ATC.

CONVERSATION — Reports in this category note that all cockpit conversations resulting in a distraction incident were relevant, that is they dealt with operational matters; fuel load, time to descent, engine malfunction, etc. Weather was never noted as a factor. Several reports made reference to line-type instructions being offered by the captain. Two incidents centered on distractions due to check-airmen discussions. Worth noting is that when talking to each other, neither pilot was monitoring the aircraft path. Of the nine conversation distractions, seven produced "altitude busts," i.e., descending through the assigned altitude.

FLIGHT SERVICE — In this category, most reports described descent phase occurrences involving discussion with flight attendants about travel connections, cabin situations and general passenger problems. Diverted attention produced misread altimeters, overshooting or undershooting of altitude crossing restrictions, etc., procedural mistakes that secondarily involved intracrew communication failures. An amended clearance or a new altitude assignment acknowledgement may have been given to ATC by one pilot but the information was not passed to the other pilot.

COMPANY RADIO COMMUNICATION — Reports in this category indicate that in all but one of the sixteen documented events, deviations from ATC assigned altitudes occurred. Five of these were due to misunderstood ATC communications, nine involved errors in which the pilot flying "inadvertently" departed altitude without this being noted by the pilot-not-flying, while the latter was engaged in company transmissions. In six of the nine events the pilot-not-flying belatedly recognized the altitude deviation before ATC radar intervened. One report described a situation in which the F/E was communicating with the company while the captain was busy on the P.A. system, at which time the F/O misunderstood an assigned altitude while he was making the descent.

Operational Distractions

Distractions that were attributable to routine cockpit tasks or duties were very subtle and not as readily identifiable as those produced by obvious external causes. "Routine but essential" is a description that characterizes them best: running a checklist while taxiing, during the climb, or during approach; radar monitoring while changing altitudes; traffic watch at level-off; ATC communications during weather avoidance, etc. When several routine duties require concurrent attention, whether through coincidence, poor planning or urgency, the potential for a "distraction-due-to workload" event exists. Reports on such events show that they most commonly result in the "failure to monitor or ensure the desired flight path of the aircraft." Of some significance is the fact that only a few ASRS reports in this category indicated that IFR conditions were in any way pertinent. Only those reports related to the avoidance of thunderstorm activity had any reference to the external environment as a distraction factor. It seems seasonally appropriate to look at the weather-associated category first.

WEATHER AVOIDANCE — Distractions due to over-attentiveness to thunderstorm/turbulence avoidance can be classified into two sub-categories, i.e., attention outside the aircraft for the purpose of visual avoidance, and attention inside the aircraft to monitor airborne radar. Altitude awareness was most frequently affected by this type of distraction. Reports commonly contained phrases such as "we were dodging thunderstorms . . .," "we were momentarily attentive to outside weather . . .," etc., followed by descriptions of altitude overshoots.

CHECKLISTS—Twenty-two reports of checklist-associated distraction incidents were analyzed (Note: See the Table), revealing two common characteristics:

- Every report indicated that checklist accomplishment received priority over ATC requirements, and every incident ended in a potential or actual violation of ATC rules or regulations.
- The checklist activity was almost always going on concurrently with other cockpit tasks such as radar monitoring, handling minor malfunctions, operating systems, watching traffic, etc.

The checklist became involved as a distraction, not in itself but as part of a compressed cockpit workload, leading to the obvious conclusion that the timing of its completion is critical.

MALFUNCTIONS—By virtue of its ability to divert a crew's attention from keeping the airplane precisely on the desired flight path, any failure or malfunction qualifies as a distraction. Such distractions can divert the attention of the entire crew, leaving the aircraft flight path unmonitored, or by occupying the attention of one pilot it can eliminate a cross-check function, allowing some error to go unchallenged. Training establishes a disciplined pattern of response to emergency type failures or near-the-ground malfunctions, a pattern that is less evident in the handling of minor abnormalities at higher altitudes. Of the 19 ASRS reports studied in this category, all involved relatively minor situations, yet 18 of them resulted in inadequate monitoring or control of the desired flight path.

TRAFFIC WATCH—"Traffic at twelve o'clock" is identified as the most compelling distraction because it's an alarm that triggers the universal self preservation instinct. While a general traffic watch does not draw complete crew attention, a radar controller's point-out tends to draw it so completely as to produce a fixation which can negate the traffic scan in other directions. Where reports concerning traffic watch distractions most frequently discuss altitude excursions, ASRS researchers point to the consequences of inadequate traffic watch as being far more serious. Another point made (by one of the reporters) was that pilots too often responded to traffic advisories with a "roger," which can be interpreted as "traffic in sight" when in fact it is not. It was suggested that using AIM terminology would be far less ambiguous in such situations, i.e., "negative contact" or "request vectors around traffic."

ATC COMMUNICATION—In this category, ASRS reports consistently linked ATC communication distractions with other cockpit tasks in an "excessive workload" situation. Also, it appears that the timing and the content of the ATC messages (i.e., turns, amended clearances, vector headings, etc.) were more cause for concern than the messages themselves.

. . . over-attention to locating the airport or runway can detract from the accomplishment of other required tasks.

APPROACH PLATE/CHART READING—The so-called "read-as-you-fly" technique produced distractions that resulted in reports on nine altitude deviations (mostly overshoots), three near misses and a route deviation. Researchers inferred that an element of complacency may have existed which interferred with appropriate preplanning.

NEW FIRST OFFICER—An inexperienced crewmember may possibly produce distractions associated with the learning process. Reports in this category indicate, as with other distractions, that the captain's attention may be diverted from his normal duties, or that his preoccupation with routine tasks could prevent him from detecting some error resulting from a fellow crewmember's inexperience or unfamiliarity with routines, equipment or procedures.

LOOKING FOR AIRPORT—Three reports in this category established the fact that over-attention to locating the airport or runway can detract from the accomplishment of other required tasks. These reports dealt with: (1) a near miss; (2) a deviation from assigned altitude; (3) and an overshot ILS localizer with parallel ILS approaches in progress.

FATIGUE—Though not in itself a distraction, fatigue is listed here on the basis of its ability to increase crewmember vulnerability to distraction. It is noted to have been a factor contributing to six altitude deviations, two route deviations, one approach to a wrong airport and a misread chart.

MISCELLANEOUS—This is the catch-all of reports. Alluding to distractions not easily categorized due to their lack of detail or their irrelevant or incongruous nature. But distractions are distractions, all of which add up to substantiate the human susceptibility.

In the summary it is pointed out that *distraction is most critical at:*

- Ground level to 3,000 feet.
- The 10,000—11,000 feet level.
- The plus-500-feet altitudes occupied by VFR traffic skirting the edges of TCA airspace. ■

MAJOR

James E. Couture

CAPTAIN

John E. Thordsen

401st Tactical Fighter Wing

■ On 26 July 1980 Major Couture and Captain Thordsen were on a standard profile FCF flight in an F-4D aircraft. The profile proceeded normally until Captain Thordsen began a series of maneuvers emphasizing lateral controls. While in an approximately 30° right bank attitude, passing FL 130, airspeed decreasing below 300 KCAS, Captain Thordsen discovered he could not move the stick forward of a slightly aft of neutral position. Major Couture assumed control of the aircraft and confirmed the stick restriction, lit afterburners, and zoomed the aircraft. Still unable to unload, passing FL 190, with the airspeed decreasing through 120 KCAS, he ruddered the aircraft into a nose low attitude. The nose of the aircraft went through the horizon as the airspeed decreased to 100 KCAS. Major Couture found that he could maintain airspeed between 210 KCAS and 250 KCAS by using a combination of rudder, trim, and power control. It was determined that positive forward pressure was needed on the stick to prevent nose rise and airspeed bleed off. Additionally, the crew found that each time the stick was brought aft, they would lose more forward stick travel. They declared an emergency with Madrid Center, requesting an immediate vector directly to the field. The aircraft was positioned on a 20 NM final approach with approximately 2,220 lbs of fuel. Using power control, they were able to decrease airspeed to 210 KCAS, the lowest airspeed they felt would allow adequate aircraft control. For this reason, they elected to fly a high, steep, no flap approach. Major Couture was able to control his glide slope by use of throttles, maintaining 210 KCAS. Throughout the approach it was necessary to use full nose down trim and full forward stick pressure to prevent the nose from rising, bleeding off airspeed. They touched down approximately 1,000 feet down the 13,000 foot runway. As the aircraft rolled over the BAK-13 cable, the stick suddenly broke free, giving them full use of the controls again. Investigation revealed that an umbilical cord cannon plug dust cover had jammed the number 10 stabilator bellcrank. The superior airmanship by Major Couture and Captain Thordsen proved to be the deciding factor in the recovery of the aircraft and the prevention of possible injury. WELL DONE! ■

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Program.

FIRST LIEUTENANT

Raymond D. Hatchell

CAPTAIN

John C. Smith

62d Tactical Reconnaissance Squadron
Shaw Air Force Base, South Carolina

■ On 11 July 1980 Lieutenant Hatchell and Captain Smith were flying an RF-4C aircraft on a low level mission. While navigating at 500 feet AGL and 480 knots ground speed, Lieutenant Hatchell saw the shadow of a bird, felt something hit the front of the aircraft, and was struck in the left arm, shoulder and helmet, causing him to slump over in his seat. A deafening noise and violent vibrations followed the impact, making communications almost impossible and aircraft control very difficult. The force of the bird's impact moved the gear handle to the down position, lowering the gear at 480 knots. Captain Smith took control of the aircraft and started a gradual climb to reduce airspeed below 250 knots and gain altitude in case ejection became necessary. The left quarter panel was gone, the glare shield was hanging loose, and pieces of broken canopy were scattered throughout the cockpit. Bird remains were everywhere, and the center windscreen was shattered, making forward visibility virtually impossible. Lieutenant Hatchell requested a chase ship join with them to confirm damage and check his gear down and locked. As the aircraft was vectored to a straight in approach, a controllability check was performed and a precision approach requested. The indicated and true airspeed gages were destroyed by the bird. Lieutenant Hatchell used his ground speed indicator, crosschecking with Captain Smith's indicated airspeed during the approach. On turning to final, all aircraft attitude and heading systems failed and RAPCON informed Lieutenant Hatchell he would have to fly an ASR approach. An uneventful landing was made with Captain Smith reading off airspeed during the final approach. Due to damage of the rear seat ejection system, the rear canopy had to be cut and the seat saftied before Captain Smith could egress. Lieutenant Hatchell's superb flying skill and Captain Smith's outstanding crew coordination prevented loss of a valuable aircraft and further injury or loss of life. WELL DONE! ■

Summer Heat Is Hard On Feet

TAXI WITH CARE