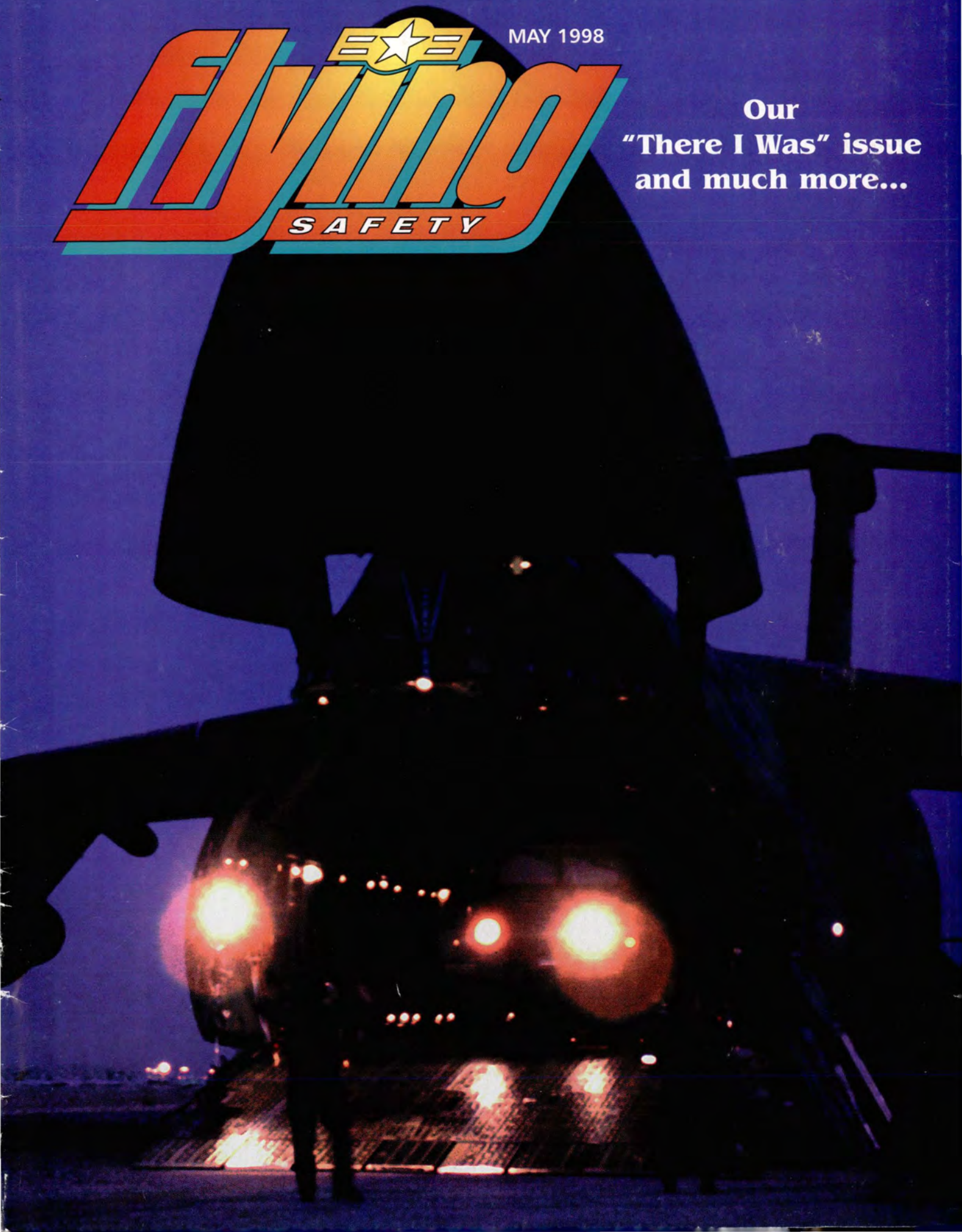
MAY 1998

Flying Safety

Our "There I Was" issue and much more...



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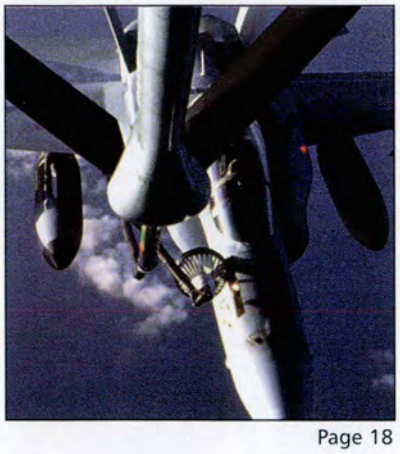

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GENERAL MICHAEL E. RYAN
Chief of Staff, USAF

MAJ GEN FRANCIS C. GIDEON, JR.
Chief of Safety, USAF

GERALD C. STRATTON
Acting Chief, Safety Education and Media Division
DSN 246-0936

PEGGY E. HODGE
Managing Editor
DSN 246-0950

CMSGT MIKE BAKER
Technical Editor
DSN 246-0972

DOROTHY SCHUL
Editorial Assistant
DSN 246-1983

DAVE RIDER
Electronic Design Director
DSN 246-0932

MSGT PERRY J. HEIMER
Photojournalist
DSN 246-0986

Web page address for the Air Force Safety Center:
http://www-afsc.saia.af.mil
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Commercial Prefix (505) 846-XXXX
E-Mail — hodgep@smtps.saia.af.mil

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FSFSFSM notams

Aircrew Fatigue Resources on the Web

MAJ DALE T. PIERCE
HQ AFRC/SES

In the past, I wrote about the fatigue countermeasures research and training programs at the NASA Ames Research Center. Recently, I was browsing the net when I discovered the NASA folks are now posting relatively short papers on aviation operations on their web site: http://olias.arc.nasa.gov/publications.html. At this site, you'll find the following:

1. Aviation Operations
   a. Procedures
   b. Training
   c. Safety
   d. Observational Studies

2. Engineering Design
   a. Prototypes
   b. Evaluations

3. Modeling
   a. Vision and Perception
   b. Cognition
   c. Systems
   d. Displays
   e. Procedures

4. Human Capabilities and Limitations
   a. Attention
   b. Memory
   c. Vision
   d. Audition
   e. Fatigue
   f. Decision Making

The fatigue area (4e above) currently has nine articles addressing the following:

1. Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation
2. Crew Factors in Flight Operations—Psychophysiological Responses to Overnight Cargo Operations
3. Circadian and Environmental Factors Affecting Sleep of Long-Haul Flightcrews
4. Managing Fatigue in Operational Settings—Physiological Considerations and Countermeasures
5. Managing Fatigue in Operational Settings—An Integrated Approach
6. Crew Fatigue Factors in the Guantanamo Bay Aviation Accident
7. NASA Airlog: An Electric Sleep/ Wake Diary
8. Crew Factors in Flight Operations—Effects of Planned Cockpit Rest on Crew Performance and Alertness in Long-Haul Operations
9. Crew Factors in Flight Operations—Psychophysiological Responses to Helicopter Operations

Since aircrew fatigue is such a significant risk factor for many Air Force organizations, reviewing this material might give you some ideas about how you might manage some of that risk. Good luck. ✈

pierced@wg53.eglin.af.mil

Split-S Fiasco

LCDR ED WHALEN
Courtesy *Approach*, Mar 98

It started out as a nice fall day in Southern California. We were scheduled for a 2.5-hour flight, but first we had to fly several simulated tactical air launched decoy (TALD) profiles. The weather was 6,000 broken with 7 miles visibility. Maintenance was kind to us, and we had a fully mission-capable jet.

Our crew consisted of a mid-tour SENSO and TACCO, a newly assigned COTAC, and me, a senior pilot. The brief, man-up, and taxi were uneventful and moved along quickly. After takeoff, we climbed toward the warning area and prepared for our TALD profiles. We were to check the launch envelopes at altitudes ranging from 22,000 to 28,000 feet. Everything was going fine, and we were collecting valuable information for our conventional-weapons officer. After the last profile, things started going wrong.

I had briefed that after the last profile we would slow to 180 KIAS and do a split-S to reduce our altitude. This would have been a perfectly acceptable plan—if I had flown what we briefed. After the last profile, I raised the nose of the aircraft to reduce the airspeed from about 340 KIAS to 180 KIAS. At this point, I'm not sure what happened. I think I looked at the airspeed indicator and saw 180 KIAS when it actually read 280 KIAS. I began the split-S at 23,000 feet, and after rolling the aircraft on its back and pulling for the ground, I realized that something was wrong. The nose of the aircraft was pointed almost straight down. The throttles were at idle, airspeed was building, and the nose had stopped tracking back toward the horizon.

The nose of the aircraft was pointed almost straight down. The throttles were at idle, airspeed was building...

The control stick had become useless, and I released it. I deployed the boards and started running the pitch trim to full nose-up. The cloud deck was at 8,000 feet and was quickly closing. I thought we would have to eject and be seriously injured, if not killed, because of our speed.

Throughout this entire sequence, no one in the crew said a word.

The nose finally started coming back, and we bottomed out at 8,000 feet, skimming the top of the cloud deck. After we all took a deep breath, we continued the hop and landed without further incident. An inspection determined we had not overstressed the aircraft.

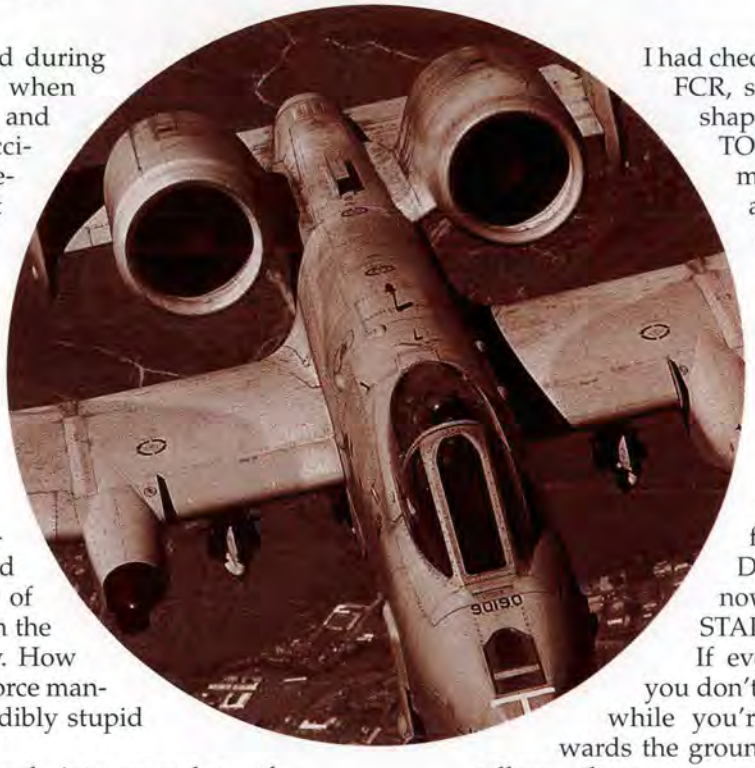
I learned several things in the debrief. Both NFOs knew we were at 280 knots but didn't say anything because they thought I knew what I was doing. The COTAC did not realize how dangerous a situation we were in. Last, I discovered I had not been talking to the rest of the crew.

Our crew coordination had failed. Each crewmember must work with the others. No one should be left in the dark or be afraid to voice his opinions. If someone had spoken up, we would never have gotten ourselves into such a predicament.

Finally, I learned you have to check and recheck everything. I misread the airspeed, and although my brain knew something was wrong, I pressed on. If I had taken that extra moment to recheck the airspeed, I am certain I would have caught my mistake. ✈

About the Bold Face and Other Things

Reprinted from *Flying Safety*, Jul 85



USAF Photo by SSgt Andrew N. Dunaway, II

Have you ever noticed during safety meetings, when someone stands up and briefs the latest accident or incident report, the typical cry that resounds through the masses is "You gotta be kidding me," or words to that effect? Inevitably, there's a story of someone who had done his ever-loving best to eliminate himself or a perfectly good airplane. He forgot something, did something inventive, or launched himself into some regime of flight heretofore untried in the annals of aviation history. How could a professional Air Force manage to hire so many incredibly stupid people?

Well, next time you reach into your bag of stones to drive one of your aviation fraternity brothers into exile, make sure you save a rock or two for yourself. No, I'm not writing to encourage self-abuse or to lecture on the inevitability that all of us will screw up. This is to point out that even the many-houred jocks can secure a place among the infamous and to reassure a few A-10 experts that Uncle Fairchild has adequately provided for you.

This is where we do the "There I Was" part, but you may want to stick with me—it's a beauty! On the third FCF of an A-10 with continuous APU problems, I decided to try an APU-assisted air start of the No. 2 engine at 15,000 feet to check out the airflow output on a new APU. In accordance with Dash Six procedures, I fired up the APU, cooled the right engine, and shut it off. After the engine had then cooled to below 150 degrees, I was ready to go for the start process: Pull No. 1 to idle, lift No. 2 over the detent to idle for start. Oops!

Whadda ya mean, oops? You know, it may sound strange, but as soon as I whipped that good engine from MAX to OFF, I knew I was in trouble. The sequence of events went into slow motion. My first reaction was to throw the throttle back up, say I'm sorry, and start all over. Sanity prevailed, however, and I realized I would be looking at a pretty bad overtemp on that engine if I did.

"Bold Face," said the little man in the back of my head. Sure. What have you got to lose? You're not going home on the APU. THROTTLES—OFF: That's easy. We're already there. APU—START: Easier still. It's already going. FLIGHT CONTROLS—MAN REVERSION: Simple. I had checked that twice on the first FCR, so I knew I was in good shape. LEFT ENGINE—MOTOR: No, thank you very much. I'm at 13,000 feet, and the terrain is 8,000 feet. Let the guys at Edwards practice low altitude, dead airplane tests. I need an engine now! Just prior to the big blunder, the right engine had already been cooled. That seemed a better choice for an easy start. Crossfeed was already on as a Dash Six precaution, so now it's RIGHT ENGINE—START.

If ever there's a place where you don't want to FCF an APU, it's while you're gliding helplessly towards the ground. As any FCF puke will tell you, there are two characteristics of the APU-assisted start at 15,000 feet: (1) the No. 2 engine has a tendency to produce warm or hot starts, and (2) the core rpm will periodically hang up at 56 percent. My right engine had cooled sufficiently to preclude the former, but it did opt for the latter. Help!

We'll note here that in the Dash Six a "Note" states that if the right engine fails to start at 15,000 feet, descend to 10,000 feet and reattempt. So, the key word is patience. Don't panic! Sure enough, at around 11,000 feet the rpm started to creep up to idle. I was out of the woods, literally, by a whole 3,000 feet.

So why do I bare my soul to the world for being such a bozo? Call it conscience or maybe just a desire to save some other poor fool from the same stupid mistake. Regardless, there are some lessons to be learned:

❑ Think before you do!

❑ A lot of flying time is worth something only if you apply Lesson 1.

❑ Do the Bold Face. Also, think as you do the steps. There may be commonsense items to do along with the bold face. For example: Use whatever residual hydraulic pressure you have left as the engines unwind to establish a 1-G level glide as you're performing Steps 1 and 2 of the dual engine loss procedures.

❑ After you've done it all, think again to make sure you did it right.

If you've never done an FCF, go find someone who has and talk about it. Strange things happen to Warthogs when you shut off motors and other nice-to-have items. It may be worth your while to hear a few war stories. ✈

An ORM Tale: Three Came Back

LCDR TREY TURNER
Courtesy *Approach*, Jan 98

The work-up cycle continued and the next at-sea period was days away. The squadron had to produce 13 fully mission-capable aircraft. All the maintenance personnel were working 12 hours on and 12 hours off through the weekend.

The biggest obstacle was bad weather. The functional-check flights were stacking up. It was winter in Virginia Beach, when weather patterns are unpredictable at best. When a system does move through, you can usually count on overcast conditions with occasional low ceilings. The pressure to fly the check flights was intensifying.

OPNAV 3710.7Q gives a commanding officer some latitude in determining if check flights should be flown:

Functional-check flights should be conducted during daylight hours within the local flying area in VMC and under VFR. If necessary, to accomplish the assigned mission, unit commanders may authorize check flights under conditions other than the above if, in their opinion, the flight can be conducted with an acceptable margin of safety under the existing conditions.

By now, the ship was under way with the majority of our tools, parts, and maintenance personnel. Only a small cadre of skilled, hard-working maintenance people had been left behind. The first available aircraft had already flown aboard to begin CQ (carrier qualifications), and additional overhead times were expected the following day.

The check-flight crews were in early that morning, standing by to man up at the first sign of a break in the weather. These crews consisted of the CO, XO, and four of the five department heads for three FCFs.

For the second day in a row, the base meteorological office was reporting 700-foot overcast conditions. Having less than optimal FCF weather, the crews busied themselves with the personal and administrative details.

As the day progressed, the crews watched the weather, constantly looking out windows and calling metro.

The skipper was the first to notice the large patches of blue sky peering through the clouds and quickly handed out the latest weather forecast—improving conditions. All the crews dropped what they were doing and hustled into their flight gear. As they walked outside to man up, the large patches of blue had gotten a little smaller. Sunset was also right around the corner.

On one hand, we had the operational requirement to complete the FCFs and get the jets out to the ship. On the other hand, we had marginal weather that could be getting worse, and the sun was sinking on the horizon. This is where we should have started applying operational risk management.

When does the little voice in the back of your head become loud enough for you to hear it? In this situation, with the vast amount of experience in each cockpit, the voices should have been yelling.

They weren't.

All three aircraft launched, and while airborne the field went IFR. The little voices were finally heard, and the crews recognized the risks. The F-14s returned to the field on instrument approaches.

The pressure of operations, or any kind of pressure, either perceived or real, can cloud your judgment. The key is to manage the risk and reduce it to a workable level. Ideally, when the risk becomes too great, a reasonable person will recognize this fact, discontinue the task, and apply this data to the next scenario.

In most cases, aircrew debriefs after an FCF are rare. However, these crews had a lengthy discussion. Afterward, a definitive policy was established that would affect the go/no-go criteria for future FCFs in this squadron. Below are a few of these new SOPs.

1. For "A" or "B" profiles*, the aircraft must be airborne 1 hour before official sunset.

2. In no case will an FCF land later than 15 minutes after official sunset.

3. "A" and "B" profiles must be done in VMC or clear of clouds, with forecast ceiling and visibility of at least 3,000 feet and 5 miles.

4. "C" profiles must have forecast weather that will allow for a VFR departure and arrival (1,500 and 3 at NAS Oceana) and be conducted clear of clouds.

5. The aircrew will not launch if they cannot be reasonably sure of completing the profile given the weather and time constraints described above. ✈

*FCF profiles are a different type depending on maintenance action taken.

Lessons Learned—A Fictional Account...Sorta

USAF Photo by Mr Walt Weible

MAJOR DAVID L. SEARCEY
71 FTW/DOOT
Vance AFB, Oklahoma
Reprinted from *Flying Safety*, Apr 89

Once upon a time there was a 2d lieutenant IP in T-37s. It was a cold day (20 degrees Fahrenheit), and the lieutenant was cold and bored watching his student do a preflight inspection. (How can he be so slow?) The young IP leans on the wingtip of the Tweet with arms folded. In his boredom, he decides to bounce on the wing to ensure that the main gear strut is fully compressed. CRACK...

The T-37 wingtip is made of fiberglass. The young IP now has a problem under his arms (a cracked wingtip) and a bigger problem on his hands (what will he do?). At this point, our 2d lieutenant has three options.

- He can write up the aircraft, explaining how HE just broke the airplane.
- He can write up the aircraft, claiming to have found the broken wingtip on the preflight inspection.
- He can say nothing, fly the plane, and hope the problem goes away by the time he lands.

Only a fool would fly a plane with a broken wing, and fools are a dime a dozen. This lieutenant actually flew the mission and even forgot to write up the plane after landing!

About an hour later, the lieutenant's crusty old section commander came in, grabbed him by the ear, and led him into a closed room. He quietly pointed out the stupidity of a certain young IP ("You could have killed yourself, your student, and others on the ground!") and told him, "If you make a mistake, own up to it. It's easier to live with the punishment than to die without the blame."

There are several lessons in this story. First, a dead career is always better than a dead body.

Second, an IP is responsible for more than his own neck. Our lieutenant learned these two lessons well.

Third, supervisors do have to enforce standards, but there are times when the potential of the sinner is worthy of a little mercy. That old commander saw some potential in the young IP. He could have had that IP's wings—but he didn't. He kicked him out the door, told him NEVER to do such a thing again, and never told another soul.

And that's why I love that old commander. ✈

There I Was...

A Basic War Story

COL STEPHEN R. CONNELLY
HQ Air Force Special Operations Command
Director of Operations
Courtesy *AFSOC Commando Safety Journal*,
Spring 1998

It was a dark and stormy night...1972, Da Nang Air Base, Republic of Viet Nam. The Air Force had lost an F-4 north of Haiphong Harbor in the Chinese buffer zone. This was going to be a nasty mission. The coastline was saturated with AAA, 8-10 miles inland it's solid bad. Maps are covered with grease pencil circles designating overlapping coverage of these formidable defenses. Big stuff: 37, 57, 85mm and tons of radar. The mission's chance of success was not very good. It would have to be done at night.

The call went to the night recovery system (NRS) crews of the 40 ARRS at Nakhon Phanom AB (NKP) in Thailand. Hard crews had trained in this specially modified H-53. A hover coupler system was used to stabilize the helicopter in an inky-dark hover, while a low light level TV (LLLTV) allowed crews to search in near blackout. The APN-175 doppler provided navigation cues to the crew. The coupler, LLLTV, and doppler were all somewhat notorious for their inabilities to actually do what they were supposed to do. We were asked for some volunteer crews. My aircraft commander (AC) volunteered us to cover for the "low bird." It was going to be a fun night.

We deployed to Da Nang, got a little rest, and worked a comm-out takeoff with Da Nang tower. We used the light gun signals I had seen only on the laminated placard on the dash of the alert six pax vehicle. It was real cool. We had never done this before.

We took off in formation almost direct north, and as we went over the water, about 2,000 feet past the overrun and 300 AGL, we flew into the ink pit—also into a fog bank we didn't see. Our first no-notice night formation low-level inadvertent IMC. (My first inadvertent IMC, period.) We had already logged 0.1 hours. At 0.2 hours, we had to break radio silence to ask lead to go "Christmas Tree"; it was a "secret" code word we worked out to let lead know the 175 doppler and LLLTV were working marginally, as expected. (We caught lead at the first aerial refueling (AR), but that join-up is a whole other story.)

We climbed out, seeing nothing (to include lead), and leveled at 2,000 feet. There was nothing out there. The ONLY hazard was the water—and maybe lead if he doesn't have lights on—and the doppler is working right.

We felt safe from a midair collision (foolishly, but that's another story too).

There seemed to be an awful lot of ground lights, so the AC insisted I give him a vector out over the water as he was convinced we were somewhere in North Viet Nam or the DMZ (at about 0.4 hours logged). Apparently he didn't trust the J-4 compass though, and we had been going straight north, which was right into the heart of the Gulf of Tonkin and straight toward the AR track and our coast-in point nestled right up against Red China.

The AC was "pretty insistent" we were over North Viet Nam, so I told him to turn east (toward Acapulco) and explained how hard it would be to find lead on this "new" heading. I had hacked the clock (time, turn, tune, talk), and after 2 minutes we started a turn back to intercept our original course (according to the doppler), pretty convinced that lead would definitely be in front of us.

The ONLY hazard was the water…

We pushed airspeed as much as we could to overtake lead and meet the tanker. That's "as much" as vibrations would allow. We computed we would meet both of them at the same time and same place. There would be spotlights on. If we were anywhere in the vicinity we'd find them. We settled into a routine of staring out the ink window, looking for lead, and seeing our faces looking back.

We didn't use NVGs in the cockpit back in those days. We didn't know they were blue light insensitive, red light sensitive, and we used red light cockpits back then. It was obviously impossible (to us) to use both NVGs and instruments in the cockpit. However, since the only task at hand was to look for lead, I mooched some spare NVGs from the PJ gunner/scanners and started ground school about 40 NM north of Da Nang. By 50 miles, I had killed my instrument lights and was becoming quite a good scanner, although my copilot duties had been deleted. Since there was nothing going on in the windshield, and no hazards out there except the water, we trimmed up at 2,000 feet and got focused on the inky windows and the NVG copilot training.

At 200 fpm, we were 10 minutes from the water. NVG training for the copilot took more than 10 minutes. During this time, the flight engineer in the right door noted that the waves were getting "farther apart." An interesting intercom call, in retrospect. We were using primitive NVGs (pre PVS-5A for you antiquities buffs, made of stone and wood), depth perception was about as good as the doppler—not too.

No one thought to check altitude. The waves continued to get farther apart. Undetected by us, we were descending from our 2,000 foot cruise. I had turned pure scanner with my goggles against the windscreen and forearms and flight suit shielding me from every scrap of light and information in the cockpit.

A bright light wiped out the goggles and brought my head back into the cockpit to kill this new distraction. It was the radar altimeter low light.

In flight school, they taught us to use the radar altitude low light to identify the syllabus-standard 10-foot wheel height hover. We set it at 15 feet to allow for the nose-up attitude and placement of the system's antenna. It also worked with the hover coupler and gave an unpleasant noise if you set it too high and descended below the set height. I can't remember anyone ever telling me it would protect you from killing yourself through stupidity, complacency, inattention, crew breakdown, lack of risk management, distraction, or a combination of these known killers.

That distracting light had been on for many long seconds when I finally read the gauge. It was **below 10 feet**—and accompanied by a yaw and whining of engines. We noted that we would need to write up the aircraft for exposure to salt water. My aircraft commander had saved our lives. I was still hunched forward with forearms and goggles on the glare panel as the nose of the aircraft went from nearly wet to skyward once again.

One of the early PAVE LOW guys seemed sorta excited about the potential uses of the radar altimeter. We teach the use of the radar altimeter low light differently now. The ONLY hazard out there was the water.

It's always the **basics that save you** and the **failed basics that will try to kill you.** For all the weaknesses of the night recovery system's doppler, coupler, and LLLTV, we never had an accident using it in the darkness. A failed coupler was easy to recognize, even at night. Failed basics are usually much harder to detect. More likely than an NRS accident at night was the daytime accident at the aux field, usually with experienced crews, or crews like mine—well-oiled, hard crews with unquestioned trust in each other, yet sometimes blind to a breakdown in the honed habits and skills that comprise the basics of aviation safety.

Copilot playing with NVGs, the waves getting farther apart. The ONLY hazard was the water… ✈

Story and photo courtesy *AFSOC Commando Safety Journal*

Not Just a Wrench Turner

Sgt Sean Powell
MAG-42, NAS Atlanta

MAJ PEYTON DeHART
MAG 42, NAS Atlanta
Courtesy *Mech*, Oct-Dec 97

Sometimes it's almost frightening how casually mechanics save pilots' lives. One unremarkable day, a particularly stubborn AH-1W Super Cobra was defying the best efforts of Sgt Sean Powell, who was trying to get the main rotor to track and balance for a smooth ride. Sometimes, he thought he had it fixed. One last adjustment ought to have made it perfect, but the Vibrex (balancer box) told us we were still out of limits.

A dazzling sunset graced the flightline of NAS Atlanta; we'd run out of daylight and could no longer fly. The sergeant and I had put in a full day; the following one would see us complete the task. While not a rock-solid guarantee, our maintenance department tries to let the same crew test a helicopter through to completion. So it was that the next day I walked out to preflight, and again, Sgt Powell was there, ready to turn wrenches.

Climbing around, bending under, and sticking my head between components, I looked over the bird with an eye for what might be out of place, disconnected, or broken. The left side and the right side looked good so far.

Back on the tail boom, you expose the tail rotor drive shafts by rolling the 12-foot, U-shaped cover upside down on its long hinge. The top part of the cover dangled over the right side of the tail boom, and I ran my hand over the length of each hollow tube that formed the drive shaft. There were no dents, nicks, or scratches that could cause a shearing stress.

That tube is spun of aluminum about an eighth of an inch thick and transmits power to counteract main-rotor torque (that torque fed by engines cranking out more than 3,000 hp)—a flaw that could set up a shearing stress. If the tail rotor drive shaft sheared while airborne, the helo would go into an uncontrollable spin. Chances of landing upright in that condition are slim at best, but this one was fine, so we could close it up and go flying.

Sgt Powell was on the right side of the tail boom and pushed the cover over the top of the drive shaft. The fastener side arced over the top and slammed home on the left side of the boom—and that's when the hair on the back of my neck stood up. There are nine fastener screws that hold the cover in place. One of them was gone. If it had been missing the day before, I would have known about it because I preflighted and flew this aircraft the day before. It was there then.

I looked to see if the fastener had fallen to the deck. Nothing. I lifted the cover and looked at the metal floor under the drive shaft. Nothing. Sgt Powell walked over to where I was standing. He swept his hand behind the drive shaft. Nothing. The hair on the back of my neck lay down. By the book, we had done a search for the missing object. I was satisfied that we had a clean bill of health. We had checked the area and the fastener wasn't there.

We could get another one from supply, bolt it on, and continue with the test flight. But Sgt Powell walked over to the other side of the Cobra, reached over the cover, felt around blindly behind the drive shaft one more time, and found the missing fastener. It had been there all the while, hidden from sight and from our efforts to find it from the other side. Had I taken off, the screw would have rolled under the drive shaft, lathed it for a minute, and then the thin tube would have ripped apart. I probably would have spun the helicopter into the trees in a local neighborhood.

Sgt Powell walked back to the left side of the helo and started to lock down all the latches. Making conversation, he said, "Oh, I wasn't going to launch this Cobra until I knew where that fastener was."

What made him search the same place he had just searched? All for the sake of one small screw? Professionalism. Plain and simple. ✈

There I Was...

Get the Kill

Reprinted from *Flying Safety,* Nov 84

At the time, I was a very junior pilot in a Persian Gulf squadron, and life was idyllic—tons of exhilarating flying, no rules to speak of, and unlimited supplies of ice-cold Carlsberg.

The weather was brilliant and calm as usual, with a hazy horizon at low level over the sea. Flying as No. 4 on a four-ship bounce HI-LO-HI Strike, I was desperately keen to mix it with the bounce—a flight commander with whom I was not on the best of terms. I fancied myself a bit of a tiger at combat and once again felt that tremendous surge of adrenaline as I picked up the bogie—a mere speck in the deep blue vertically above us—as we passed 20,000 feet in the descent over the sea.

In spite of my early pickup, the attacker was soon in the middle of our twisting and turning formation. Determined to keep contact with my hated adversary, I committed the cardinal sin of losing my element leader within seconds of the start of the fight. (This, next to refusing to fly with a hangover, was considered to be the ultimate sin at the time.) Desperate to retain some kudos, I threw myself at the bounce while screaming on the radio that I would soon be claiming him. On hearing this, the rest of the formation promptly departed at Warp 9 speed for the IP, abandoning me to my well-deserved fate.

My personal duel with the bounce dragged on for a minute or two, and it became uncomfortably apparent that I was getting nowhere near to achieving a kill. Unbeknown to me, the bounce was setting me up for a runout and, having skillfully maneuvered me away from the last known position of my companions, he suddenly disengaged in hot pursuit of my erstwhile formation.

Incensed at the way I had been duped, I dived frantically for airspeed, simultaneously skylining the bounce as a dwindling speck just above the horizon. Throughout the whole of the engagement so far, I had paid only cursory attention to our height and fondly imagined that at this stage I was still at least 10,000 feet above the sea. My whole attention was riveted on the speck on the horizon as my aircraft began to hum with the famous "blue note" at high indicated airspeed. Should I lose "tally" then, I knew I would never pick him up again.

After a minute or two, the horizon in my peripheral vision slowly began to change color. Through the thunder of the 600-knot airflow, I dimly became aware of a tiny voice in my brain repeating the same message over and over again. In a flash I woke to the awful reality—*check your height!*

I was in a shallow dive with the altimeter slowly passing 200 feet. The sea was like glass and could have been 200 or 2,000 feet away from me. I pulled up violently to get away from the water that had so nearly killed me. Furious at my stupidity, I flew slowly home to receive a well-deserved bawling out for failing to stick in formation. I was too ashamed to tell of my near-disaster.

The lesson for me was simple. Never let personal animosity cloud your judgment in combat. The stakes are too high, even in peacetime. ✈

Adapted from *Air Clues*

The Receiving End

E. JEFF JUSTIS, JR.
Col, USAFR (MC) (FS)
Reprinted from *Flying Safety*, Apr 88

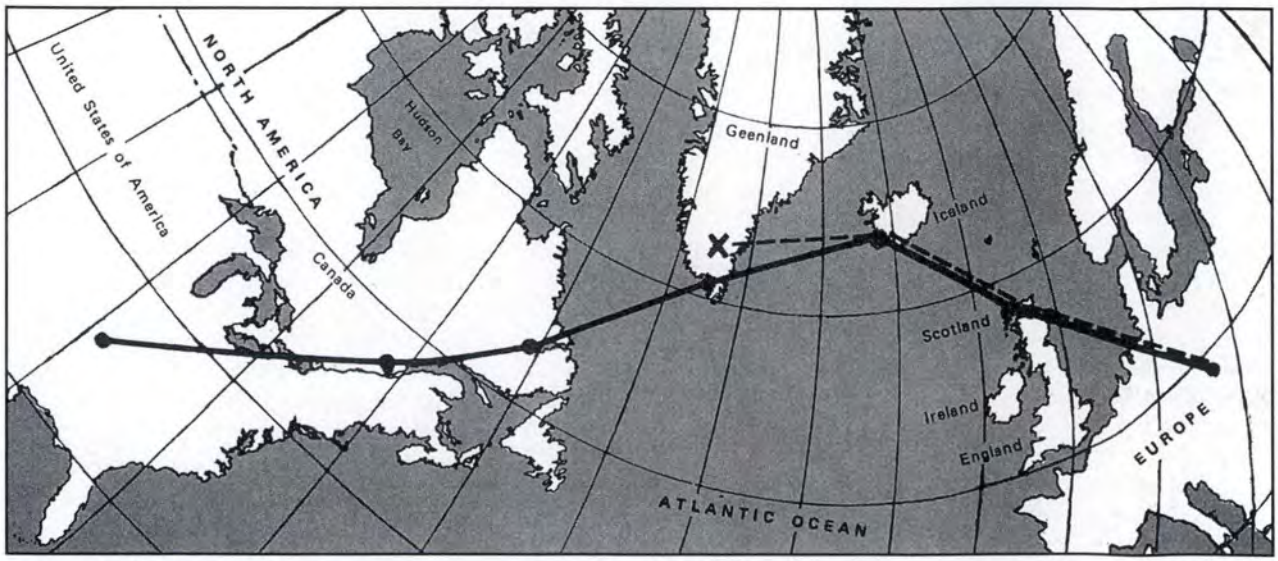
There are many axioms that apply to instrument flying. Two of the most important are:

1. Never begin a descent unless you know your exact position, relative not only to "nav" aids, but also to terrain.
2. Always know that your target altitude is a safe one.

Many approach mishaps we read about are probably related to noncompliance with these commonsense rules. Unfortunately, a crew involved in a collision with the ground isn't usually available to explain or help others understand why it occurred. Fortunately, I *have* survived such a mishap, and can tell how I found myself on the receiving end of a search and rescue.

It was a gray, dismal morning in Iceland, and my wife and I anticipated an uneventful flight to Narssarssuaq, Greenland. It was to be a 4-hour trip in our Twin Comanche, which has a 6½-hour

In spite of simple navigational equipment, the flight to Europe had been completed with no problems. However, the return trip 3 weeks later was another matter. A series of unexpected events resulted in a deviation from course and an unscheduled stop on the Greenland ice cap.



The pilot's first indication of trouble was a terrible vibration from the left engine. As the propeller came to a stop and folded back toward the nacelle, he thought he had hit another aircraft.

The view of the west coast of Greenland with the icecap in the background was taken on the way to Europe. It's spectacular scenery but not an inviting place for an en route stopover.

range. We weren't blessed with sophisticated navigational systems such as INS or Omega, and I had no nav sitting behind me to run celestials or keep me straight, so nondirectional beacons (NDB) on Iceland and Greenland were to be our primary means of navigation.

I did have an inexpensive Loran-C on board, but it had been useless for the flights from Canada to Greenland and Greenland to Iceland 3 weeks earlier. I also had a high frequency transceiver, but it was ineffective for communication.

In a word, we were flying primitively, much as our World War II flight crews had done. You may recall that a flight of P-38 Lightnings crashed somewhere on the island of Greenland en route from Canada to Europe in the forties. But I had flown to Europe once before in a light airplane even less-well equipped than the Twin Comanche we were currently flying, so the confidence of past success spurred us on.

Unknown to me, events were conspiring against us. A low pressure system off the southern tip of Greenland was kicking up stronger southerly winds than forecast. This same low was also blowing warm, moist air over the massive Greenland ice cap, and it was condensing into a thick ground-hugging stratus. And, though quite powerful and capable of being received all the way from Canada on an eastbound flight, the NDBs at Narssarssuaq and Simultac (on the west coast of Greenland) were weakened by atmospheric conditions. Reception was nearly impossible for a westbound flight like ours, and I was trying to navigate by two inaccurate NDBs north and south of my proposed track.

After 3 hours of flying, the coast of Greenland became visible, rising out of the blue waters of the North Atlantic. We were cruising at 9,000 feet but soon had to climb to 12,000 feet to cross (what I assumed was) the southern tip of Greenland. No landmarks were distinguishable and we entered a thick bank of clouds. For the next 45 minutes, we were in IMC with no lateral track guidance.

I periodically changed frequencies on my single ADF, trying to receive one of the strong NDBs on the east coast (without success) but always returned to the NDBs on the west coast. Suddenly, I was unable to receive even the west coast NDBs. For whatever reason—failure of the preamplifier in the belly-mounted antenna or precipitation static—I had lost my only navigational aid.

Based on flying time and distance (and assuming I was on track), I should have been nearing, if not flying over, the west coast of Greenland. But a fear of flying past the west coast of Greenland and over the North Atlantic again with insufficient fuel prompted me to take a decisive action: I was going to descend.

I attempted to determine a safe altitude by looking at the ONC I was carrying but realized many of the Greenland altitudes were approximates only since the ice cap is constantly changing. The decision to descend was based more on a hoped-for position than an actual position.

I had lost all communications and navigational aids, and the die was cast. I had run out of options. (Since then, of course, I have thought and rethought many other decisions I could have made.) I slowly retarded the throttles to begin a gradual descent to 9,000 feet, the initial approach altitude in the Narssarssuaq area, and one which I thought would bring us beneath the overcast.

At about 9,300 feet and still in IMC, I began to round out my descent, bringing in a little power. Suddenly, I felt a terrible vibration coming from the left engine. I looked out to see the engine shaking wildly and the prop jerking.

My first thought was of catastrophic engine failure. Then, just as suddenly, the left prop stopped

continued on next page

With nothing but ice and snow in sight, the arrival of the rescue helicopter was especially comforting to the stranded travelers.

turning and folded back against the nacelle. Now, I *knew* I had hit something, but thought it was another aircraft. Then, a sudden jerking deceleration threw me back and forth against the glare shield, and there was silence, except for the blowing snow and sleet clicking against the windscreen.

Outside visibility beyond my wingtips was nonexistent. If not for the silence and the lack of motion, I would have thought we were still airborne. But the snow piled up underneath the left nacelle told me we had crashed in the middle of the largest glacial ice cap in the world outside of Antarctica. As this realization struck home, I immediately became concerned for my wife sitting behind me. Amazingly, we had survived the crash (in an intact airplane) with only minor injuries.

The aircraft's electrical system was inoperative, but with a hand-held transceiver, I was able to get a relay from a passing jet and tell our plight to Gander Center. Within 3 hours the weather began to clear a little, and I heard the drone of a C-130. It was part of a USAF Search and Rescue (SAR) Squadron based at Woodbridge, England, on a 2-week deployment to Iceland.

My emergency locator transmitter had provided our position for the C-130, and I was able to communicate with the C-130 aircrew through my hand-held transceiver.

Directed by the C-130, a Sikorsky H-61 helicopter operated by the Danish government rescued us from the barren wastes of the Greenland ice cap an hour later. As we were lifted past the Twin Comanche and back to civilization, I realized how grateful I was to the men and women of the USAF SAR teams and to the people who man the satellite coordination centers throughout the world. Someday, I hope to meet the great crew of that C-130 aircraft and thank them in person.

Believe me, I'll never make an instrument approach again without confirming my position two or three times *and* checking my target altitude against altitude of any terrain in the area. Hopefully, my experience will provide some food for thought next time you make an approach or begin a descent and prevent you from being on the receiving end of a search and rescue! ✈

With rescue a reality, the author's wife, Sally, could begin to relax once aboard the helicopter with the Danish rescue crew.

The author and his wife a day or two after their amazing survival show little adverse effects except for a swollen nose and lip.

A "THERE I WAS" FROM THE PAST

No Sweat!

For any helicopter pilot, power is the important key to flight. If you have enough, you can take off and fly. If you haven't, you can't. It's as simple as that. So the day I found myself looking at a rapidly approaching fence with the low rotor RPM warning in my ears, it was pretty obvious I hadn't given it enough importance. Like they say in the classics, "There I Was", and it was my own fault.

It was on the last day of a month-long deployment, and we were on a single aircraft 2-day transit home, across the top of Australia. We had to land to refuel at an outback homestead where the drums of fuel and a rig had been prepositioned. From the trip up, we knew that the rig had been left beside a radio tower, about a mile into the forest from the runway (a couple of thousand feet of red bull dust). Because of our weight and density altitude conditions (heavy, 2,000 feet and 40°C), the power check became all the more important, so it was carried out before landing.

After landing at the strip to unload excess weight, we flew over to the fuel rig beside the tower. After shutting down, I checked the performance charts once again while the rig was being loaded, and I established that we had just enough power to take off from an in-ground-effect (IGE) hover. Unluckily, the only clearing large enough was a quarter of a mile away, but I could see a path between the trees that we could hover along. The wind was light and variable, tending to a tailwind, and though the ground was heavily rutted, I didn't think it would significantly destroy the ground cushion. So, we started up and set off.

That's where it all started to go wrong.

I lifted the Huey to the hover and checked my power. It was as predicted, so I continued. I turned towards the clearing and started moving forward at what seemed to be a comfortable pace.

Then I saw the wire fence, but it was too late to stop. I raised the collective to climb over it, but the rotor RPM bled and the beeper came on.

Yes, folks, there I was. Maximum power, looking at a fence, and not getting any higher. We couldn't stop, so I had to go against everything I had been taught and overpitch and cyclic-climb as a last-ditch effort to get over.

Thankfully, it worked.

As we got to the other side, I cushioned on and landed, with half a ton of adrenaline now running through me. I had pulled it off, but it was my own fault that I'd got into the predicament in the first place.

I turned into wind and did a power check in the hover, getting to about 8 feet before the engine RPM bled. We did a good training-type takeoff (abort point, hover point, etc.) from the clearing and flew over to the drums, refueled, and went home.

What Caused This Situation?

Looking back now I can see the warnings, but clearly I didn't pay enough attention—rough ground, light tailwinds, a little bit heavy, hot and high (density altitude was 5,200 feet). Individually, they could be accepted, but they added up to a potential accident. I had taxied too fast for the tailwind, didn't look far enough ahead, and took the charts as gospel without allowing for the particular situation I was in.

This incident involved an Iroquois, but the lessons learned can be related to any aircraft type. By not paying enough attention to the small details, a potentially hazardous situation can occur when they all come together.

The key word here is airmanship. I was lucky, but I learned a hell of a lot from it!

Will you? ✈

Courtesy *Flying Safety Spotlight* 4/96

Sink Rate, Sink

MAJ BALDWIN J. DE BOER
Chief, Flight Safety
Tactical Helicopter Group
Royal Netherlands Air Force

There hasn't been a new kind of accident in a long time. It's the old accidents that happen again with new (and slightly less new) people....

Rate, Sink Rate!!

We had completed our Aircraft Qualification Course at Fort Rucker, Alabama and now were halfway through the Unit Training with the 21st Cavalry at Fort Hood, Texas in the AH-64 Apache. We worked our way up from single and two-ship missions to participation in larger flight and squadron-level missions. Part of the training included live firing the Apache's 30-mm cannon and 2.75-inch rockets.

This mission was a night one, and we were to engage targets, alternating with the gun and rockets, both from hover and "running fire" scenarios.

Most engagements were to be conducted by the frontseater (the copilot/gunner, or CPG), but there was also to be a "pilots IHADSS (Integrated Helmet And Data Subsystem) engagement." In this case, the backseater (the pilot—that's me) was to engage a stationary target with the 30-mm gun. As sight, he uses the helmet mounted unit, which provides the night vision image, plus the flight symbology. (This is also known as the HMD, or helmet mounted display.)

First engagements by the CPG were to our satisfaction (all direct hits, ha ha ha!). After we had informed the tower "Switches cold," we got permission to relocate our "sixty-four" to the battle position for the pilot IHADSS shot.

I selected a spot above some low trees (for reference), with free fly-out zones to the front and the sides. Per our crew brief, I took a height of 60 feet. Not very low, but since this was our first time, certainly not too close for comfort. Just a good height to begin with...

We went through our checks, verified being "happy," and called the tower with "Ready and set." We received final instructions, followed by "Cleared hot."

I selected the gun and waited for a target to appear. Since I had a pretty good idea where that would happen, I was ready when the plywood "Truck" popped up. I said: "Target visual, engaging with gun—three, two, one," to my CPG and pulled the trigger. Suddenly the world was gone! All I could see in my HMD was snow and stripes, just like if you disconnected the cable from your TV. But this was no common TV—it was my total night vision I had just lost, symbology and all.

There I was...low over some trees and suddenly blind. As if that weren't enough, I heard the voice of my frontseater on intercom, calling out with growing concern: "Sink Rate, Sink Rate, Sink Rate!" I still couldn't see, so I started to pull power with the collective. In the background of my CPG's voice, I heard rounds still leaving the gun below us.

Then a light came on in my mind. I released the trigger and *voila!* Night vision was back! But during the last split second, the world had changed dramatically and I saw an awful lot of trees! Luckily for us, they filled only the bottom half of the HMD, so we weren't yet BETWEEN them. While pulling more collective, I noticed a height of 35 feet on the radar altimeter. My CPG later confirmed that....

Lessons Learned

- Our near disaster had started with an equipment failure. Of course, it's highly unusual for the night vision system to quit when you operate your weapons, so, not in my wildest imagination could I have foreseen this emergency. It happened so quickly that we had no time to carry out emergency procedures for an IHADSS failure.
- Our "high" hover height of 60 feet gave us time to react. Don't go lower than necessary, and disregard remarks from the tower, like "This is Houston Control. You are cleared for reentry."
- My frontseater (the best around) was not sleeping. No sir! He monitored my work, and with his "Sink Rate, Sink Rate, Sink Rate!" supplied me with information I couldn't get anywhere else. I had no vision system, but at the time, he *did not know* this—he was the crucial factor in my situational awareness. Here we see the importance of crew coordination! Don't just come along for the ride—stay active! Monitor your crewmember's performance and give advice when you feel the need.
- The two of us have spent some 10,000 hours in the "offices" of military aircraft (equally divided) but that didn't prevent this near-disaster. Spatial disorientation—whatever the cause—can happen to ANYONE, in any type of aircraft, in any kind of situation. It doesn't have to start with a technical problem!

Put your experience on paper and send it in so we all can learn from it! Contribute anonymously if you'd like, but keep the dialogue going. That's more important than ever since crew rooms are empty and everybody has so much to do. We have to communicate!

There hasn't been a new kind of accident in a long time. It's the old accidents that happen again with new (and slightly less new) people....✈

NOTE: This article was first published in the February 1998 issue *Veilig Vliegen*, the Royal Netherlands Air Force Flight Safety magazine.

I Could Have Told You the Color of the Pilot's Eyes..!

Official USAF Photo

CAPT MATTHEW W. HARPER
38th Reconnaissance Squadron
Offutt AFB, Nebraska

I was a copilot on a KC-135R crew on a 2-week deployment to Roosevelt Roads NAS, Puerto Rico. We were providing air-refueling support to the *Theodore Roosevelt* carrier battlegroup as they participated in a COMPTUEX. A COMPTUEX is one of a series of training exercises a carrier and its aircraft and support ships will undergo before departing on their 6-month deployment. This COMPTUEX was the first time all components of the battlegroup were assembled to train and work as a unit. At the end of the training, a 3-day mock "war" would be staged to give the trainers an opportunity to step back and let the new trainees perform their duties.

Our crew was working very efficiently together as we were now well into the second week of our deployment and the second day of the "war." During the first week and a half, we had experienced very few problems. However, on the first day of the "war," we noticed an increasing number of aircraft violating the "protected" airspace around the tanker. The SPINs (Special Instructions) for this exercise directed that nonrefueling aircraft avoid the tanker by 1,000 feet vertically and 5 miles horizontally.

During the previous night's sortie, we had to query the shipboard controller several times about aircraft crossing directly across our flightpath, co-altitude, and well within 5 miles. Despite our repeated inquiries, we received less than adequate results. In fact, it was such a concern that the aircraft commander finally had to express his "displeasure" with the way these situations were being handled. However, judging by the terse, matter-of-fact response we received, our concerns were falling on deaf ears.

So there I was the next day, sitting in the jumpseat of my KC-135R, backing up the other copilot who was running the fuel panel while the aircraft commander was flying and generally helping maintain situational awareness for the crew. We had been on station almost 45 minutes and had one receiver in contact and three on the wing when we received a call from another fighter inbound for "happy hour," ETA 5 minutes. As we reached the southern end of our orbit, we began a left turn back to a northerly heading. At the same time, our receiver

disconnected and began a descending right turn away from the tanker.

Once we rolled out on our northerly heading, the next receiver came up for fuel, and the navigator began scanning for the next inbound. He had been doing very well this trip skin painting inbound receivers while they were still miles away, and it was no surprise when he called out traffic at 10 o'clock and 8 miles. I looked up and out the pilot's side window and noted a small black speck at the position indicated. I acknowledged that I saw the traffic as well. This must be the receiver who called in just a few minutes ago.

As the nav continued to call off the rapidly decreasing range of the traffic, I remembered a lesson from early in my flying training. An instructor once told me that if you ever saw another aircraft remaining stationary in your windscreen, you were on a collision course. As I watched our "receiver" get bigger and bigger in the same spot in the pilot's window, I began to grow concerned. The range was now less than 5 miles, and the aircraft did not appear to be making a bid to join with us.

I noticed the aircraft commander looking out the window at the traffic, but asked anyway, "Pilot, do you see that guy?" He did, and was watching, as were we all at that point, the black speck form into the recognizable outline of an F/A-18 Hornet. Three miles now, and still the aircraft had not given any indication of joining to the tanker.

I began to reach for my wafer switch at the IP station. Before I could, I heard the aircraft commander's voice over the radio. "TEXACO 27, BREAKAWAY, BREAKAWAY, BREAKAWAY!" Now there was no doubt about it! That Hornet was going to come right through the pilot's side window unless we did something about it.

At this point, time seemed to slow down. From the jumpseat, I watched the next 2 seconds unfold in about 2 hours. About half a heartbeat after calling the breakaway, which signaled the receiver in contact to get away from the tanker, I began to feel light in my seat as the aircraft commander made a sharp descent to get out of the path of the approaching fighter. The boom operator, oblivious to what was going on up front and, no doubt, a little startled, keyed his mike and yelled, "Hey!" as he floated to the top of the boom pod.

As I continued to watch the fighter cross our centerline (avoiding collision by no more than 15 feet), I could have told you the color of the pilot's eyes if I'd had the presence of mind to look. Suddenly, the Hornet rolled belly up to us and pulled hard to get away. Apparently he saw us at the last moment, but as he was already across our centerline, it would have been too late.

As the pilot recovered to level flight, silence was the only sound to be heard. Ten seconds went by—then 20, then 30. Finally, our receiver, the one who had to perform the breakaway, broke the silence with, "TEXACO 27...uh...I think I've got all the gas I need. I'm RTB."

Once things got calmed down again, and between receivers, the aircraft commander—with amazing restraint—gave to the controllers the most polite, most professional tongue-lashing I've ever heard. He announced his intention to file a HATR (Hazardous Air Traffic Report) when he landed and advised the ship to be expecting his call. Much to his credit, he continued the mission until the end of our scheduled block time before recovering. I don't think I could have.

The next day, after talking to the pilot of the Hornet and safety personnel on the ship, we reconstructed what happened. When we began our left turn to the north, the receiver we had just finished refueling began a right turn to an approximate 060 heading. He then climbed to his assigned CAP altitude, which just happened to be the same as our refueling altitude. At this point, the fighter and tanker were on a converging heading, co-altitude, and the pilot of the Hornet was looking down inside his cockpit, planning for the next phase of the mission. He never saw the tanker until he heard the BREAKAWAY call and looked up.

For our part, what we were doing as a crew was of vital importance in avoiding this potential midair collision, which would have certainly killed the fighter pilot and everyone in the tanker. The navigator's talent at painting inbound receivers gave us awareness of the conflict early and gave us the time to watch and develop that "this doesn't feel right" feeling. The pilot maintained a close watch on the approaching aircraft and took the necessary avoiding action promptly and decisively to resolve the conflict. For my part, I learned an extra set of eyes in the jumpseat can give you that extra edge you might need under similar circumstances.

In closing, I think these are the lessons to be learned from this scenario:

1. When operating under VFR "See and Avoid," do just that. Even if you're under some form of radar control, your eyes may be the only things that avert a midair collision.

2. Whether you're operating under exercise or real world rules, a thorough knowledge of SPINs and ATO (Air Tasking Order) procedures is essential. You should be especially aware of aspects that apply to the safe conduct of your particular mission.

3. When operating procedures are being violated, especially those that compromise safety, ***speak up***. Your voice may be the last link in the chain. ✈

Official USAF Photo

Don't Die Getting Your ATP... Pilot in Command?

CAPT CRAIG DeBONI
80 FTW/SE
Sheppard AFB, Texas

I recently attended a pay-your-fee, get-your-ATP (Airline Transport Pilot license) course. Like many military aviators, I am facing the possibility of making the transition from military to civil aviation and wanted to get my ATP as painlessly as possible. With a pocket full of money, I showed up at one of the many quickie ATP courses which are popping up all over the country. My going-in position: "Cooperate and graduate. Don't rock the boat. Get my 2 to 3 hours in a twin, stumble through the check ride, and leave with my ATP."

The weather was terrible most of the day. Around 1600, the fog began to lift, and within the hour the clouds had given way to severe clear conditions. They paired me up with an AT-38 instructor pilot (IP), a former Eagle Driver. Normally, they stick one guy in the back to watch and learn as the other guy flies, and then you swap seats.

We stepped to the PA-44 Seminole. I asked the IP(?) how the weather/ winds were. And like most questions he didn't have the answer for, he said, "Don't worry about it. You don't need to know that." It appeared as though we were on a need-to-know basis when it came to system knowledge or anything else, for that matter.

My flying partner flew the first leg, and the sortie was reasonably uneventful except for the fact that the IP(?) managed to mess up the navigational aids causing us to fly off of the backup, non-slaved, upside-down needle-swinging "hutchamajigger" that I had never seen in military aviation. Then it was my turn....

By the time I reached the No. 1 position, night was rapidly approaching. "Nothing like learning a new plane at night," I thought to myself. The tower had closed, so we cleared ourselves for takeoff. I noticed the wind sock indicated a direct crosswind at about 10 knots.

After getting airborne, I flew to the delay airfield which was situated about 20 miles west of my departure field. I managed to slug through a couple of instrument approaches with all the skill of a brain surgeon attempting a delicate surgery while wearing boxing gloves. After three approaches, we went to the area for stalls, steep turns, and slow flight. By now it was night.

The area profile was uneventful until we reached the portion where the IP(?) simulates an engine failure by leaning the mixture on a given engine. I accomplished the appropriate "Bold Face" for a single-engine failure in flight and then shut down the engine and feathered the prop. (Unlike the military, civilians can actually shut down engines during flight.)

After a minute or so of flying the plane with one engine, the IP(?) directed me to restart the engine. So I engaged the starter and—nothing. I tried again. Nothing. The propeller didn't even turn. The IP(?) assumed control of the aircraft. He spent the next 5 minutes in futile attempts to start the engine and finally reached the conclusion that the "Bendix" was bad. "Bendix? Appendix? Whatever!" I didn't have a clue as to what he was talking about, so I took his word for it.

But, being a CRM (crew resource management) type of guy, I tried to think about how I could be helpful. I looked at the approach plate and said, "Emergency safe altitude in this area is 3,200 feet." The IP said, "Don't worry about that," as he continued futile engine start attempts.

I decided to float him another CRM balloon. "Hey, our out base is right off the nose at 5 miles. Is that where we're headed?" "No! No! It's going to start up any minute. We'll head back to the home field," insisted the IP(?).

Okay, I thought to myself. I have 1 hour of experience in this plane, and he is an instructor, so I guess he knows what he is doing.

Okay, I thought to myself. I have 1 hour of experience in this plane, and he is an instructor, so I guess he knows what he is doing. We proceeded to overfly the delay field en route to our departure base. My flying partner and I became very quiet. As we approached the last suitable landing field prior to being committed to our original destination, I decided to float one more CRM balloon.

"Should we declare an emergency?" (knowing perfectly well the answer to that question). "No! We don't need to do that..." as his words faded off into some mumbling about "too much paperwork." "What's your plan if we lose the other engine?" I asked. "That won't happen," the IP(?) retorted. "Famous last words," my silent flying partner finally chimed in from the backseat. But neither one of us pursued it. "Cooperate and graduate. Don't rock the boat." Those words were still echoing in our minds.

Five minutes later we arrived at the departure field. The IP set up for a left base to the runway we had departed from. He configured the plane and rolled out on a half-mile final. Unbeknownst to us, we now had a 15-knot tailwind. As we rolled out on final, I noticed we were extremely steep. Matter of fact, the VASI indication was white. No, not white-over-white. Just white! We couldn't even see the bottom VASI.

I said, "We're really high! Are you going to make this???" The IP yelled, "I got it. I got it," said in much the same tone you would expect to hear on a CVR tape seconds before ground impact and explosion.

He slipped the aircraft and lowered full flaps. I think if he had the time, he would have opened his door to create more drag as we crossed the runway threshold about 50 feet high, still 40 knots above touchdown speed. He attempted to flare and finally just slammed the plane on the runway with 1,300 feet remaining, still 30 knots fast. He immediately locked the brakes, and we entered a skid. He released the brakes, and we proceeded to go in and out of skid until we slid to a stop with 10 feet of runway remaining. Thank God for heavy-duty brakes which this Seminole had installed on it.

Finally, we taxied clear. The IP(?) was attempting to make a 90-degree left-hand turn onto the taxiway in the direction of our one operating engine. This was not working, and we were approaching the grass. I had had enough! "Can we just get a tow back?" I pleaded. Finally, the IP(?) gave in to my request, and we shut down on the taxiway.

As my flying partner and I walked down the unlighted taxiway back to the hangar, we decided we both were "idiots" for not being more assertive. We carefully evaluated our experience and will share with you what we have learned.

1. Your IP/PIC may not be as "qualified" as you had imagined. We were both under the false assumption that our 30-year-old IP(?) had at least 1,500 hours and his ATP. Not true. In order to instruct the flying portion of the ATP prep, a pilot need have only a CFII (minimum of around 275 hours according to FAR 61).

2. Even though you have only 1 hour in a type of aircraft, you may have infinitely more airmanship than the PIC. (In this case, my partner and I had over 4,000 hours more flight time.)

3. Finally, your military wings carry with them the responsibility of acting like a professional aviator no matter the capacity in which you are using them. Don't lower your level of professionalism in an effort "not to rock the boat." "Cooperate and graduate" only works if you live to receive your ATP.✈

TIW from TACAMO

Till the Fat Lady Sings

LT BERT FREYTES
VQ-3, Tinker AFB, Oklahoma

There we were, on a dark night on vectors to SEATO to shoot the full approach into SUU (Travis AFB, California). With a very confident and well-rounded copilot in the left seat, I was sure this would be an uneventful end to a very long day.

As we passed through 4,000 feet MSL, the copilot called for the flaps 14, and as the flaps began to travel, we got an immediate unexpected reaction from the flight engineer. "Wow! What the hell!" He immediately reported that while the flaps were moving, we had lost 2 to 3 gallons of hydraulic fluid. We initiated the Leak Isolation Checklist, declared an emergency, and requested holding so we could assess our situation.

With the copilot flying us in to holding and the navigator backing us up on the navigation and radios, myself and the other two flight engineers ran the checklist and tried to make a bit of sense out of our situation. Even after running through the checklist, the only thing we knew for certain was that the only loss of fluid occurred during flap movement.

So with the information at hand, we deducted that the most probable place for the leak would be one of the two hydraulic flap motors. At this time, we elected to leave the Electric Flap Arming switch to on and ran the flaps electrically. After a quick seat swap to put me in the left seat for the landing, we began the approach. With steady quantity in the landing configuration, and 15 extra knots added to our Vref (in the event the Leading Edges blew back...or just for Mom and the kids), we executed an uneventful full-stop landing.

Post-flight inspection revealed that the No. 2 utility pump case drainline had been cut by a clamp which held the lines in a bundle. With flap movement, the flap motors created enough of a demand to leak 2 gallons. However, the demand on the system from raising the gear would have totally depleted the system and would have put us in a completely different scenario.

It's never over "till the fat lady sings!" ✈

Good Training and Crew Coordination

AD1 J. A. SMIES
VQ-3, Tinker AFB, Oklahoma

It was about 3 days before Christmas, and we were flying back from Travis AFB after an uneventful, but full, 18-day deployment. I had received my instructor upgrade for engineer and was feeling pretty good about my abilities. The whole crew was quite experienced from the AC/MC on down.

We had done an adequate preflight, and we took off at about 30 minutes before dawn with a 3.5-hour flight planned. The flight was beautiful as we climbed out from Travis and watched the winter sun rise up over the Sierra Nevadas. We all had a good case of gethomeitis.

We were overhead Albuquerque, and I got up from the engineer seat to get a drink of water. In the time it took to do that (about 3 minutes), our hydraulic quantity gauge went from 10.7 gallons to below zero. I noticed this and only thought someone was playing a joke on me, so I didn't say anything right away.

After about 20 minutes, I decided to swallow my pride and say something to the AC. We had no indication of a leak as the hydraulic pumps were all reading about 3,000 psi. We discussed the fact that the gauge could be bad and also that there was no demand on the system so this would be a normal indication.

As we got closer to home (Tinker AFB), we decided to extend the gear which would surely put a load on the pumps. Sure enough, the gear went down, and so did the pressure on the pumps.

Fortunately, the gear did get down, but we had just begun. We went into a holding pattern and started to perform the loss of utility hydraulics checklist. At this point, I was glad I had received all the training I did.

The crew worked together and discussed our options available. By the time we were ready to land, everybody was very comfortable. The landing went flawlessly, and we were towed back to the hangar. We were all a little more secure in the aircrew coordination training we are put through every year. Good luck, happy flying, and remember this could happen to you. So be prepared. ✈

Inexperience Saves the Day

After several hours of box-swapping, gear unloading and loading, and preflight...our patience and enthusiasm were waning.

Official USN Photo

LT SHAWN C. CASH
Courtesy *Approach*, Jan 98

Shortly after I arrived at my first fleet squadron, two of our Hawkeyes were to fly from NAS Norfolk to NAS Cecil Field to support a missilex off the coast of Florida. The day began with a 0600 brief and a 0730 launch for a routine 2-hour flight. There was a large storm brewing over North and South Carolina that we were able to go around.

We landed, briefed again, manned up for the missile shoot, and proceeded to have both aircraft's radars go down, effectively canceling the exercise. Fortunately, the next day had been designated a backup day. Both crews re-filed, briefed, and manned up around 1400 for the flight back to Norfolk.

After several hours of box-swapping, gear unloading and loading, and preflights with the August sun cooking the asphalt to temperatures of 100 degrees (that's wet heat), our patience and enthusiasm were waning. Nevertheless, we logged 2 more hours back home, half of it IFR, through the aforementioned storm that was quickly becoming a real humdinger.

We landed, expecting to stay the night and give it another shot in the morning. As I exited the main entrance hatch behind the CAPC (carrier aircraft plane commander), I heard the plane captain ask, "Sir, how soon will you be taking off? We were told to gas the bird and shoot you back to Cecil."

It was now about 1800 as we wearily went back to the ready room to prepare. Mercifully, the maintainers noted several discrepancies which would delay the launch long enough for us to get something to eat. The other crew launched back to Cecil.

Our crew was at the O Club grumbling about our fate. As the most junior member of the crew, and not wanting to look like a non-hacker, I held my tongue for as long as I could while everyone complained about our predicament. The CAPC was probably the most sensible and respected aviator in our squadron, and the CICO (combat information center officer) was the senior lieutenant. Yet I was amazed that no one to this point had even mentioned throwing in the towel. I felt guilty that the thought had even crossed my mind.

Finally, it was too much, and I had to speak my mind. I told them I knew that we were in the fleet and that crew day was a concept, not a practice. However, we were about to start our fourth man-up of the day, launch into a serious storm, at night, 15 hours after our first brief of the day, just to be the backup bird for a training mission.

"How will the mishap report read?" I asked. I guess giving all the factors in one sentence made lights come on. Instantly, the group decided that we would call it a night and start fresh the next morning, which we did.

Aviators are achievers by nature, not accustomed to failure. They constantly push their own envelopes of stamina, determination, and personal comfort level to accomplish the mission. But somewhere there is a physical limit, past which danger lurks. The seasoned aviator, as he again exceeds an old limit by only a wee bit, will be the least likely to raise the red flag, even if things move into the danger zone.

The wide-eyed novice, with his pucker-indicator pegged, but his blind faith in his mentor unshaken, must overcome his reluctance to voice his opinion at the risk of appearing meek, because at that very moment he may be in the very best position to save the crew from a grave error. His internal survival alarms have not been dulled by experience. And his timid questioning of a procedure or decision may be all it takes for the old man to adopt a more conservative course of action that may avert disaster. ✈

DIVERSE DEPARTURES

What Are They and Why Do I Care?

USAF Photo by SrA. Jeffrey Allen

CAPT J. C. FINDLEY
USAF Advanced Instrument School

AFI 11-203, Vol III, is replacing AFI 11-206, which replaced AFR 60-16. When it does, a fourth way to depart a field IFR will be authorized. Diverse departures will be the fourth method authorized. All this leads to an interesting question: What the heck is a diverse departure?

When an airfield has an IAP built, that airfield is also surveyed for IFR departures. The exact location and height of the terrain and man-made objects around the field are plotted. Then the TERPster checks to see if any of these objects should be considered obstacles. An "obstacle" is any object, man-made or terrain, that penetrates an obstacle identification surface.

Say what? Bear with me through a little technical mumbo-jumbo. When the TERPster builds a departure, the first thing he or she looks at is the departure end of each runway, an area starting at the DER (departure end of runway) and going out 500 feet either side of centerline. It starts no higher than 35 feet above DER elevation and climbs at 152 feet/NM out to 2 miles.

On Air Force and Navy bases, the OIS starts *at* DER elevation. The sides start at 500 feet either side of centerline and grow at a 15-degree angle out to the 2-mile point. (See figure 1.) This is where your "protected" area starts. In TERPs language, this is Zone One. We have to climb at 200 feet/NM. This will build 48 feet/NM of obstacle clearance as we fly. If you fly 200 feet/NM for the 2 miles, you will be at 400 feet. Sound familiar?

We have to be at the DER and 400 feet above airport elevation before starting any turns. This keeps us in Zone One until we turn. But what about after that? That is where Zones Two and Three come in. Zone Two extends radially from a point on the runway centerline, located 2,000 feet from the approach end of the runway (see figure 2), and extends out at 152 feet/NM until it reaches the minimum altitude required for en route operations. Zone Three is the same but looking the opposite direction. (See figure 3.)

The TERPs manual and the AIM say that if no obstacles penetrate the obstacle identification surface, no IFR departure procedure will be published. What this means to a pilot is that if there is not an IFR departure procedure published, then you should be able to climb run-

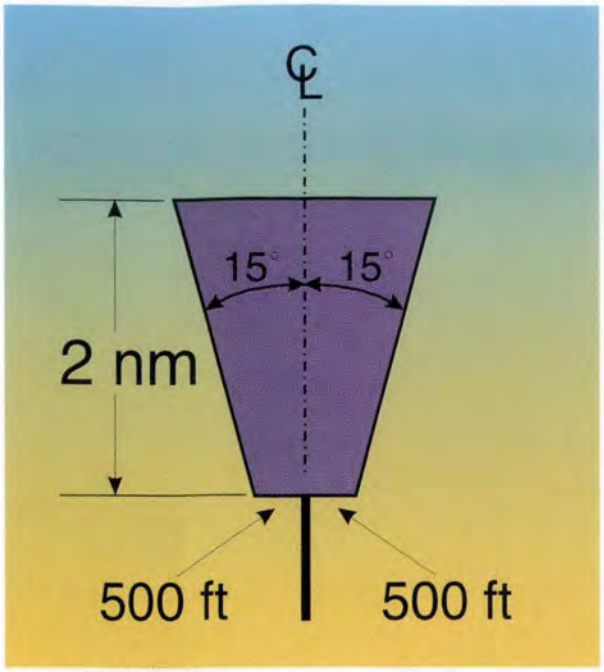


Figure 1 Zone One

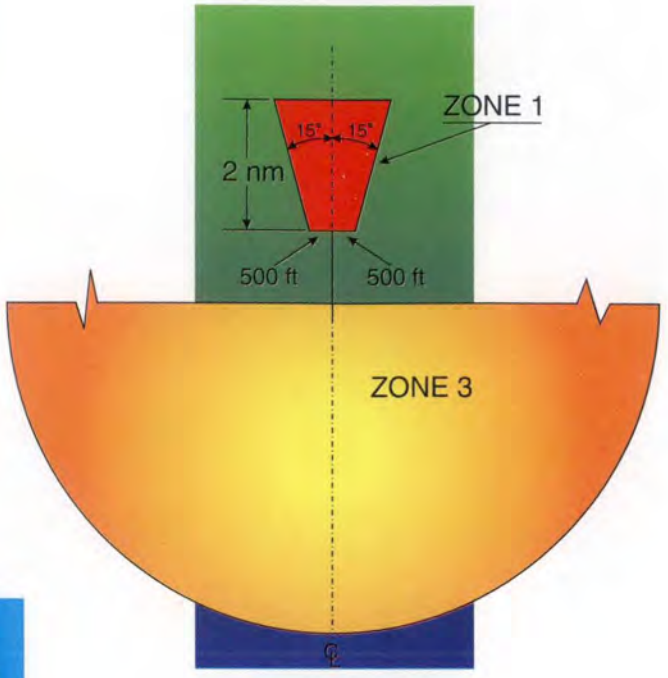


Figure 3 Zone Three

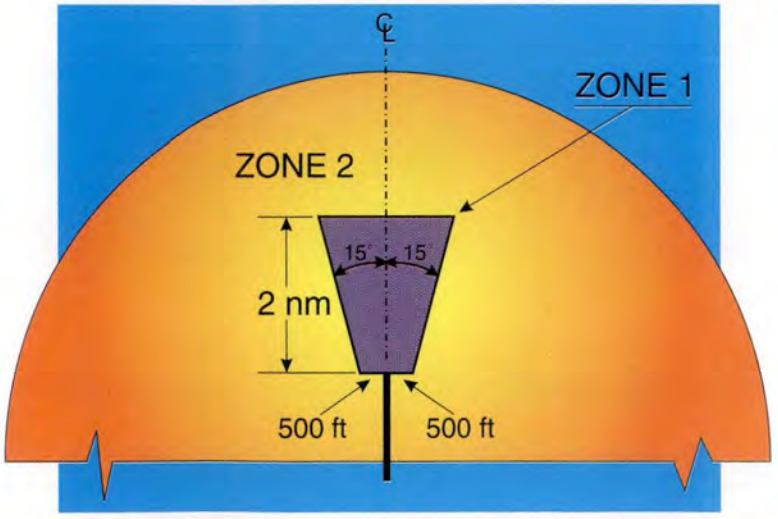


Figure 2 Zone Two

way heading to 400 feet above airfield elevation, turn in the shortest direction to your first filed point, and be clear of terrain as long as you climb at 200 feet/NM.

How does a controller give you a diverse departure? The words "cleared as filed" mean that if there is not an IFR departure procedure, you can take off, climb to 400 feet, and turn in the shortest direction to your first filed point.

What if there is a published IFR departure procedure (the trouble T)? FAAH 7110.65 (Air Traffic Control's regulation) guidance says that if you are "cleared as filed" and there is a published IFR departure procedure, it is the pilot's prerogative to fly the published instrument departure procedure. Air Force pilots will be required to fly the published IFR departure procedure if you are "cleared as filed" and there is a published IFR departure procedure for the runway you are departing. The only way to guarantee obstacle clearance is to fly the published instrument departure procedure, *then* direct to your first filed point. If you are "cleared as filed," you are ***cleared*** to fly the IFR departure procedure as published, then direct to your first filed point.

I'll make one final point. If you are departing a field that does not have an instrument approach, you may not take off IFR. The field has *not* been surveyed for obstacles that could affect your departure. The only way to legally and safely leave is to take off VFR and fly VFR to your next destination or take off VFR with VMC weather up to an IFR MEA, MSA, MVA, etc., and then pick up an IFR clearance from there.

Take care and fly safe! ✈

Constant Vigilance: Why Pilots Are the

USAF Photo by SSgt Steve Thurow

"It would be nice, one day, to know which of my thoughts are mine alone and which of them are common to all the people who fly fighter airplanes."

Richard Bach
Stranger to the Ground

MAJ "WOODY" WOODWORTH
122d Fighter Wing
Fort Wayne, Indiana

As one who has been around fighter aviation long enough to officially wear the title of "old timer," I can truly say "...it's all well and good until someone pokes out an eye!" While the origin of this movie punch line escapes me at the moment, I know that concerns for a sound, safe flying operation just never go away. While programs with acronyms like CRM and ORM are either in place or around the corner, we'll probably never retire "Blue 4 News," reading the often grim downside to this business.

Another well-worn phrase, Ops Tempo, has crept into our jargon as much as any 3-1 terminology. In my unit, a Guard F-16 squadron, any notion of being in a "flying club" is a joke—we are running at full throttle! Luckily, our pilots, full- and part-time alike, keep the proud tradition and attitude of the fighter pilot alive, "I can make this happen."

Can we? Look at what's on our collective plate right now. An increasingly more capable jet, new training requirements, new checkouts (we've started NVGs), family issues, full-time work constraints versus more Guard commitments, and other variables make it necessary, imperative, that each pilot know his or her own limits and be aware of the limits of others.

Having previously been in a unit when blood was spilled and metal bent, I can attest to the utter shock and pall cast over a bunch of normally fun-loving fighter jocks when disaster strikes. Simply sitting down and assessing one's focus, concentration, and desire at any one time can go a long way to solving some human factor errors before they turn tragic.

Below are a few signals you may have seen in your squadron. Every one of them has happened to me. I don't imply they are danger-

Last Line of Defense

ous nor should you infer that any one circumstance could be fatal. What I prefer to think is that these are examples of what we don't want in our current squadron culture—little things that could conceivably turn into a big, unfortunate thing. They are examples of what could be the first chink in our armor—things that our last line of defense, our pilots, can easily spot and correct.

• A pilot shows up 30 minutes prior to brief, only to notice he needs Hanging Harness and/or a SEPT prior to flight. Where is his focus? On preparation for the flight or completing (quickly) the training squares? Chances are—somewhere in between. When he hurriedly arrives to make the flight briefing, will he be mentally ready? Probably not!

In this case, the flight lead needs to take note and, if necessary, bring it to the attention of the Ops Sup/Top 3. Perhaps some rescheduling can slip this pilot to a later brief. Perhaps a vigilant fellow pilot can spot this lack of focus better than the "slightly behind" aviator himself. In any case, being behind the power curve is not the way to do business—there's always a new FCIF, or CAPS review, or some other prerequisite to flight. We know it. Just plan time for it.

• A pilot historically steps late to the jet but knows he can read the forms and preflight the aircraft in "a couple of minutes." We've made great strides in our squadron to eliminate the long-winded, past step-time briefings. What I notice, however, is that when a pilot has 10 or 15 minutes to kill between the brief and step time, he'll likely get on the phone to the stockbroker or make airline small talk with anyone willing to listen. Unsat!!

The time from the end of brief until suited up and walking out the door is sacred time. Personal and business calls can wait. B.S. sessions aren't needed either. Here again, other pilots should know better than to interrupt someone getting ready to step. Schedulers are notorious for "getting a little more work done" back in the Scheduling Shop, when in reality a little concentration on the upcoming task (flying a multimillion dollar fighter, remember?) is the priority. I've mentioned this to our enlisted personnel who now eliminate all but mission-critical conversation when pilots are "prepping" to fly.

• A pilot feels behind in the flight briefing, not real sure of the latest SCU change and not too comfortable with the "push-it-up" game plan the flight lead is explaining. A 3-week layoff is a lot, but the pilot reasons that "getting back in the saddle" is no big deal. Wrong! Here's an example where all pilots, especially flight leads, need to take stock of individual flight members' currency and recency.

In a Guard squadron, the level of training/requalification is amazing. We're always updating precision approach currencies or four-ship air-to-air qualifications—we really run the gamut of staying on top of both basic and tactical needs. Don't accept the notion that everyone in the flight is comfortable with the pace of play.

• A pilot ground aborts and rushes to the spare jet, intent on impressing the flight lead with a quick start and taxi. He sets the mood by skipping the exterior preflight and telling the crew chief, "I'll be ready to taxi as soon as you're done." Who's the last line of defense out there on the ramp? A sense of urgency is different than a sense of panic! Don't let wayward fuel trucks, misplaced power carts, or inattentive wing-walkers ruin your (and your aircraft's) day. The pilot is the person in control, whether in the aircraft or out, and the last link in the safety chain.

A good friend of mine reminded me recently that "a sound plan is inherently safe." I would add that a smart pilot is a safe pilot. We place a staggering amount of trust in the people chosen to fly high-performance fighter aircraft. We expect in return a relentless sense of vigilance, constantly looking for and assessing not only our performance, but the performance of those around us, too. When pilots keep one eye out for things that don't pass the common-sense test, then the other eye won't get poked out! ✈

A good friend of mine reminded me recently that "a sound plan is inherently safe." I would add that a smart pilot is a safe pilot.

Maintenan

Beyond Limits

On a routine B-1B training flight, the crew noticed the No. 2 engine RPM, EGT, and fuel flow readings were slightly higher than the other three engines. During postflight inspection, the crew chief discovered foreign object damage (FOD) to the No. 2 engine. The engine was removed and sent to the propulsion shop where 5 IGV flaps and 28 first-stage blades were found damaged beyond limits.

A detailed inspection of the fuselage revealed a screw missing from a panel forward of the No. 2 intake. Records did not indicate when the panel was last installed, but an inspection of the panel's remaining fasteners indicated they were properly secured.

A maintenance team determined the missing fastener had vibrated loose during flight and was ingested either because the screw was the wrong length or its threads were excessively worn.

B-1B aircraft are notoriously susceptible to FOD, and even slight damage to an F101 engine is extremely costly. In 1990 alone, missing fasteners resulted in hundreds of thousands of dollars in damage to F101s. This particular incident required an engine change and caused $80,000 damage to the engine.

Just a reminder: Follow the aircraft-specific tech data when installing panels/doors forward of, or near, engine intakes. Use of improper hardware, or hardware that's outlived its useful service life, is a FOD mishap waiting to happen.

Editor's Note: Since this article first appeared in *Flying Safety* in April 1992, at least 20 additional B-1B engine FODs attributable to stray fasteners, rivets, and jo-bolts have occurred.

The Eyes Have It

The aircraft maintenance environment poses many dangers—jet blast, movable flight control surfaces, sharp corners, heavy toolboxes, electrical shock, and more—but proper training provides the necessary skills to do our job safely and effectively. With experience, we get used to the inherent dangers, maintain situational awareness to keep our coworkers and ourselves safe, and press on with pride. Still, the comfort level that comes from working in familiar, albeit hazardous, surroundings day after day may cause us to drop our guard.

Such was the case when a maintainer helped dry-drain JP-8 fuel from a C-130. Contact with fuel while performing this kind of task isn't uncommon, but precautions must be taken to wash it off as soon as possible afterward and to minimize exposure. During the course of the dry-draining operation, the crew chief accidentally got JP-8 on his bare hands, and sometime after leaving the dry-drain operation, rubbed his eyes—before washing his hands. The effects weren't immediate, so it was nearly 3 hours later that he began experiencing a mild case of blurry vision. That evening at home, he stated his eyes were bothering him. When he awakened the next morning, one eye was swollen completely shut and the other wasn't much better. After a visit to the doctor, a thorough flushing of the eyes, and 2 days on quarters, he was able to return to duty.

Investigation revealed that while C-130 tech data identified fuel as an irritant to skin, eyes, and the respiratory tract, it didn't require use of personal protective equipment (PPE), like nonporous gloves or splash goggles. The JP-8 MSDS (Material Safety Data Sheet) does warn contact may cause mild irritation to the eyes, and because it is more readily absorbed through the

THE Well Done AWARD

Presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

Captain Christian H. Rose
113th Wing
District of Columbia Air National Guard

Captain Christian H. Rose was returning to Andrews AFB, Maryland, in his Block 30 F-16C after having just completed a surface attack training mission as No. 4 of a four-ship flight. Capt Rose was approximately 15 NM southwest of Elizabeth City Coast Guard Air Station/Muni Airport (KECG). His aircraft was climbing through 15,000 feet heading north.

The flight leader directed a "fluid four" formation, and Capt Rose pushed the throttle forward. As Capt Rose moved the throttle, he heard and felt three distinctive bangs, and the engine began to operate with extreme vibration. He immediately informed the flight of this occurrence. The flight leader directed him to KECG and directed No. 3 to provide chase support.

Capt Rose's aircraft engine instruments verified his engine had stalled as the RPM degenerated below idle and the FTIT increased toward 1,000°C. He pulled the throttle to idle and then shut down the engine as the overtemp condition continued. Immediately, the RPM and FTIT decreased as Capt Rose relayed his situation to the flight. The flight leader and No. 2 made several radio calls to Air Traffic Control to inform them of this situation. No. 3 verified there was no visible external damage of Capt Rose's aircraft.

A 4-5,000-foot cloud deck obscured Rose's visual contact with KECG. Capt Rose adeptly maneuvered his "engine-out" F-16C around clouds to set himself up on a base for a modified flameout approach to Runway 10 at KECG. Capt Rose had little time to react, but managed to attempt an engine restart which did not succeed. He left the throttle in the cutoff position. He also jettisoned the external wing fuel tanks and performed an alternate gear extension. This was necessary because the nose gear failed to extend during normal gear lowering. The emergency power unit was operating on hydrazine. The jettisoned tanks hit the ground and fortunately caused negligible damage. He then proceeded to land his aircraft on a 7,214-foot runway which had no overruns or cable. He used the emergency backup jet fuel starter accumulator pressure to provide hydraulic braking to stop the airplane with 1,500 feet runway remaining.

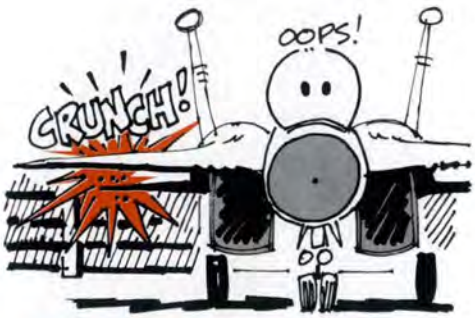
The post incident investigation revealed a No. 4 bearing failure had occurred. This resulted in the loss of radial position control of the aft end of the core rotor. This, in turn, resulted in an engine stall and then stagnation which was unrecoverable. Because of Capt Rose's excellent piloting skills, he was able to analyze his situation, take appropriate action, and immediately land his F-16. As a result of his cool-headed thinking during this potentially disastrous situation, he saved a valuable national resource and prevented loss of life.

WELL DONE! ✈

ce Matters

skin than JP-4, recommends appropriate eye and hand protection be used. Finally, investigation disclosed that the work center training plan hadn't been updated to educate employees on the more insidious effects of contact with JP-8. To prevent accidental poisoning, when working with fuel—or other hazardous substances—it's critical that the appropriate PPE be used, regardless of whether or not aircraft-specific tech data requires it.

Reminder: AFOSH Standard 91-31, *Personal Protective Equipment,* places stringent requirements on commanders and supervisors alike to conduct and properly document hazard assessments in the work environment and take appropriate measures to protect personnel from injury. It further requires developing a job safety training package to cover those hazards, training for all employees, and providing them with proper PPE for the job. And of special note, AFOSH Standard 91-31 requires all Air Force personnel to comply with PPE requirements—*both on-duty and off-duty.*



Strike Eagle Strikes Fence

The F-15E Strike Eagle required an engine run, so a tow team was assembled to move it to the trim pad. Upon reaching the trim pad, the tow supervisor did his best to direct proper positioning of the aircraft but, absent wing walkers and a tail walker, tried to be in too many places at once. The tow supervisor moved out of the tow vehicle operator's line of sight to check clearances and was unable to get the tow vehicle operator's attention when he realized collision with the blast fence was imminent...The Strike Eagle's right stabilator contacted the trim pad blast fence, bringing the tow job to an abrupt halt.

Post-mishap investigation brought the following facts to light: The tow supervisor hadn't provided the necessary pre-tow briefing; obstructions on the trim pad required wing walkers and a tail walker for final aircraft positioning, but none were used; and tow team members had no emergency signaling devices—like whistles—available. These facts underscore the importance of following established procedures. Reminder: AFOSH Standard 127-100 (to be superseded by AFOSH Standard 91-100), *Aircraft Flight Line—Ground Operations and Activities,* makes a pre-tow briefing *mandatory.* It also *requires* use of wing walkers and a tail walker whenever an obstruction lies in the path of an aircraft under tow. And while signaling whistles may have helped prevent the accident, AFOSH Standard 127-100 *requires* the tow vehicle operator to stop a tow upon losing sight (or communication) with the tow supervisor. This event put a valuable combat asset out of commission and cost more than $33,000 to repair.

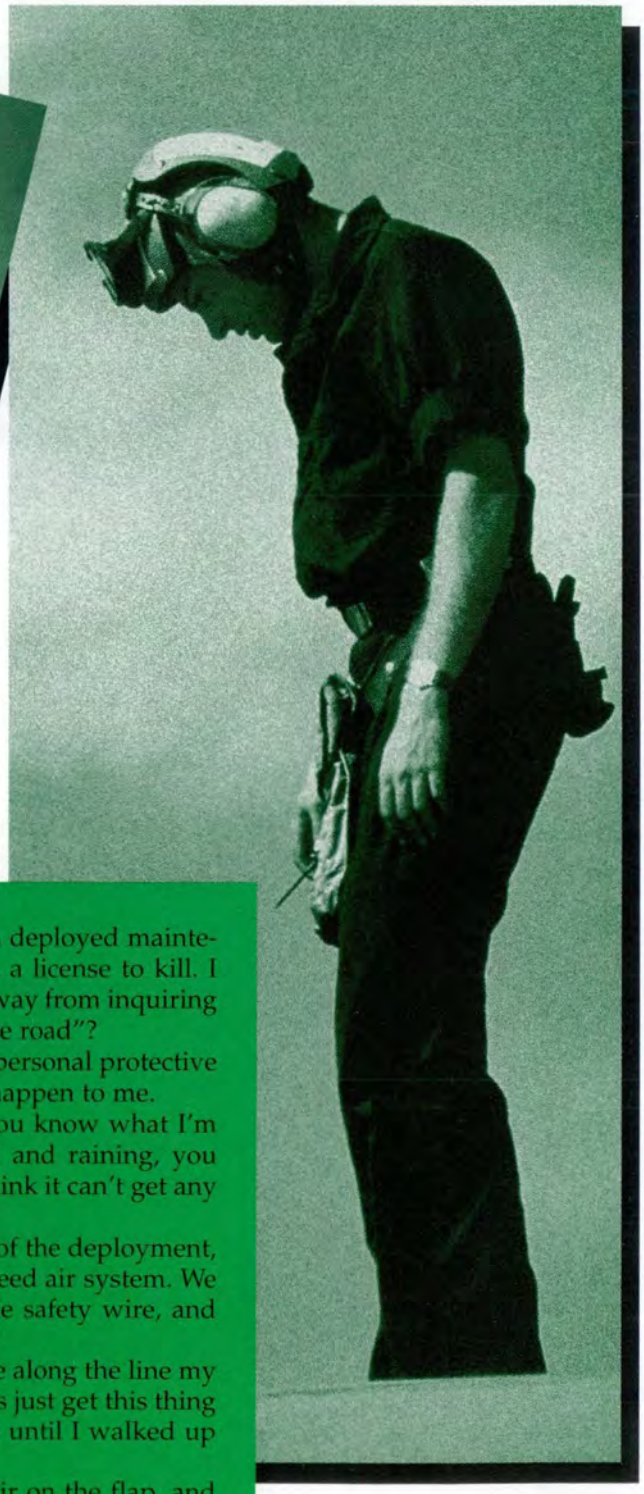
One Tow = Two Toes

It was wintertime at a northern tier base (*cold!*), snowplows had finished plowing snow from the ramp, and it was the tow team's task to move aircraft back to their assigned parking spots. The team worked professionally and with expediency—arctic temperatures providing added incentive—and things proceeded without incident... right up to the point where the tow bar was to be disconnected from the third aircraft moved that day. One of the tow team members started lowering the wheels on the tow bar as the tow super worked to disconnect it.

When the tow team member lowering the wheels suddenly realized the tow super would have the bar disconnected before the wheels were fully lowered, he tried to warn him...but too late. Owing to the cold, the tow team super was wearing mukluks for warmth, and the tow bar landed squarely on top of his mukluk-clad foot, breaking two toes. A painful lesson learned that underscores the importance for clear communications between team members. ✈

Working Without Protective Gear

AMSC P. L. DeLISO
VQ-3, Tinker AFB, Oklahoma



To some aircrewmen, there is no difference between deployed maintenance and home base maintenance. To others, it's a license to kill. I used to subscribe to the latter. After all, you were away from inquiring minds, and who would really know what went on "on the road"?

I never cut corners on safety-of-flight issues, but as for personal protective equipment—come on, give me a break! It's not going to happen to me.

As it happened, once upon a deployment from hell, you know what I'm talking about. Nothing goes right. The weather is cold and raining, you plane-swap to an even worse plane, and just when you think it can't get any worse...

There we were, Colorado Springs in February, last day of the deployment, eagerly changing a firewall shutoff valve in the engine bleed air system. We had a couple of maintenance ladders, a light cart, a little safety wire, and some gum.

I was on and off the wing so many times that someplace along the line my safety helmet and I became detached. What the heck! Let's just get this thing fixed and go home. That plan was working fine right up until I walked up the ladder *into* the drooping leading edge slat.

I put a 2-inch cut on my scalp, left some blood and hair on the flap, and learned a painful and valuable lesson. Take the personal safety gear very seriously, and never get caught out in the cold without it. ✈

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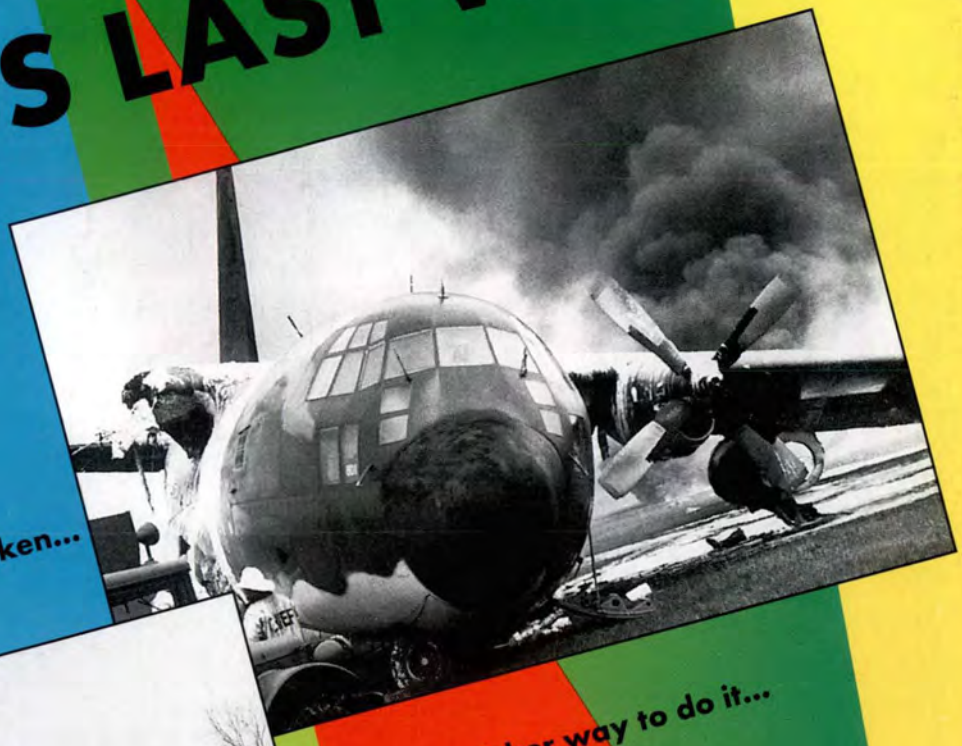
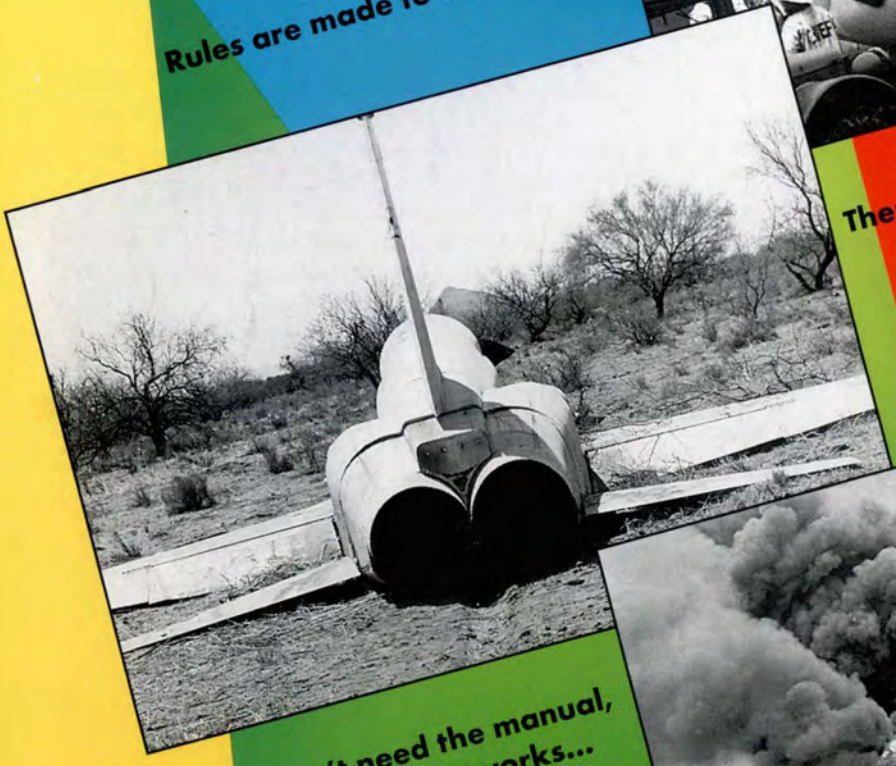
FAMOUS LAST WORDS



Rules are made to be broken...



There's a quicker way to do it...

I don't need the manual,
I know how it works...

Courtesy Maintenance Feedback,
Directorate of Flying Safety,
Australian Defence Force