flying
SAFETY
APRIL 1989

Common Sense, History, and Perspective

Instructing the Negatives

Night Vision Goggles and Tobacco

Communication — What's It All About?

MISSION SUCCESS...What Does It Take?

THERE I WAS

■ On a night, low-level mission in an HH-53 using night vision goggles — we were lead in a two-ship formation going in for a classified, covert, high priority pickup in rough terrain. After going inadvertent IMC twice, we climbed to altitude and started back to the FOB.

Our AC then decided to try one more time while our wingman continued to the FOB. We dropped back down to 200 feet and headed for the pickup point. The weather was bad, and the scanners in the back could barely see the ground using AN/PVS-5s. The pilots had ANVIS-6s and could see better than we could, so they continued.

One-half mile from the LZ, we again inadvertently entered IMC at 200 feet AGL over rising terrain. We went through 50 feet AGL as the AC pulled in full collective and started a 3,000-FPM rate of climb. But because the terrain was rising at almost the same rate as we were climbing, it was a full 2 minutes before we were above 100 feet AGL, and we were in the clouds the whole time.

This time, we terminated the pickup and returned to base at minimum safe altitude. We were IMC most of the way to the FOB. Being mission oriented is important, but not if it means taking an aircraft beyond operational limits and converting it to scattered wreckage on a hillside. Believe me, we all learned a valuable lesson that night! ■

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SPECIAL FEATURES

REGULAR FEATURES

CONTRIBUTIONS

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USAF HAZARD REPORT

HAZARD REPORT NO. *(Assigned by Safety Office)*

I. HAZARD *(To be completed by individual reporting hazard)*

TO: CHIEF OF SAFETY *(Organization and location)*

FROM: *(Optional - Name, Grade and Organization)*

TYPE - MODEL, SERIAL NUMBER, A.G.E./MATERIAL/FACILITIES/PROCEDURE OR HEALTH HAZARD INVOLVED

DESCRIPTION OF HAZARD *(Date, Time, SUMMARY - Who, What, When, Where, How)*

WHAT: An easy way to report all types of hazards on ONE form.

WHEN: Submit anytime you feel a hazard exists in one of the safety disciplines (flight, missile, ground, nuclear, or explosives).

WHO: YOU! (Blue suiters — DAF civilians — anyone who sees a hazard.)

WHY: To prevent an injury or property loss.

HOW: Through your supervisor to the safety officer. If this is *not* feasible, send the AF Form 457 directly to the safety officer — *but send it!*.

RECOMMENDATIONS *(Origi*

DATE RECEIVED	REVIEWING PERSON *(Typed or printed name, grade, and position or title)*	SIGNATURE	DESIGNATED OPR
DATE FORWARDED			SUSPENSE DATE

AF FORM 457
SEP 73

Leadership and SAFETY

TSGT JOHN MULLEN
36th Aircraft Generation Squadron
Bitburg Air Base, Germany

■ Leadership, management, supervision, and safety are words heard throughout the Air Force. Management often is discussed in cold and calculating terms. Supervision is addressed as enforcing regulations because "someone has to do it." And safety is something we hear at rollcall or read in publications such as this.

But leadership is a warm handshake, a gentle prod, a pressed flight suit or set of fatigues that say "Follow me." Few may seek to be a supervisor, and who of us wants to be called manager? All of us want to be remembered as "a leader."

To tell anyone about leadership is a big chunk to bite off. What are my credentials? Well, they are not much — mostly what I have seen.

Based on my experience, I've had some great leaders — both enlisted and officers — who have instilled in me a positive attitude toward safety. Allow me to share with you what I have learned.

While serving as an F-15 crew chief in an aircraft maintenance unit (AMU) at one of our tactical fighter bases, I had my first real exposure to leadership and safety. My AMU flight chief there shared something with me that I would never forget.

He said that whether it be a pilot or another maintenance person, never, under any circumstances, should I sacrifice safety to get a jet in the air. This leader also explained the importance of making correct decisions on things like leaky flight control actuators and paying strict attention to the ejection seat and associated hardware. The latter, I was reminded, is the pilot's last chance for survival should he or she have to leave the aircraft.

Other leaders who incorporated safety in our daily business of maintaining aircraft were the AMU officer in charge (OIC) and noncommissioned officer in charge (NCOIC). Both individuals saw to it that everyone knew the priorities, but didn't take shortcuts to get there.

Through their active participation in listening to the workers, these AMU leaders saw to it that we had the correct equipment to perform our jobs safely. Because they listened, many of our ideas were implemented and became part of the unit goals.

Oh, sure, they worked us overtime when needed, but they also rewarded us with recognition or even a pat on the back when everything was done correctly. These leaders knew that people make safety happen, not just posters or films or a read-file.

Sometime later in that same unit, the wing commander selected my aircraft as his flagship. Coincidence, you say. Perhaps. But I was beaming with pride to feel that a person in such a high position of leadership would trust me to be the dedicated crew chief of his jet.

Here was still another individual who through his style of leadership instilled in me the importance of safety. That senior officer was the kind of person you just wanted to do things "the right way" for.

When he would step to the aircraft to fly, our AMU OIC and NCOIC would meet him at the jet as a courtesy. But the wing commander would walk straight over to me, his young crew chief, give me a warm handshake, and tell me how great *our* jet looked!

You see, because I knew he trusted me with the awesome responsibility of ensuring his aircraft was ready and safe for flight, I would never give him any reason to doubt its airworthiness.

As I look back and think of those various leaders, enlisted and officers, I have come to realize a big part of our Air Force safety program is how we act as professionals and deal with others day to day.

In the long run, we have to have leadership no matter what we call it. With it, we can do almost anything safely. Without it, we are reduced to luck.

Whether the task is one requiring extensive troubleshooting or a simple one involving little preparation, the person ordering the task must be certain that it is not beyond the capability of the individual involved.

Whether we are officer or enlisted, good leadership and safety go hand in hand. Think about the example you set when dealing with others. I do! ■

IFC APPROACH

By the USAF Instrument Flight Center, Randolph AFB, TX 78150-5001

"TAKE SPACING"

MAJOR ED SAFLARSKI
Chief of Bomber Programs
Flight Operations Division
Randolph AFB, Texas

■ How many times have you heard this from your flight lead and never given it a second thought? Here's an account of one crew who thought they had discussed all the possibilities and still "bought the farm."

Scheduled to fly twice that day, the formation members met about noon for pre-mission planning and briefings covering both sorties. The first flight was uneventful, and the crews had about 45 minutes between sorties to review and clarify specific details for the upcoming night flight. Weather that night was severe clear with visibility restricted only by darkness. In fact, it was almost a full moon, and other aircrews who flew that night were unanimous in their opinion that the conditions were "perfect' for night flying.

The formation took off on their second sorties shortly after 1900 and, as briefed, the wingman assumed a 2-mile trail position on the first turn out of traffic en route to the low-level route. The low-level portion of the flight through the IR route was uneventful, with the wingman maintaining 2-mile spacing both visually and with radar.

Upon exiting the low-level route, the formation turned out over an unpopulated area toward the bombing range for several scheduled releases. Eleven miles past the planned separation point, the wingman was directed to "take spacing" and, as pre-briefed, reduced power and started several "S" turns to expedite the maneuver to a 4-mile trail position.

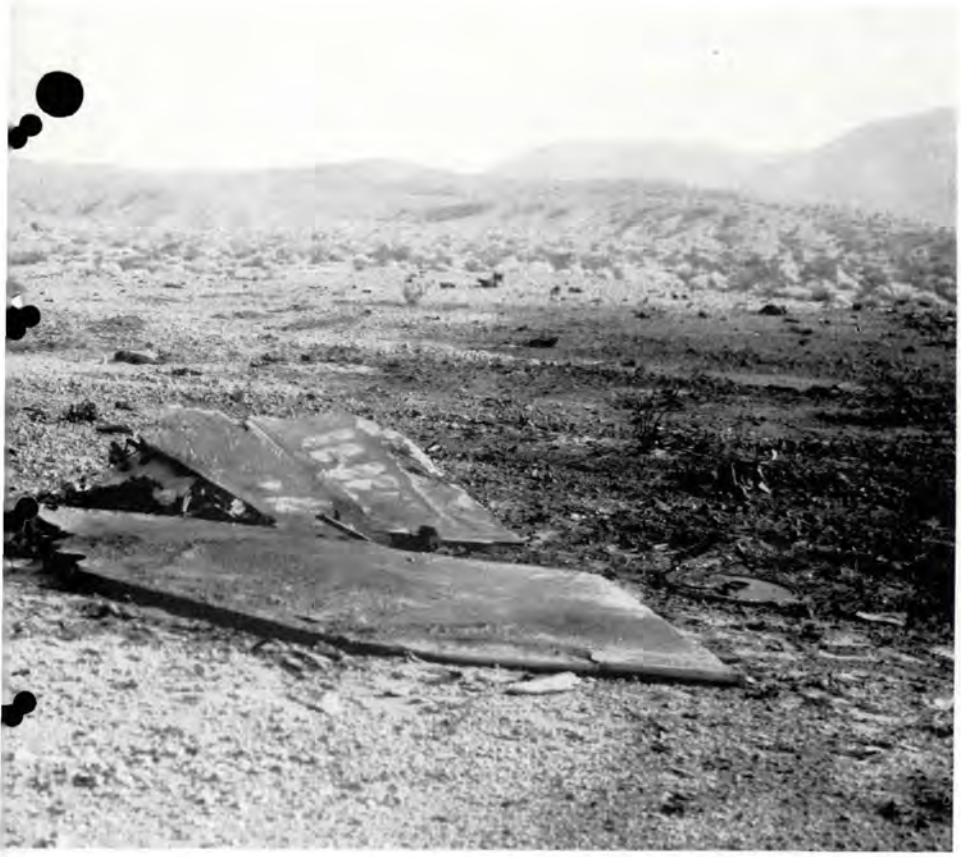
Thirty-five seconds later, lead called as he passed the IP starting his bomb run. Thirty-two seconds after that, the wingman echoed the call commencing his bomb run. Seventeen seconds later, the wingman impacted the ground in a right 35- to 40-degree bank, with a 3-degree descent, and between 500 and 540 knots.

What Went Wrong?

Data gathered from simulation, computer modeling, flight tests, and analysis of impact conditions indicated the crew suffered from a combination of visual illusions and spatial disorientation. The geometry of flying the trail position was also identified as a major factor in this mishap. Let's take a closer look at each of these elements involved.

■ **Night Vision** First, the mishap pilot's night vision at the time of the mishap was probably degraded to a certain extent. Having flown earlier that day, the crew was most likely out of the sun for only the short time it took to rebrief the second sortie. Under optimum conditions, night vision adaptation takes up to 30 minutes. This, coupled with the fact that it was still twilight during the departure, would have extended this adaptation process even more.

■ **Available Light** The moon was also a key factor in the pilot's inability to see properly that night.



The Naval Observatory reported it at 97-percent illumination and, at the time of the mishap, 3 degrees above the horizon. Its position would have placed it about 30 degrees off the run-in heading, severely hindering the pilot's ability to maintain sight of lead or acquire the target complex. This lack of night vision, coupled with insufficient illumination to accommodate day vision would have limited his visual acuity to between 20/100 and 20/200.

■ **References** With the lack of good ground references, the wingman was probably intent upon maintaining good visual spacing, using range information from the WSO and azimuth and elevation information gained by placing the leader's aircraft just above the HUD combining glass. This is a technique used by many pilots during rendezvous and closure to a tanker. The geometry of maintaining spacing in this manner varies according to pilot posture, seat height, airspeed, etc.

Using an average depression angle of 2.4 degrees and a planned 480 KIAS, 2 miles spacing would place the wingman anywhere from 300 to 600 feet below his leader. (See figure 1.) If the lead aircraft flew slightly high, a cross-check of the altimeter by the wingman would indicate that he was not more than a few hundred feet off altitude. Thus, he could consider himself level with the leader and well within tolerances. (In fact, that night, lead flew anywhere from 100 to 400 feet above the planned altitude.)

This safe feeling or complacency manifested itself later in the flight when spacing was increased. As the wingman decreased power to take spacing, he used the same visual cues for vertical and horizontal references as he did at 2 miles. At 4 miles, however, the vertical difference is between 500 and 1,100 feet when at the same speed as the leader. (See figure 2.)

■ **Illusions** In the process of reducing power and slowing, the wingman was also increasing his angle of attack which would cause the leader's light to drop below the top of the combining glass, giving the illusion of climbing slightly in relation to the leader. To compensate for this movement, the wingman would probably have lowered his nose even more.

At the same time, the lead started his own descent from 3,000 feet to the planned bomb run altitude of 1,000 feet. Simultaneous with his power reduction, the wingman started a series of prebriefed "S" turns to accelerate the spacing maneuver. As the distance increased between aircraft, the pilot would have had to concentrate more and more on the leader to keep him in sight. This would force the pilot to keep his head out of the cockpit and away from the instruments.

continued

Figure 1.

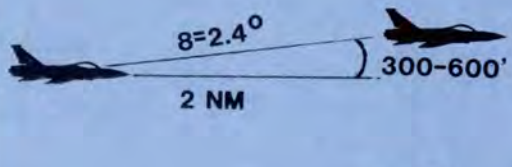
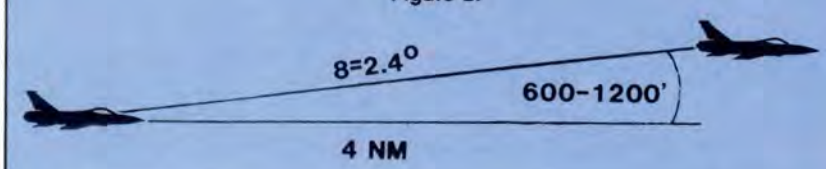


Figure 2.



THE IFC APPROACH: "TAKE SPACING" continued

Another illusion that may have been a factor is the somatogravic illusion. As the pilot approached 4-mile spacing, he would have increased power to maintain position. In doing so, the inertia caused by the acceleration would have given the false sensation of a nose-high attitude and may have caused the pilot to lower the nose.

■ **Channelized Attention** Remember, the moon is in his eyes, giving him an optical acuity of, at best, 20/100. He is flying over an area that is unlit (black hole phenomena) and, therefore, gives no sensation of movement or speed and no discernible horizon. As the bombing run-in is approached, the WSO is shifting his attention from range calls of lead's position to preparing for the bomb deliveries. This channelized attention probably kept either crewmember from actually cross-checking the flight instruments—in particular, the altimeters. The possibility exists that both crewmembers misread their altimeters, but this is considered unlikely.

■ **Last Chance** The one instrument that may have saved the crew is the same instrument that many pilots rely on as a final cue to their altitude — the radar altimeter. In this situation, one of several possibilities may have prevented the system from alerting the crew to their actual altitude. The radar altimeter system may have been completely inoperative, or the voice warning may have failed to activate. The radar altimeter may have been set below 35 feet and, therefore, below tree level in the impact area.

There is, however, another possible explanation. Even if the radar altimeter was set to some meaningful value, the system on this particular aircraft becomes unreliable in bank angles greater than 30 degrees or over certain terrain. As it was, the wingman was making his final turn onto the range complex at a bank angle between 35 and 40 degrees and was obviously outside the limits of the radar altimeter.

■ **Spatial Disorientation** Overwhelming evidence indicates that the crew fell victim to Type I, or unrecognized spatial disorientation which resulted in this mishap. Relaxed and unaware of their situation, the pilot was intent on keeping the leader in sight during the spacing maneuver, while the WSO was preparing for the upcoming bomb run.

Having flown a completely successful first sortie and almost 20 minutes comfortably at "lead's altitude" when directed to take spacing, the crew expected nothing to change except the distance between aircraft. They did not have any idea the flight environment would be so conducive to illusions, spatial disorientation, or insidious weather conditions.

Two Vital Factors

Without outside visual references, a solid instrument cross-check and proper crew coordination could have saved an aircrew. The next time flight lead's briefing includes "take spacing," be aware that it isn't just a power reduction maneuver. It takes proper coordination between the flight members, a good instrument cross-check (by both crewmembers if applicable), and situational awareness, especially with regard to your position in relation to the ground. ■

COMMON SENSE, HISTORY, AND PERSPECTIVE—PART III

This is the final part of a three-article series by Lt Colonel Jim Christol. This month's article is a "big picture" approach to flight mishap prevention. His other articles appeared in the December 1987 and April 1988 issues of the *Flying Safety* magazine.

LT COLONEL JIM CHRISTOL
Directorate of Aerospace Safety

■ In my 19 years in the Air Force, I have been impressed with the flexibility and adaptability of Air Force flying organizations. Most of them are well led and composed of motivated people that know how to get the job done. The extra time and sweat expended result in seemingly routine operations to the casual observer, but actually represent an enviable record of excellence and efficiency. These successful flying organizations are composed of people who have developed a practical perspective on Airmanship, Mission, Teamwork, and Training.

Airmanship

Every now and then, it's useful to honestly reflect upon your own aviation skills and review the basics. The basics include thorough systems and aircraft knowledge, checklist discipline, and the resultant "confident" (not cocky) attitude the pilot takes along on every mission. These areas form a solid foundation of airmanship and should be a part of your disciplined routine.

Systems and Aircraft Knowledge
Know your Dash 1 and learn the low speed and high speed handling characteristics of your aircraft. Familiarity with Section III of your Dash 1 is mandatory! One of my favorite EPs is to quiz the pilot on what effect the loss of main aircraft generators will have on weapons employment, navigational aids, jettison capability, and aircraft lighting (both external and internal). Do the ADI and HSI continue to operate? Do you continue the mission (peacetime or wartime)? How does the ADF work? Does it show relative bearing or magnetic bearing? What's the difference? How do you know if the ADF is working normally? Do the TACAN and VOR indicate relative or magnetic bearing? How about the INS pointer? Does the IFF work?

Correct answers indicate thorough systems knowledge. I know of one "lost" fighter at night that was saved because the pilot used his only remaining NAVAID, the ADF, to find a suitable airport.

Section VI of the Dash 1 discusses flight characteristics. Many of our newer aircraft no longer have the problems with dutch roll and mach

COMMON SENSE, HISTORY, AND PERSPECTIVE — PART III

continued

tuck that were exhibited by older aircraft such as the F-4, F-106, and T-38. The engineers have created flight control systems that automatically compensate for these old problems; however, sometimes these fancy flight control systems can be degraded.

Section VI describes the handling characteristics of your aircraft under both normal and degraded flight control situations. Pay particular respect to weapons delivery, high speed extremely nose low, and low altitude extremely high speed operations. Know when pilot-induced oscillations are likely to occur, and know that stabilator, elevator, and elevon effectiveness may be degraded under certain circumstances. Procedures for emergency dive recoveries (high or low speed) must be second nature.

Checklist Discipline Highly experienced pilots have missed critical checklist items such as the gear handle not down prior to engine start, flaps not in the appropriate position for takeoff or landing, pitot heat not turned on, zero delay lanyards not connected, lap belt not connected prior to takeoff, ejection seat not armed prior to takeoff, canopy not locked, cabin altitude not checked on climb out, and landing gear not lowered prior to landing. Many of these failures occur because the pilot is "rushed" or disregards basic checklist discipline.

A highly successful technique is to discipline yourself to form effective habit patterns. When your habit pattern is interrupted, take positive action to readdress checklist items. When rushed (spare aircraft), consciously force yourself to slow down and methodically follow through in your established habit pattern which covers all checklist items.

Attitude Chances are high that you know your own aviation strengths and weaknesses better than anyone else. Since human factors are major contributors in more than two-thirds of USAF Class A mishaps, it is worthwhile to carefully consider channelized attention, habit pattern interference, SDO, GLC, and other killers as you examine your personal airmanship skills. The confident attitude described earlier comes from a combination of knowledge, skill, experience, motivation, and an honest evaluation of yourself and the effect you have on others. Your airmanship and crew coordination skills have a direct impact on mission accomplishment.

Mission

While mission accomplishment is the bottom line, our sorties demand a high degree of flexibility based upon peacetime or wartime, armament on-board, and scenario complexity.

Peacetime or Wartime This is self-evident. Next time you review your EPs, imagine yourself in various phases of combat situations and note the change (if any) in abort criteria. Apply the same logic after actual training missions. This adds a dimension to your debriefings and serves to generate creative feedback.

Armament on Board Some pilots manage to expend bullets, missiles, and bombs carelessly and hazardously. The peacetime habit pattern

Thorough aircraft systems knowledge could save your life. You must understand your aircraft's handling characteristics under both normal and degraded flight control situations.

of an airborne armament safety check or fence check has led to inadvertent ordnance expenditure. Periodically, one member of a fighter element is shot down by his element mate during live fire missions against a target drone. Recently, one of our reconnaissance aircraft was shot down by a US Navy jet. Habit pattern anomalies, general inattention, and excessive motivation represent some of the human factors involved. Many missions have multiple requirements which must be kept in perspective.

Scenario Complexity Large force and theater force employment missions demand a great deal of planning and coordination. While the need for a silent launch may be real enough, the need for an ontime weapons release should carry greater weight, and minor deviations from the silent launch may be necessary to ensure our mission success.

Even simple mission requirements can lead to interesting scenarios like waiting 20 minutes or more for that critical ontime takeoff only to fight unexpected headwinds and arrive with emergency fuel at destination. Little things can make a big difference. (Do you routinely accept aircraft that have been shorted 500 to 1,000 pounds of fuel?) Maybe it's that way because nobody ever says anything about it. Organizations with effective two-way communications know what teamwork is all about.

Teamwork

The next time your unit participates in an operational readiness exercise, take some time to consider the entire base effort that is required to generate, support, survive, and sustain operations — mobility, weapons loaders, chemical gear, services, civil engineering, decontamination operations, medical, maintenance, WRSK, communications specialists, security police, and flight operations.

Obviously that's only a partial list — but when the conflict begins, you'll need that teamwork, and it must fit into the big picture of multi-MAJCOM, joint, and overall allied operations. It's no accident that many of you have undergone formal multi-MAJCOM inspections recently. That trend could continue — so you should pursue vigorous training which is tailored to enhance combat effectiveness in your part of the big picture.

An on-time weapons release is critical to mission success. Mission accomplishment also demands strict checklist discipline, a confident attitude, and effective crew coordination.

Training

Is the training benefit to be gained worth the risk of exposure? This is the question Air Force leaders constantly face. They impose certain limitations in your training programs (minimum altitudes, ranges, etc.). However, every single operator out there faces that same question routinely (tactics selection, abort criteria, crew rest, low-level exposure time, comfort level, last-minute change in flight composition, actual mission change, etc.). Certainly, your decisions will be tailored to the unique situation at hand, and hopefully, your base and the support mechanisms there give you the aircraft and spares you need to fly the mission as briefed.

Speaking of training, it's nice to train the way you expect to fight, but think about some of the recent mishaps: Midair collisions during administrative formations, using day VMC tactics during night intercepts (remember the targets will be blacked out at night — so why put yourself in a high G and highly disorienting attitude at night?). Use a common-sense approach. You probably will not have your lights on at night either — can your wingman follow you through that vertical maneuver at night?

Train smart for all missions, and strictly adhere to basic formation discipline. With smart, well-thought-out approaches to training, strict discipline enforcement, and a common-sense approach to mission accomplishment, you should decrease significantly the likelihood of becoming a part of the mishap history that occurs over and over again. Keep the big picture in mind, and you will undoubtedly develop a healthy perspective for combat effectiveness. ■

Safety Conference Way Down South

MAJOR STEPHENS F. McCAULEY
The MAC Flyer

Our thanks to Major McCauley for writing this article for us. However, we must point out that the opinions expressed are those of the author, not the management of *Flying Safety*. (Hint: Look in the first paragraph.) Ed.

■ It's nearly mid-November at "Playa Hermosa," and springtime's in full bloom on this eastern bank of the world's widest river — Rio de la Plata. Our international group of safety officers has settled into these beachside Uruguayan Air Force (FAU) retreat accommodations for a week of safety presentations. I count myself fortunate to have been asked by HQ AFISC to make a flight safety presentation here. As part of the deal, I agreed to write this article for *Flying Safety* magazine. (Even though my real employer is *The MAC Flyer*, world's greatest flight safety magazine, we do extend some professional courtesies to our colleague publications.)

Flight safety in the Western Hemisphere is truly an international cooperative effort, so the FAU invited several countries to participate in their annual PREVAC (prevencion de accidentes) meeting. The conference provides an opportunity to share mishap prevention information and accident investigation methods, mutually benefiting each Air Force and furthering the cause of aviation safety.

Getting Acquainted

At a get-acquainted gathering, I'm impressed by the sense of "family" enjoyed by the Uruguayan aviators — it really goes well beyond camaraderie. In spite of austere FAU funding and meager pay, these officers exude a sense of pride and professional dedication which is truly inspirational.

I observe a suspicious-looking vessel being passed among the officers (steam emits from the opening at the top as they drink the contents through a silver straw). I maneuver to avoid its path. Cradled on a leather pedestal, the "mate" gourd (pronounced MAH-tay) is encased by a hairy hide — purportedly a bull's scrotum. The flavor of this herbal tea is quite strong, and I suppose the gauchos must develop a taste for it out of respect for tradition.

Passing the mate, I am introduced to the FAU Chief of Safety, Colonel Correa Luna. (An impressively athletic-looking gentleman — he's just successfully competed in a grueling triathalon.) His personal enthusiasm towards flight safety inspires an infectious team effort among his unit representatives, so I ask how he became so interested in the safety field. His response: "Despues que prende la vacuna, queda enviciado." (Liberal translation: Once you catch the safety bug, you're hooked for life!) Little wonder he was awarded the USAF Flight Safety Award for Meritorious Achievement a couple of years ago!

Down to Business

The formal meetings open with safety presentations and mishap

Because of his infectious interest in flying safety, Col Luna received the USAF Flight Safety Award for Meritorious Service. His motto is "Once you catch the safety bug, you're hooked for life."

Uruguayan aviators enjoy a strong sense of camaraderie and tradition. We celebrated and shared one tradition by sipping "mate."

briefs from the guest speakers. I enjoy an opportunity to present some human factors analysis, attributing my improving Spanish fluency to our luncheon appetizer (boiled cow's tongue). One of the other guest officers makes a point worthy of further reflection: "Young lieutenants never say 'No' to a flying mission, no matter how inherently hazardous it may be. Therein lies danger for supervisors." Good point. Personal ego and peer pressure have been known to provoke younger pilots to "press the mission" beyond their own personal limitations.

Another guest officer engages us in animated discussion about suboptimal "patterns of behavior." For example: Pre-mission briefings which merely fill the square with the blanket statement "briefing items standard."

The agenda for the next few days focuses on topics of special interest for the FAU. They collectively agree to rename their unit level "safety week" programs as "safety festivals." This year's theme: "Errar es humano, pero persevar en error es diabolico!" (To err is human, but to continue to err is inexcusable!)

There are more presentations concerning the FAU's developing safety directive library, and a soon-to-be published "Mishap Investigation Guide for Accident Boards." One officer gives a speech on the negative impact of additional duties on a safety officer's primary tasks. (Sounds familiar.) Finally, ground and industrial safety receive a share of attention, and an oversimplified formula for managing these complex areas is offered in summary: Recognition + Evaluation + Control = Prevention.

The Wrapup

The final day of our conference closes with a festive luncheon featuring an "asado," or roast pig. The pig isn't the only item subject to roasting, however. Bound by tradition, the junior officers seize the opportunity to "roast" each of the convention's speakers — noting every slip-up, Freudian or otherwise. The critiques are a hilarious reflection of the spirit of the occasion.

On parting, I inquire as to how FAU uniform insignia serves to distinguish officer specialty areas (e.g., maintenance, pilot, supply, etc.). A broad grin accompanies the reply from one of my hosts as he exclaims, "We're all gauchos here!" ■

This Uruguayan air base opened its doors for 1988's Accident Prevention Committee.

This committee's rapport represents an important exchange of safety information.

The Accident Prevention Committee is composed of safety professionals with some similar concerns. They gathered to exchange information searching for effective safety programs.

INSTRUCTING THE

LT COL JAMES P. BRONOWSKI, USAFR
Chief, Safety Division
452 AREFW
March AFB, California

■ My unlit cigar is clenched tightly between my teeth as the shape of the KC-135 begins to enlarge slowly in the windscreen. As we approach the Stratotanker from below and behind, more and more stars are blocked from our view by the growing silhouette that appears suspended beneath a black ceiling. The underbody lights give the tanker a strange and sinister appearance so different from its daytime look of grace and speed. It reminds me of the ghostly characteristics our faces would take on when, as youngsters, we would run around in the dark with flashlights held beneath our chins. With my illuminated face interlaced with dark shadows, I could scare the daylights out of my sister and other known enemies.

Inside our KC-10, all is quiet as we anticipate the task ahead: Teaching a new aircraft commander night receiver refueling. The lights have been dimmed to as low a level as possible, all radios have been muted save the one on air refueling frequency, and all the checklists have been completed.

The boom operator nervously adjusts his lapbelt on his seat behind the pilot. I move my cigar to the other side of my mouth and set the instrument lights for the 10th time. The flight engineer stares at the unmoving instruments on his panel, probably in hopes there might be some sign or indication of a mechanical malfunction that would cause us to cancel this portion of the mission. Our lady is quite healthy, however, and we continue our advance into the darkness towards the waiting specter.

Down to Business

I remove the cigar from my mouth, lay it atop the row of light rheostats on my right, and start my job — instructing. As we close to the

NEGATIVES

precontact position, I can almost hear the tanker's boom operator advising his pilots: "We've got a real cowboy back here." I know that hands are tightening around throttles and thumbs are creeping closer to autopilot disconnect buttons as we pitch and roll towards the refueling boom.

The next hour seems to drag by for all concerned. My student is making good progress, and his closure rates have dropped from the speed of sound to a more manageable and controllable rate. He has been able to make three sustained contacts, but he is becoming very fatigued, and the learning curve has flattened out.

"It's time to call it a night," I announce to the crew. From behind, I hear audible sighs of relief and a flurry of activity as checklists are pulled from places of temporary storage.

"I've got it for a while," I tell my fledgling night refueler. "You just relax for a few minutes."

Reflections

I wouldn't admit to him how tired I am. An hour of high intensity activity and instruction will leave its mark on me for the next day or so. I flick on the autopilot and lean back in my seat. I can feel the dampness that has passed from my back to my flight suit to the seat cushion. My back aches from the arch I unconsciously forced in it during the tense moments of teaching a new and difficult skill.

The new aircraft commander will have several more opportunities to improve and practice this most critical maneuver under the cloak of darkness. He will do fine, and I even envy the natural flying talent he has displayed on this very dark night.

Have I done my duty as an instructor this evening? Have I emphasized all the dangers associated with poor techniques and violated procedures? Is he aware of what can happen if he does not know his own limitations? In other words, have I taught him all the negatives?

I know that positive reinforcement is essential in teaching a skill, but it should be used judiciously and at the right time. When performing a motor skill, the brain should have a reference of hazards associated with improper performance of that task. This becomes a significant and very important reinforcement in aircrew instruction.

Back to Business

"Toga seven nine, contact Los Angeles center on one twenty seven four," commands our VHF radio.

The radio transmission breaks me away from my fatigue-induced thoughts. I respond to the instructions given to me by someone 500 miles away, sitting in a darkened room watching converging and diverging green numbers move slowly across a radar screen.

I move my head around to flex my sore neck muscles and note that my left seater is intently studying an approach plate under a shaft of magnified light emitted from the overhead panel. His right hand contains a sandwich with precisely three half-moon indents on one end. On his lap rests the box where the remainder of his monthly quota of carbohydrates, fats, sodium, starches, and cholesterol awaits expeditious consumption.

"Whatcha think of night refueling?" I ask, breaking the silence and reestablishing the student-instructor

continued

relationship.

"It's, aah . . . kind of scary," he responded while chewing a mouthfull of corn chips. "Why did you keep emphasizing such a slow rate of closure to the contact position?"

"Good question," I reply, as I watch him brush crumbs of bread and corn chips off his flight suit, knowing some of those particles will take up permanent residence in the butted seams and crevices of the cockpit floor around his seat. "The human eye cannot detect movement in the dark nearly as well as it can in the light. It is much more difficult to determine your closure rate at night as the normal references the eye uses just aren't there."

As he nods acceptance of my gem of knowledge, his eyes go back to the approach plate which he can read in the dim light without the aid of glasses. I understand the people that create and print approach plates have developed the technique to print an entire approach on the head of a pin. It wasn't much of a breakthrough because the printing is almost that small now.

Attention Step

I can see I'm losing him rapidly as the energy required for digesting that cold and tasteless flight lunch is being supplied by his brain and muscles. I know if I'm going to salvage the lesson, I have to act fast.

"Uh-oh!" I exclaim.

Immediately his attention is diverted from a sleepy study of approach headings and altitudes to the engine instruments. Finding nothing amiss there, he scans all the electric, hydraulic, and fuel gauges in a matter of seconds.

"What's wrong?" he says with noticeable alarm in his voice as he turns to face me.

"Nothing," I respond. "You looked like you were just getting a little too comfortable and might need a slight prod."

This old instructor trick never fails to bring a sense of alertness back to someone who starts to channel their attention. It also tends to irritate them somewhat, but the tradeoff is favorable, so I still do it from time to time.

Hazards

Now that I have his undivided attention, we discuss all the hazards associated with rapid closure rates, including tanker controllability and the possibility of a midair collision. I also relate incidents that resulted from poor techniques or procedures. I get these from the flying safety meetings and command safety publications. This is an excellent method of verifying an instructional point, and it gets the safety message across.

I am now confident he realizes the negative aspects of the receiver air refueling portion of his training. I teach the negatives only after the student has performed the function in the aircraft or the simulator. If an individual is prebriefed on all the dangers associated with a particular task, he or she will develop a mindset that will inhibit rapid learning. The most effective prebrief is one that emphasizes correct procedures and techniques. The instructor's initial job is to instill confidence, not fear. Once the student starts demonstrating confidence and an ability to accomplish the task is the best time to introduce the hazards.

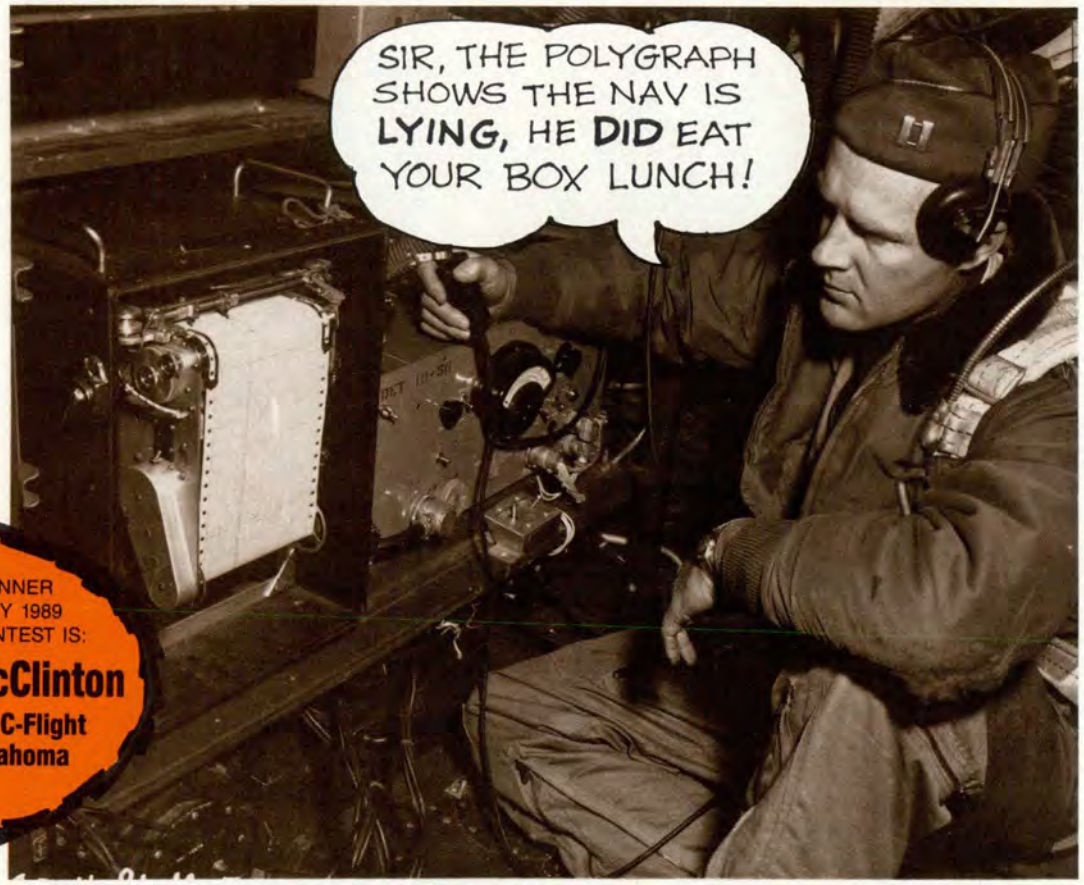
Final Thoughts

It's quiet again as we have about 10 minutes until we start descent. I look out the side window into the darkness below. Small islands of lights are scattered in irregular patterns throughout a sea of black. Five miles beneath us, people are fulfilling the pattern of their evening lives, oblivious to our presence.

I am filled with a warm feeling of accomplishment that is the special compensation given to us instructors. Somewhere along the line, maybe my instruction prevented damage, saved an aircraft, or even saved lives. I'll never know. But I do know that instructing in an aircraft is the best job in the world. ■

Fully loaded, the KC-10 carries more than 356,000 pounds of fuel, almost twice as much as the KC-135. Air refueling one of these 590,000-pound leviathans at night is a demanding task for any pilot. Teaching a new AC requires special techniques and a lot of patience.

Once Again, Thanks For Your Support!



. . . AND THE WINNER
FOR THE JANUARY 1989
DUMB CAPTION CONTEST IS:

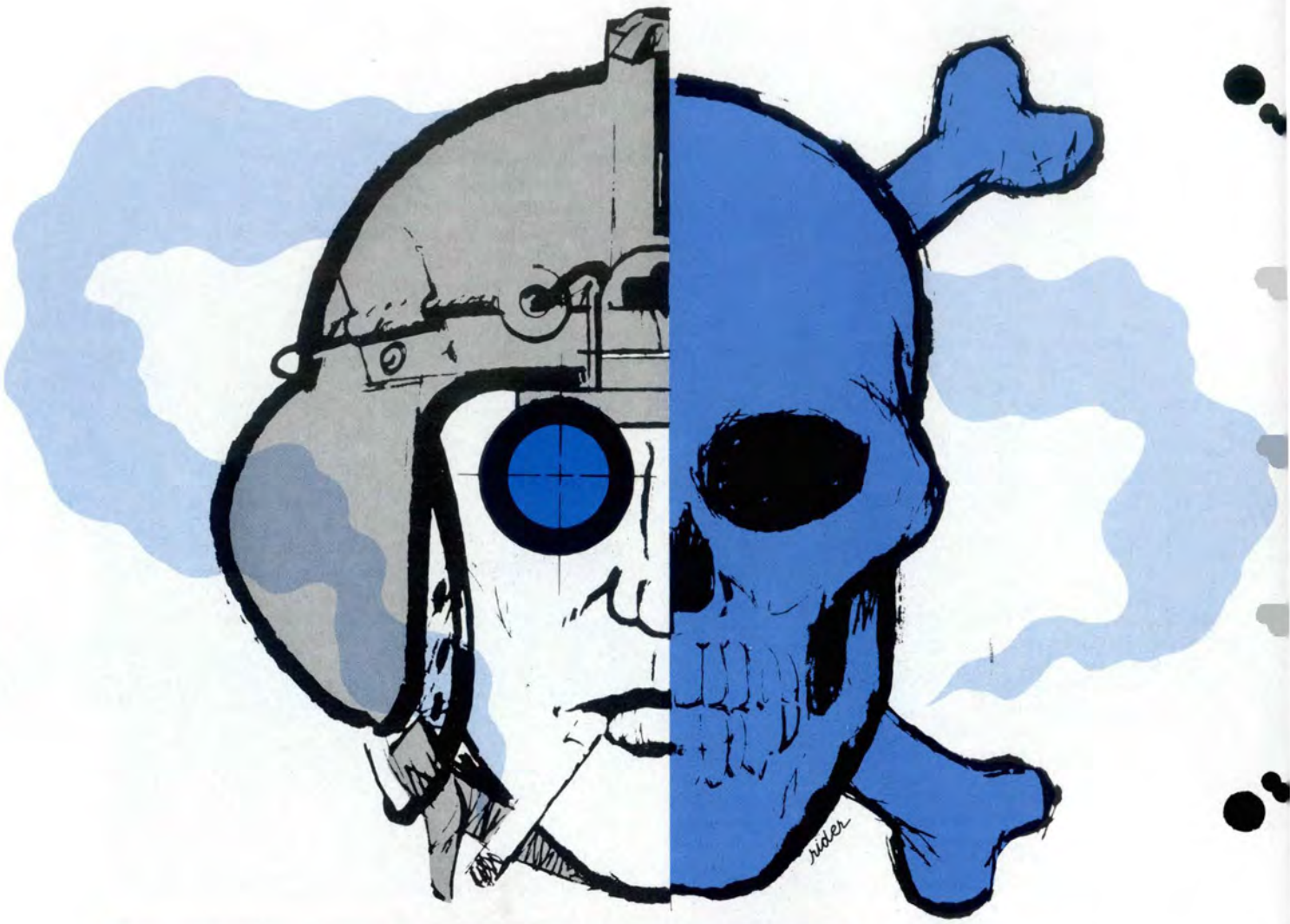
SSgt Victor McClinton
965 AWACS/DOW C-Flight
Tinker AFB, Oklahoma

Okay gang, we admit it! Your talents for dumb humor are approaching the pure genius level. We keep thinking these pictures can only have a few possible approaches, and you keep proving this is just *not* the case. So, congratulations SSgt McClinton — you are our latest winner. Your cheap little prize is in the mail.

Now take a look at the honorable mentions to see how tough the competition is getting. If you really want to be stumped, take a look at our latest contest on the back cover and see if you can beat it.

HONORABLE MENTIONS:

1. **"Good morning Capt Phelps, your mission, should you decide to accept it . . ."**
   Mr. Mark Collins, 944 CAMS/MAECA, Luke AFB, Arizona
2. **No, it's not printing "Pull up!" anymore; it's printing "Pull up you IDIOT!"**
   Mr. Mark Collins, 944 CAMS/MAECA, Luke AFB, Arizona
3. **Nav to pilot . . . your EKG reading erratic, stand by for shocks!**
   TSgt Santos Lara, USAF-CAP/NHLO, Concord, New Hampshire
4. **Hmmm . . . According to this hearing test, I'm totally deaf in my left ear?!!**
   SSgt Craig A. Silver, Myrtle Beach AFB, South Carolina
5. **Budget cuts, smudget cuts! I want a seat to sit in and a real radar scope!**
   SSgt Clairyee A. Dolson, AFAL/TOS, Edwards AFB, California
6. **Col . . . It's a fax from your wife. Don't forget to pick up two loaves of bread and a gallon of milk.**
   MSgt George B.M. Lukens, Jr., 60 AMS/MAAX, Travis AFB, California
7. **How am I going to explain this to the rest of the crew? . . . I really did order toilet paper!**
   MSgt John Spurny, 366 AGS/MAAM, Mountain Home AFB, Idaho
8. **Of course I'm alive back here . . . I can see the needle moving!**
   MSgt John Spurny, 366 AGS/MAAM, Mountain Home AFB, Idaho
9. **Hey, Marty, are you sure the mission called for me to watch this thing constantly? I've been staring at it for 16 hours and it hasn't moved once!**
   Mr. John P. Sortman, 944 CAMS/MAECA, Luke AFB, Arizona
10. **Hey, Joe! Check the pilot and copilot monitors. They're registering zeros here since that last big bang. Joe? . . . JOE?!!!**
    TSgt Danny R. Smith, 186 TRGP MS ANG, Meridian, Mississippi



NIGHT VISION GOGGLES and TOBACCO

LT COLONEL DAVID L. HAMMER, MD, MPH
23 AF Medical Advisor
Hurlburt Field, Florida

■ It is clear that for 23 AF (MAC) to be effective on today's battlefields, it needs to fly low level using terrain masking techniques. To do this at night requires something to improve night vision — night vision goggles (NVG). To operate safely at night, we must understand the benefits and limits of NVGs as they apply to our aircraft and our people. These devices do not turn night into day, they only amplify existing light. SAC and TAC have begun to develop NVG mission scenarios. They will now be sharing some of the problems experienced by 23 AF.

What are NVGs?

They are binocular, electrooptical devices that mount on a flight hel-

met and amplify existing light by means of two image intensifying tubes. This image is focused onto a photocathode receptive to visible and near-IR radiation. The output of the phosphor screen is near the 530 nanometer wavelength portion of visible light. So the image is green, and best case visual acuity is near 20/50 with a 40-degree field of view.

In simple terms, that means using NVGs is like looking through binoculars at a green television screen. The resolution is considerably less than you would like, and your field of view is narrow. You have little or no peripheral vision.

What About Visual Requirements?

Air Force fliers have to meet the visual standards set by the USAF Surgeon General. There are two kinds of fliers: Those who can meet the requirements without glasses, and those who must wear glasses to have satisfactory vision. The bottom line is, if you wear glasses to fly in the daytime, you'll have to wear them at night, too. The idea is to get the best possible vision you can through the NVGs outside the cockpit and around the NVGs inside the cockpit.

However, you can't wear the same glasses you wear in the daytime. The flight surgeon has to special order glasses for you that are compatible with the NVGs.

The goal then is to optimize vision, so how do we do it? Much of what we do is directed toward that goal. Adequate crew rest, proper diet (vitamin A enhances vision), proper sunglasses for protection from daytime glare, oxygen use, and many other efforts are applied to directly or indirectly benefit vision. However, not enough is said about tobacco use.

Tobacco Use

There are two hazards in using tobacco products: Carbon monoxide and nicotine.

Carbon monoxide (CO) There is enough carbon monoxide in tobacco smoke to saturate hemoglobin in smokers to levels as high as 10 to 15 percent.

- Cigarette smoke contains 1 percent CO by volume.
- Pipe smoke contains 2 percent CO by volume.
- Cigar smoke contains 6 percent CO by volume.

Carbon monoxide binds to hemoglobin 250 times more readily than oxygen does. This greatly reduces the oxygen-carrying capacity of the blood and contributes to hypoxia. This affects visual acuity, brightness, visual discrimination, and dark adaptation just as all hypoxia does. (A 5-percent saturation of carboxyhemoglobin has the same effect on visual threshold as an altitude of 8,000 to 10,000 feet.) The retina is very sensitive to otherwise minor oxygen deprivation.

Nicotine Nicotine's effect on the central nervous system is dose dependent, and it can act as both a stimulant and a depressant. The percentage of nicotine varies in different tobacco products. Smoke from the average cigarette delivers 6-8 mg while cigar smoke can deliver as much as 15-40 mg. Smokeless tobacco (chew or snuff) can deliver very high levels. The key is that nicotine decreases blood flow to the retina by constricting the blood vessels and diminishes night vision. This occurs with both smokeless and smoke generated doses.

The Bottom Line

Nicotine alone is significant in its effect, and coupled with carbon monoxide, compounds the visual threat. The data on cigarette and tobacco use continues to pile up and also, continues to be negative. Those who need optimum night vision should avoid using tobacco several hours before a flight, protect their eyes from daylight glare with USAF approved sunglasses, and follow a lifestyle with a vitamin A-rich diet and adequate crew rest. The night flying mission is only beginning and the safety issues are coming to light. Until proper directives are in place, common sense must prevail. ■

FSO'S CORNER

COMBINED SAFETY BULLETIN

CAPTAIN DALE T. PIERCE
919th Special Operations Group
Duke Field, Florida

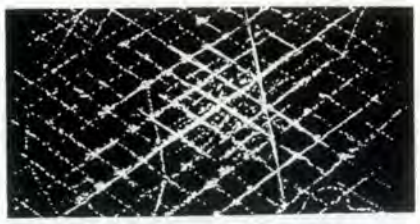
■ How many of us wonder how we might better get the word out? We hold safety meetings, conduct training sessions, perform periodic inspections, and maintain bulletin boards. What else can we do?

The folks at the 303d Tactical Fighter Squadron (TFS) are now publishing a monthly combined safety bulletin (CSB). Their monthly CSB addresses both flight and ground safety issues. Covered are current issues of importance to the majority of people assigned. For example, an upcoming cold weather exercise and elevations in meters on Alaska JOGs.

The monthly CSB is short and to the point, fits on one side of a sheet of paper, and is published on the back of the monthly Commander's Message to all hands. The 303 TFS distributes the CSB at the sign-in for their unit training assemblies. Another option would be to distribute using the organizational mail bins.

Major Kenneth Brust, FSO for the 303 TFS, at Richards Gebaur AFB, Missouri, provided this month's FSO's Corner idea.

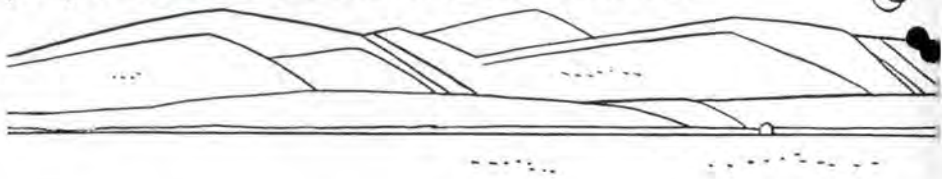
Tell me about your FSO's Corner idea. Call me (Dale Pierce) at AUTOVON 872-2012 (TAWC); or send your name, AUTOVON number, and a brief description of your idea to 919 SOG/SEF, Duke Field, Florida 32542-6005. ■



MAJOR NORMAN L. BOX
Air Advisor
152 FIS
Arizona Air National Guard

TIPS FOR TIGERS

(OR) CARELESSNESS CAN BE COSTLY



■ This was only a short trip. Yet this F-86 driver admits he made six mistakes. We can learn some valuable lessons from his experience even though it occurred over 30 years ago. We can still make some of the same or similar mistakes today.

Reprinted from *Flying Safety* magazine, November 1957.

Another senior pilot and I had attended a meeting at Hamilton Air Force Base, up near 'Frisco. He was from Phoenix, and my home base is Tucson. We were both driving F-86s, and on our return trip, we landed at George for fuel. Since he was going to Phoenix, and I to Tucson, we filed separately but briefed to get some night formation, with me on his wing until we reached Blythe. At that point, I would dogleg to Tucson, and he would go on to Phoenix.

Our birds were clean, and we estimated takeoff at 1805, just at dusk. The engines were started and we taxied out, but we were delayed for about 10 minutes for some landing F-102s.

Takeoff and climb were routine except that I didn't remember the exact time of takeoff, after our delay. *(Mistake number one.)*

I had some trouble maintaining close formation but kept the lead ship in sight, even though the lights on the ground and the bright stars did force strict attention.

I didn't tune in my bird dog because I had confidence in the lead pilot, and I intended to head for Tucson when he made a position report over Blythe. I never heard this position report, so I concentrated on flying formation. I called him once for a reduction in power and immediately caught up. However, he never received this call because his radio had gone out. It was just a coincidence that he reduced power. He also could not make the position report which was to be my cue to head for Tucson. I followed faithfully. *(Mistake number two.)*

The lead was proud of me, thinking that I knew his radio was inoperative and would go via Phoenix and call for him to inform the tower of his muteness.

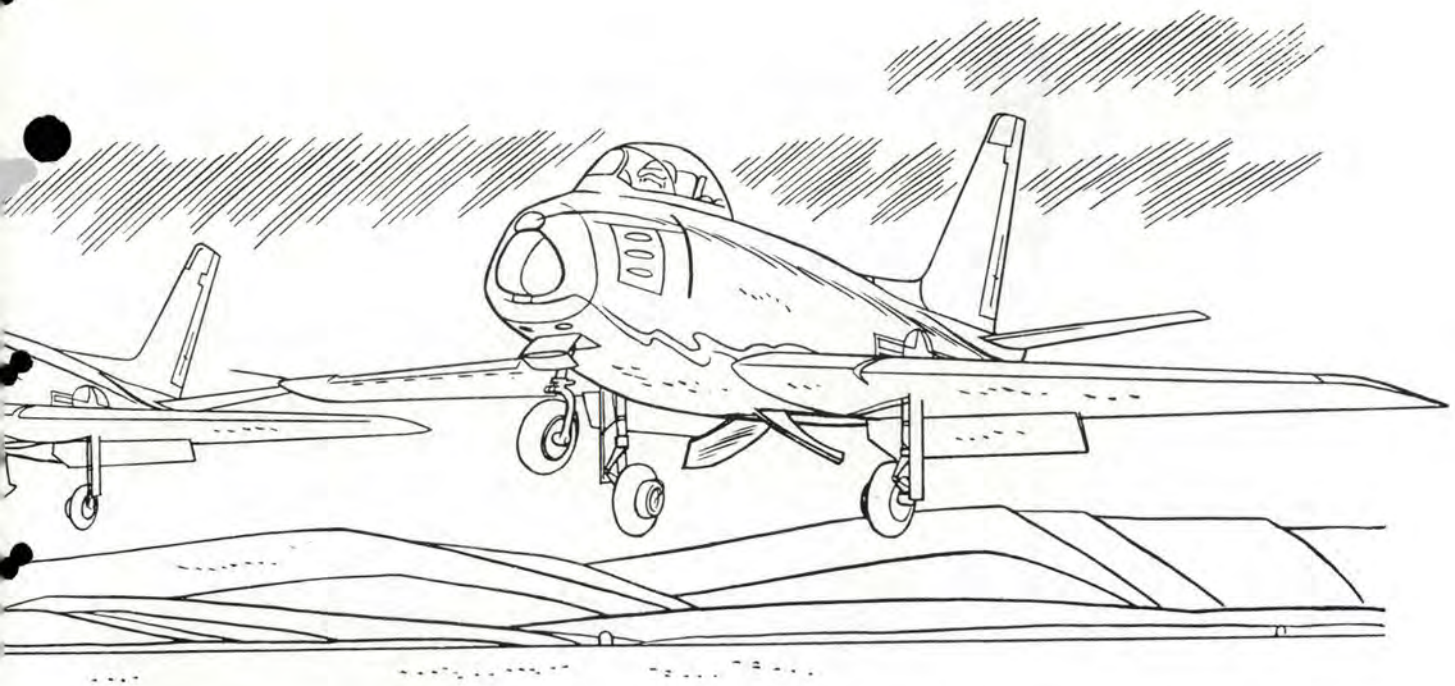
I paid very little attention to the ground, and as I saw city lights approach, thinking it was Blythe, I began my dogleg toward Tucson. *(Mistake number three.)* Instead of Blythe, we were approaching Phoenix. Had I looked, I certainly would have known by size alone.

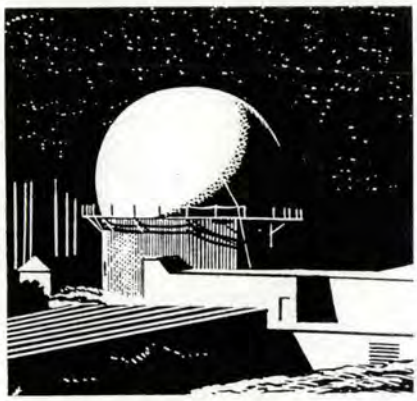
I turned on my bird dog to Tucson and had some trouble seeing the dial. My flashlight, which I had checked the day before, was dead. *(Mistake number four.)* I identified the station. It was about 20 degrees to my right and unstable, which was correct for about 135 nautical miles off. I checked the time. For the next 10 minutes, I admired the darkness and clarity of the Arizona nonrestricted sky at 38,000 feet MSL. *(Mistake number five.)*

Since I should have seen the lights by now but didn't, I retuned my bird dog. It came in clear, and the needle steadied about 120 degrees to my right. I didn't believe it. *(Mistake number six.)* I switched channels and called the nearby radar site to say that I was in the Gila Bend area and wanted a steer to Tucson.

I maintained my heading, squawked and re-squawked on several different modes, and when positive identification was established, they told me that I was 110 nautical miles northeast of Tucson. My fuel showed 85 gallons. I was given information on distance to Winslow. I asked for winds at 38,000, and since they were in my favor toward Tucson with its long runways, I chose Tucson. I wasn't familiar with Winslow anyway. I could hardly believe the headings which they gave me. But I followed their instructions — *the first correct thing I did!*

They kept check on my groundspeed, altitude, and fuel. They were worried as to whether or not I'd make it. But they weren't nearly as





worried as I was by now. I went through my ejection procedure, which came easy. Dark and alone — 80 nautical miles to go, with 60 gallons of JP-4 to go on. It looked real bad. I tried to wean the J-47. I thought of stop cocking, riding the wind and then restarting for landing, but the darkness changed my mind.

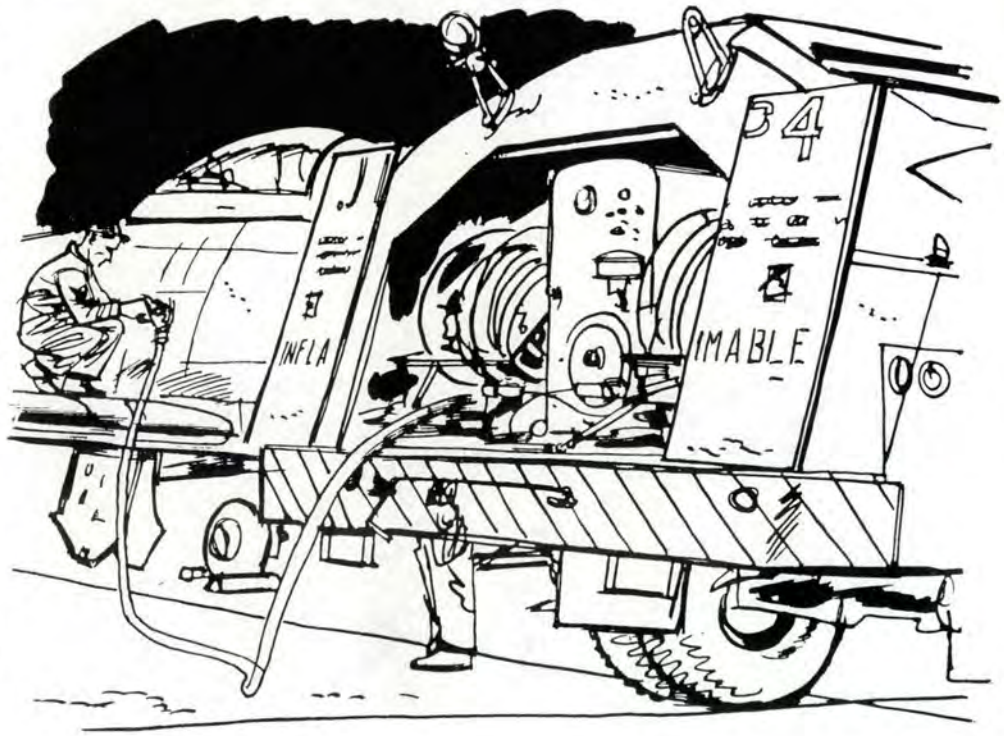
As I could see the distant lights of home, my fuel gauge was nearing the peg. I was at idle and descending. I declared an emergency with the tower which gave me a choice of either direction on the long runway. I knew that I had the field made, but in what direction, I wasn't sure.

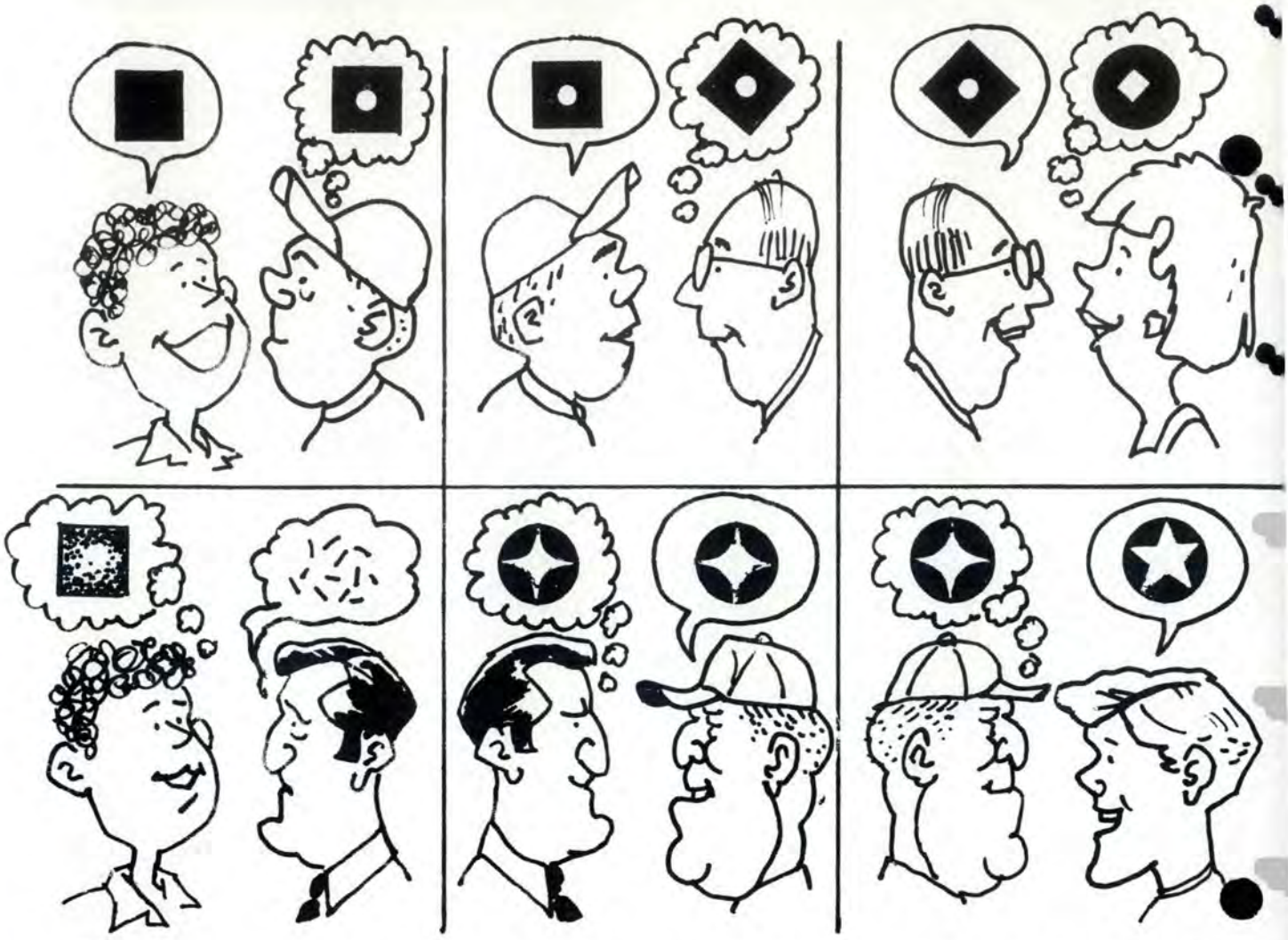
The empty peg was supporting the fuel gauge needle. I was high and had to open speed boards — not recommended below 50 gallons. When they opened, the fuel needle flicked. I thought I had flamed out; however, I still had power. I made a 90-degree turn on final, felt good old terra firma, and completed the landing.

I taxied in and parked. Was sort of nervous, too. In Ops I was informed that Flight Service had inquired about my being overdue about 25 minutes.

After closing my flight plan and rendering a "thanks" to the radar site for the "save," I went home.

In reminiscing, it was easy to see the numerous, so-called "little mistakes" I made that developed like the proverbial snowball into a serious situation. At no time was I lost — I knew I was over Arizona somewhere. When the aircraft was serviced, it took 431 gallons, and holds 435. This is much too close for comfort on a dark night. I do not recommend this type of procedure. Believe me, it's not at all easy on your constitution. ■





Communication: What's It All

Speak and write clearly! In an aviation environment, proper communication is critical to our mission success!

AUGUST W. HARTUNG
Directorate of Aerospace Safety

■ There is the story of the woman who went to a marriage counselor for help concerning her marriage problems. The counselor said he had a few questions and asked the woman to answer them as candidly as possible.

When the woman agreed, he began by asking, "Do you have any GROUNDS?" to which she responded, "Why, yes, we do. We have about 10 acres just north of town."

"No, ma'am," the counselor replied, "that's not what I mean. What I mean is, do you have a GRUDGE?"

"Oh no," she replied, "but we do have a nice little carport."

"No, ma'am," said the counselor, "that's not what I meant. "One more question. Does your husband BEAT YOU UP?"

"Beat me up? Oh no, I get up before he does every morning."

In complete exasperation, the counselor said, "Lady, you're just not listening to me! Why are you having trouble with your husband?"

"Well," she said, "the man just does not know how to communicate with me."

More Than Just Talking

What did he or she say? And so it begins . . . whether it ends in confusion or clarity is up to us — the communicators. The talkers, writers, listeners, and readers are each of us. We make it all happen. But sometimes it doesn't happen the

About?

way we'd like it to. The Challenger disaster reemphasized the absolute need for clear communication between all parties.

Before you think this is another article about the importance of proper crew coordination, it's not. Rather, it's aimed at all of us — the fliers, fixers, controllers, and many other support people associated with making airplanes fly. If nothing else, it should serve as a reminder that communication involves more than just talking or writing. It involves the ability to convey ideas, attitudes, knowledge, and instructions concerning job tasks and safety.

A review of the following mishaps, both potential and actual, best illustrates just how important proper communication, both oral and written, really is.

Slam-Bam After starting both engines, the F-15 pilot noticed low utility hydraulic pressure, both inlet lights on, and both inlet ramps still up. He called for a maintenance "red ball" fix.

Two hydraulic specialists arrived and instructed the pilot to shut down the left (no. 1) engine. The pilot did so, but left the no. 1 inlet ramp cockpit switch in the "Auto" position.

Troubleshooting with the crew chief, the specialists went to door 10L located closest to the variable inlet ramp, and opened it. While one specialist stood to the right, the second one held the hinged-door up with his hand.

Upon seeing the left inlet control circuit breaker popped on, the circuit breaker panel inside area 10L, one specialist immediately pushed it in. (Remember, the no. 1 inlet ramp cockpit switch was still in the "Auto" position.) Guess what happened to the specialists? Right on. They got clobbered by the ramp slamming down and striking the opened door. Though slight, their injuries could have been a lot worse. *Cause: Miscommunication.*

Hungry Falcon After aborting in the prime jet during a local exercise, the F-16 pilot went to a spare. Because of alarm condition radiological black, the crew chief was not immediately available when the pilot arrived at the spare.

The pilot laid his video tape recorder (VTR) tape on the engine intake shelf below the VTR access door and completed his walk-around inspection. A short time later, the crew chief and assistant, both in full chemical gear, arrived as

continued

COMMUNICATION: What's It All About? continued

the pilot was climbing in. Knowing the pilot was in a hurry, they worked as a team to expedite the launch. The pilot was simulating chemical gear by wearing his mask up and visor down.

When the crew chief removed the ladder from the aircraft, he didn't hear the pilot tell him to make sure the VTR tape was installed. The pilot launched and flew his mission uneventfully.

Guess where the VTR tape was? A postflight inspection revealed extensive FOD damage to the engine. *Cause: Miscommunication.*

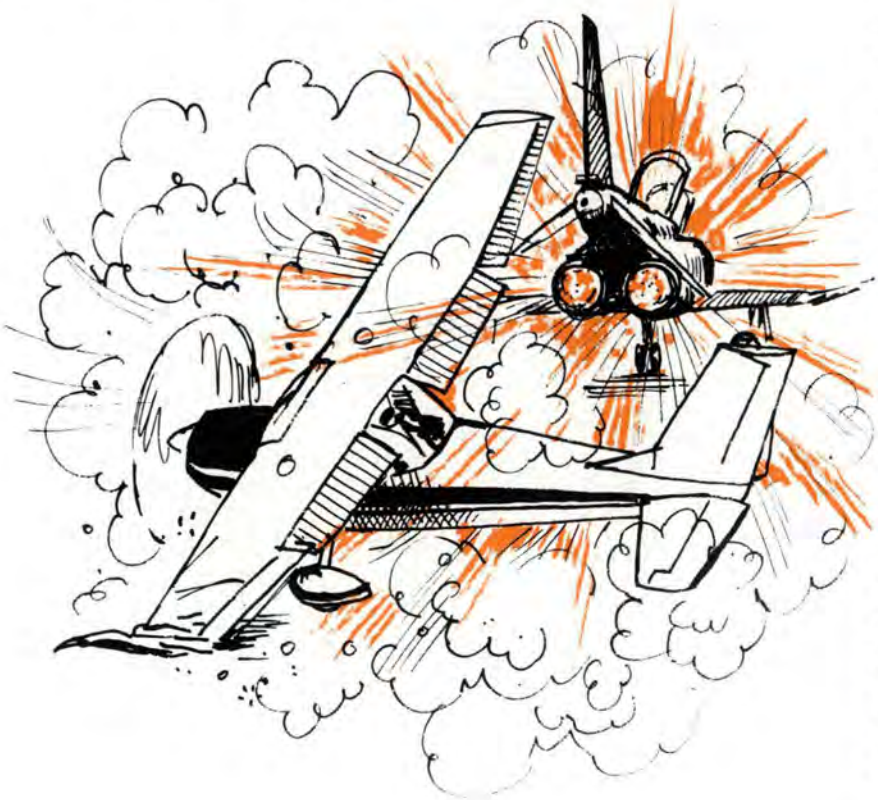
See What? An Aero Club Cessna, flown by a student solo pilot, was on a taxiway some distance from the normal departure end, holding short of an active runway. Meanwhile, the tower had just cleared a military aircraft (that acknowledged the clearance on UHF) for immediate takeoff at the departure end. However, the Cessna pilot simultaneously acknowledged this takeoff clearance on VHF, using an abbreviated call sign similar to that of the military jet.

When the pilot of the military jet started his takeoff roll, guess what he suddenly saw in front of him? Fortunately, the military jet was able to abort, while the Cessna took off, unaware of the conflict. *Cause: Miscommunication.*

Blast Away! The pilot in another Aero Club Cessna was instructed by tower to taxi to the active runway. The Cessna's taxi path via the taxiway took him 150 feet behind the parking spots of some jet fighters.

A maintenance crew was conducting a ground engine run of one of the aircraft without the air traffic control tower's knowledge.

As the Cessna pilot passed behind the fighter with the operating engine, guess what the fighter's exhaust did to the Cessna? Sure, it pushed that little plane to the side, causing it to tip. The left wingtip and propeller contacted the taxiway. Although the aircraft was damaged, there were no injuries. *Cause: Miscommunication.*



Faulty Fuel Pump Maintenance technicians had properly bolted a main fuel pump (MFP), main fuel control (MFC), and a remote fuel trimmer together on an aircraft engine. After a successful test cell run, these same components were inspected during engine preparation for final inspection.

Later, an unidentified individual cannibalized the serviceable trimmer and its mounting bracket, as a unit, from the engine, and partially installed a faulty trimmer unit in its place. Two lock nuts securing the MFP, MFC, and trimmer mounting bracket, along with the associated safety wire, were not installed.

Although the individual did attempt to identify the discrepancies by placing a piece of tape in the area of the components, he did not document a new status on the engine forms or tell anyone.

A final inspector reviewed the engine forms, which suggested the engine was in working order, and began the inspection of the engine. Although never suspecting any discrepancy with the engine, he found the tape, noticed two bolts on the MFP and MFC assembly without their safety wire, and safetied them. What he did not see were two miss-

ing lock nuts on the opposite side of the assembly and engine.

Maintenance people installed the engine in the aircraft, successfully ran it on the trim pad, and released it for flight.

During takeoff, the pilot selected afterburner. With two of its four bolts unsecured, guess what happened to the MPC? It slightly separated from the MFP, allowing fuel to escape into the hot, left engine compartment.

When the fuel ignited and the left engine fire light illuminated, the pilot aborted the takeoff and egressed the aircraft uneventfully. *Cause: Miscommunication.*

What's It All About?

Those are just a sample of the daily mishaps or near mishaps that occur as a result of a breakdown in the communication process. Whether we speak or write, effective communication is vital!

When we communicate, our objective is to cause some form of action on the part of the listener or reader. When we fail to get the action we are after, our communication is flawed, often resulting in inlet ramps slamming down on people, VTR tapes being ingested by engines, near-ground collisions on runways, light aircraft being blown over from jet blast, or incorrect status of engines that were thought to be serviceable.

Don't assume everything will go as planned in the communicative process. If we do, then we can count on the "action" part of our listener or reader to be seriously flawed or left completely to chance.

Remember the words of Edward R. Murrow: "The obscure we see eventually, the completely apparent takes longer." ■

FSOs and FCFs

CAPTAIN BILL RUSK
474 TFW/SEF
Nellis AFB, Nevada

This article is TAC specific. However, those in other MAJCOMs may find these thoughts helpful. Depending on his or her individual qualifications, your flight safety officer (FSO) may be your best choice for a functional check flight (FCF) pilot.

■ The squadron FSO is probably the best person in *your* squadron to have qualified as one of your FCF pilots. He should already meet the experience requirements, have a good knowledge of the aircraft, emergency procedures, and also have a good rapport with the maintenance and quality assurance side of the house. These qualities are essential to the FSO and can be enhanced by participation in the FCF program.

FSO Qualifications

If you have selected your flight safety officer in accordance with current directives, he should have the following attributes (TAC Reg 36-1):

- Possess a record reflecting superior performance and potential for future advancement as squadron operations officer, squadron commander, or chief of safety.
- Be on unconditional flying status with a minimum of 500 hours mission time or 1,000 hours total time and 300 hours mission time, 200 of which must be in UE aircraft.
- Must have a minimum of 18 months retainability on station from date of selection.

FCF Pilot Qualifications

To be selected for the FCF program, the FSO needs to have (TACR 60-1):

- 750 hours total and 200 hours first pilot PAA time, or
- 650 hours total and 300 hours first pilot PAA time, or
- 575 hours total and 400 hours first pilot PAA time.

As you can see, your FSO meets the experience requirements for the FCF program.

Advantages

In addition, your FSO is probably a senior member of the squadron with a strong basic aircraft knowledge and a solid reputation of dependable performance. The time spent reviewing mishap reports has given him an extra body of knowledge to use in emergency situations. Sounds like the right man for the job, huh? It gets better.

While working as an FSO, he has built a good rapport with the maintenance side of the house during investigations. This relationship is probably the most difficult part of the FSO's job. It can be a tenuous relationship, but this can be improved by participation in the FCF program.

As an FCF pilot, he will be working with maintenance to try to get a jet back to the line and in service. This is a positive role which will offset the sometimes negative role of mishap investigation. Doing FCFs will also expose him to more of the maintenance organization including quality assurance, the AMU, and on occasion, the backshops.

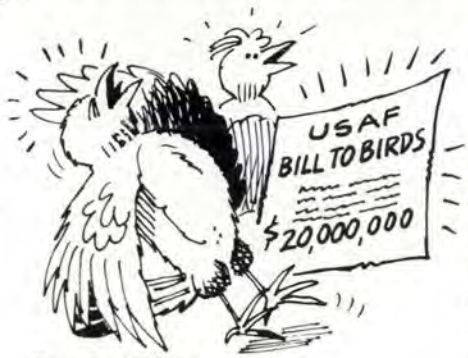
Finally, the FCF program will offer your FSO an opportunity to become more involved in the AFTO 22 process, MDR process, 847s, and possibly, even SOF procedures.

It's a win, win situation. Check out your FSO as a FCF pilot. The FCF program and your flight safety programs will both benefit. ■

876-SAFE

Brig Gen James M. Johnston III has established a new "Safety Hot Line." If you have a safety concern you think the Director of Aerospace Safety should know about, call this AUTOVON number (876-7233) and leave a message. Brig Gen Johnston or a member of his staff will personally review and answer each call.

MAINTENANCE MATTERS



For the Birds

■ Hardly a week passes without a reported in-flight bird strike. But what about on the ground? In recent years, there have been numerous cases of birds being ingested by aircraft during engine maintenance runs. While the results of nonflight bird strikes are normally not as spectacular as in-flight encounters, they can be just as costly.

A KC-135 crew chief performed an operational run on nos. 2 and 3 engines. The run was completed, seemingly without incident. However, during the postrun intake inspection, the crew chief found severe damage to the no. 2 compressor section. When the engine shop removed the N1 compressor section, they found that the engine had ingested a bird. Cost of repairs . . . $17,700.

In another incident, a maintenance team inspected the no. 2 engine of the C-5A prior to running it for an in-flight generator writeup and found no damage. However, after the run, the flight engineer found extensive damage to the no. 2 engine. Further investigation revealed that the engine had ingested a bird which was later determined to be a sandpiper. Cost of repairs . . . $15,160.

These are only two of many incidents where birds have been ingested during engine runs. Each year our feathered friends cost the Air Force thousands of dollars in engine damage. For this reason, it is important to use caution when running engines in areas heavily populated with birds.

Stuck Missiles

After the load crew was dispatched to download a captive AIM 9P missile from the F-16, they encountered difficulty in getting the missile to slide aft. The load crew chief discovered the missile launcher snubbers were not releasing and determined additional pressure was necessary to inch the missile aft. The number 2 man then grabbed an aircraft chock and used it to apply constant pressure on the radome cover on the front of the missile. It worked! The additional pressure caused the launcher snubbers to release, but when the load crew chief removed the missile cover, he found the missile radome and seeker head damaged to the tune of $3,400.

Here's another incident. An AIM 9P umbilical was torn from the missile during a recent downloading operation. During unload of the missile from Station 1 of an F-16, the load crew experienced excessive resistance which they chose to ignore. By forcing the missile, the umbilical roll pin contacted the missile launcher rail, damaging the guidance unit with attached motor and five female pins.

Both of these mishaps could have been prevented if the load crews had halted their operations when undue resistance was encountered and obtained assistance from the armament systems shop people. Sometimes, an extra pair of eyes can assess the situation and provide the technical assistance to get those stuck missiles off their aircraft launchers.

These are only two examples of stuck missiles and the mishap potential involved. They are mentioned here to show it can happen to the best of us. The moral is simple. Armament systems people are assigned for a reason, so use them. Don't depend on undue force to get the job done. Our missiles are far too expensive for anyone to use aircraft chocks for additional pressure.

It Shouldn't Have Happened

In preparation for a 120-day inspection on an OV-10A personnel parachute, the technician placed the chute pack on the worktable, unzipped and opened it, and removed the pilot parachute mechanism. At this time, he should have located the static line cutter assembly, removed the lightweight canvas sheath surrounding it, and carefully installed a mechanical safety pin. The purpose of the safety pin is to prevent inadvertent cartridge firing during handling operations.

The technician in this explosives mishap failed to perform the safing sequence in the previous paragraph. Instead, he proceeded to remove the protective cover from the main parachute and remove the main parachute from the pack. Consequently, during the removal of the main parachute, enough tension was inadvertently placed on the static line to cause the static line cutter cartridge to fire.

Technical data warnings are there to protect people and property from damage or injury and must be complied with at all times. Remember, failure to follow a technical data "warning" is failure to obey an order.

Maintenance tasks that seem routine and repetitious can lull us into a false sense of security. Even with sufficient training and routine supervision, personal integrity is the key. This explosives mishap shouldn't have happened, but it did. ■

OPS TOPICS

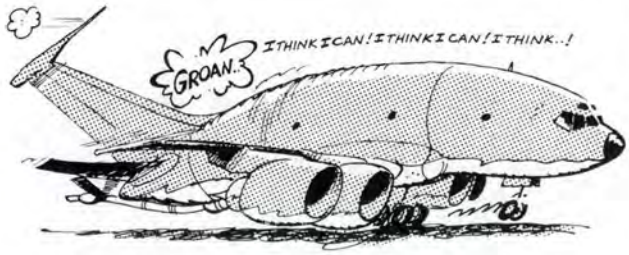
F-15 Flameout

■ While performing a G-awareness turn, the F-15 pilot felt a loss of thrust and saw the left engine RPM decreasing through 25 percent. He tried two spooldown restarts and one JFS-assisted restart without success. He then made an uneventful single-engine recovery.

Back in the chocks, he tried to start the engine at the direction of maintenance and was unsuccessful. The crew chief then asked him to check the fire buttons. The pilot found the left fire button was depressed. He reset the button and the engine started normally.

The fire button was probably inadvertently actuated by the pilot during maneuvering flight. This is possible because of the design and placement of the fire buttons in the F-15, and it has happened before.

The problem is being worked. In the meantime, all you Eagle drivers must be aware of this possibility. If you have a flameout and the engine won't restart, check the fire buttons.

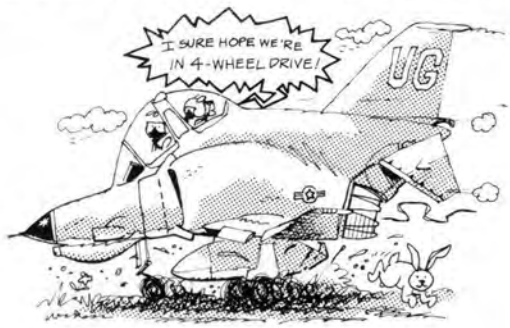


Surprise!

The pilot of a KC-135 set up the proper stabilizer trim for takeoff and began the takeoff roll. During rotation, he had to apply forward pressure on the yoke to prevent overrotation. Throughout the flight, the aircraft was extremely tail heavy. On approach, a check of approach speed versus angle of attack showed the aircraft to be approximately 6,000 to 7,000 pounds heavier than computed.

After landing, the aircraft was defueled for a weight and balance check. It was then maintenance discovered the upper deck fuel tank, which had been inserted 7 years before, was almost full. At the time the tank was deactivated, the sump drains had been capped and the fuel quantity indicators disconnected. In the 2 months since the last major maintenance, fuel entered the tank through a loose fitting in the single point refueling/air refueling manifold.

Other than the abnormal CG, the crew had no indications of the extra 6,000 pounds of fuel.



Unplanned Cross-Country

Two F-4s made a planned formation landing. Everything went as advertised until no. 2's nose gear touched the runway. At this point, the aircraft began to drift toward the edge of the runway (away from lead). The pilot engaged nosewheel steering to correct back to the center of his side of the runway.

Nosewheel steering and normal braking did not seem to be working, so the pilot used full left rudder and left aileron in an attempt to correct back to the left. Again, the flight control corrections were ineffective.

The pilot then pulled the emergency brake handle and applied left brake, but could not prevent the aircraft from departing the runway. The aircraft left the runway 3,500 feet from the approach end and paralleled the runway for another 2,000 feet before coming to a stop.

After shutdown, investigators discovered a broken utility line to the right slat. This depleted the utility system just prior to or during the landing. ■

LESSONS LEARNED

A fictional account . . . sorta

MAJOR DAVID L. SEARCEY
71 FTW/DOOT
Vance AFB, Oklahoma

■ 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 is why I love that old commander. ■

UNITED STATES AIR FORCE

Well Done Award

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

SECOND LIEUTENANT

Brian A. Miller

185th Tactical Fighter Group (ANG)
Sioux Gateway Airport
Sergeant Bluff, Iowa

■ On 7 December 1987, Lieutenant Miller was flying a dissimilar air combat training (DACT) checkout sortie in an A-7D. During his warm-up exercise at 10,000 feet and 420 KIAS in a left turn, the aircraft violently pitched over pulling Lieutenant Miller's hands off the stick. He got his hands back onto the stick and recovered the aircraft at 7,000 feet AGL.

Lieutenant Miller disconnected the automatic flight control system (AFCS) and climbed for altitude. He was now in a 40-degree climb at 400 KIAS when the aircraft pitched over again. As before, the negative Gs pulled his hands from the stick. He recovered the aircraft at 4,500 feet AGL.

Lieutenant Miller then disconnected both pitch and roll trim. After climbing for a few seconds at 5,000 feet and 350 KIAS, the aircraft again pitched over, this time more violently than before. Lieutenant Miller was disoriented by the violence of this maneuver and made the decision to eject; however, due to the extreme negative Gs, he was unable to get his hand on the ejection handle. He was able to reach the stick and "pulled." He again recovered the aircraft, this time 2,000 feet AGL.

The G meter was pegged at -5 Gs. Lieutenant Miller climbed to 17,000 feet, performed a controllability check, and determined he could safely fly the aircraft to a landing, even though the pitch trim was full nose down. Lieutenant Miller recovered the aircraft without further incident. The brief amount of time from the first pitchover until he got the aircraft under control for the third time required him to constantly control the aircraft while being subjected to several involuntary negative Gs.

Lieutenant Miller's coolness, quick thinking, outstanding flying skills, and his ability to analyze the situation saved his life and a valuable USAF aircraft. WELL DONE! ■

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UNITED STATES AIR FORCE

Well Done Award

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

1ST LIEUTENANT
Michael W. Ellicott

1ST LIEUTENANT
Daniel J. Higby

Det 4, 1402d Military Airlift Squadron
Eglin AFB, Florida

■ On 10 February 1988, Lieutenants Higby and Ellicott were flying a C-21A from Hill AFB, Utah, to Andrews AFB, Maryland. During their takeoff, at 50 feet AGL, the no. 2 engine experienced a catastrophic engine failure. The aircraft immediately began a yaw and roll to the right. Lt Ellicott applied nearly full left rudder and aileron while simultaneously advancing power on the no. 1 engine.

After establishing a wings level attitude and a climb, Lt Ellicott accomplished the engine failure on takeoff procedures. Lt Higby declared an emergency and coordinated for a visual turn back to the runway. The crew confirmed which engine it was and retarded it to idle. The aircraft was still shaking violently when the crew elected to shut the no. 2 engine down.

Even with the no. 2 engine shut down, the damaged engine's rotation caused substantial vibration and made it difficult to determine the condition of the no. 1 engine. Lt Higby dumped fuel and ran the necessary engine failure checklists.

Lt Ellicott held speed to a maximum in the final turn so as to make the runway in the event of dual engine failure. Lt Higby terminated fuel dumping on final, while Lt Ellicott configured the aircraft for a flawless heavyweight, high pressure altitude, single-engine landing.

In the C-21, an engine failure on takeoff is considered so inherently dangerous that it is not even practiced, except in the simulator. In this case, the aircraft's proximity to the ground, heavy gross weight, and high pressure altitude, made the maneuver even more difficult. Lt Ellicott's quick reactions and outstanding airmanship, along with Lt Higby's indepth knowledge of emergency procedures and flawless attention to detail, prevented the loss of a valuable Air Force aircraft, crew, and passengers. WELL DONE! ■

Write A Dumb Caption Contest Thing

Knock, Knock! "Who's there?" "Opportunity." Can you beat our dumb captions? If you send us the best one, we'll send you our cheap little prize and also feature your caption in our May magazine. Can you afford to pass up such an opportunity?

Write your captions on a slip of paper and tape it on a photocopy of this page. DO NOT SEND US THE MAGAZINE PAGE. Use "balloon" captions for each person in the photo or use a caption under the entire page. You may also submit your captions on a plain piece of paper. Entries will be judged by a panel of experts on dumb humor on 20 May 1989. All decisions are relatively final. ■

Send your entires to: **"Dumb Caption Contest Thing" • *Flying Safety* Magazine • HQ AFISC/SEPP • Norton AFB CA 92409-7001**