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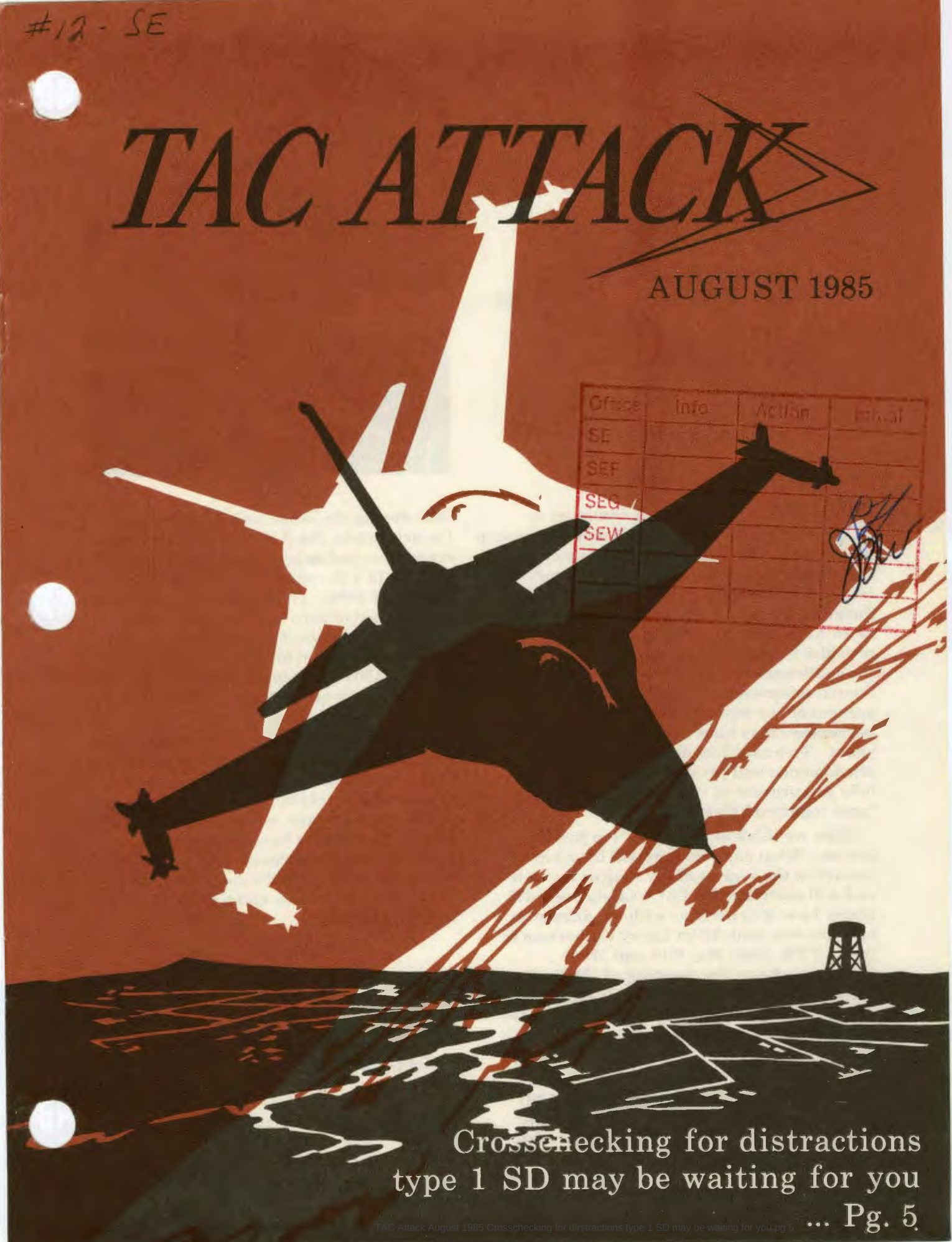
TAC ATTACK

AUGUST 1985



Crosschecking for distractions
type 1 SD may be waiting for you
... Pg. 5

ANGLE OF ATTACK

This month TAC ATTACK continues to provide you with functional tools for mishap prevention. Our feature articles center on spatial *mis*orientation and human factors. We introduce General DeHart, the Command Surgeon, who urges you to think of yourself as an Aerospace Athlete. His analogy provides a concept for preparing yourself for the challenges and demands of aircrew duty. Spatial misorientation has been a factor in 40 percent of our mishaps this year--the percentage may have been higher in past years. Two excellent articles address this phenomenon and provide specifics that will help you prevent or recover from this "unrecognized killer."

Often we think or even say, "I'm just one person. What can I do that will have any impact on the success of my shop or my unit and will contribute to TAC's safety record?" Major Lew Witt helps us with the answer in his interview with MSgt Larry Culbertson of the 31 TTW. Both Maj Witt and MSgt Culbertson know the meaning of "Make It Happen, Make It Better, Make It Last." I encourage you to read this article looking for ways you can apply these principles of success.

We graphically present the lives and aircraft lost by TAC and TAC-gained ANG and AFR units this year. In TAC, we have lost five fewer lives and four fewer aircraft than during the same period last year. Unfortunately, the ANG lost over twice as many lives and nearly three times as many aircraft (8 v 3) compared to the first six months of 1984. The Reserves equalled their 1984 record of zero losses for the same period. Obviously, TAC and TAC-gained Reserve units need to continue their trends and the ANG needs to reverse its trend. We at TAC Safety are prepared to help, but you hold the reins to success.

After nearly two years of directing TAC ATTACK to even higher levels of excellence, Maj Lew Witt leaves his word processor to return to the cockpit. He has successfully edited the magazine, written superb articles, fought the battle of bureaucracy and printing, and transitioned TAC ATTACK from reporting to predicting. Lew, thanks for your great service and Godspeed in your new assignment.

Harold E. Watson

HAROLD E. WATSON, Colonel, USAF
Chief of Safety

TAC ATTACK AUGUST 1985

DEPARTMENT OF THE AIR FORCE

FEATURES

DEPARTMENTS

TACRP 127-1

TAC Attack is not directive in nature. Recommendations are intended to comply with existing directives. Opinions expressed are those of the authors and not necessarily the positions of TAC or USAF. Mishap information does not identify the persons, places or units involved and may not be construed as incriminating under Article 31 of the UCMJ. Photos and artwork are representative and not necessarily of the people or equipment involved.

Contributions are encouraged, as are comments and criticism. We reserve the right to edit all manuscripts for readability and good taste. Write the Editor, *TAC Attack*, HQ TAC/SEP, Langley AFB, VA 23665-5001; or call AUTOVON 432-3658.

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LETTERS

Dear Editor

I have enjoyed *TAC Attack* for years, but I must draw your attention to the F-15 Emergency Situation Training article in the May issue. Either the F-15 has changed in the past year, or there was more wrong with the mishap jet than you let out.

PC1B pressure is routed through the left stab/rudder switching valve during normal operation, while UTL non-RLS fluid is held at the stab selector valve portion of the EG/SSV. What a pilot should see in your scenario would be a Master Caution light, Hydraulic light, PC1A light and then PC1A OFF and PC1B ON. It should end there. When pressure in PC-1 is lost, the SSV will open and put UTL non-RLS fluid to the stab/rudder switching valve. The switching valve will go to a test/fail mode and attempt to build pressure in the return lines downstream to the rudder actuator. If pressure holds, the UTL non-RLS fluid will be sent to the rudder. Since your leak was at the rudder actuator, the switching valve would not be able to build pressure and stay at test/fail. The loss of all UTL in this aircraft should have only happened if: 1) the UTL non-RLS line was leading between the EG/SSV and either stab/rudder switching valves; or 2) the left stab/rudder switching valve itself had failed.

Keep up your normally excellent work.

Sincerely

MSgt Robert A. Phillips
84 FITS/MAA
Castle AFB, California

Dear Sergeant Phillips

According to Maj Keeney (TAC/DOVF), Mr. King (1 TFW/MA) and Mr. Mise (MCAIR tech rep), your description of the hydraulic system's operations is correct for a massive leak. But in the actual situation that this article was based on, a small leak occurred at the left stab actuator. With a small leak, the system may pass both the leak test (two cubic inches/minute) and the return pressure test (250 psi or greater) and will send UTL/non-RLS utility fluid to the actuator, eventually depleting all utility fluid. In other words, a massive leak will fail the test, isolating the problem; a pinhole leak will pass the test and allow utility fluid to enter the system.
ED

Crosschecking for distractions

type 1 SD may be after you

Capt Bob Hesselbein
Chief of Safety, 549 TASTG
Patrick AFB, Florida

It was a dark night when a single-seat

fighter pilot pulled off-target after delivering his final bomb.

The tough part of the mission was over. On downwind he secured his weapon

system switches. Arriving at the base position in the pattern, he quickly crosschecked his instruments, called "Base," turned and accelerated to rejoin on his flight leader. Seconds later his aircraft unexpectedly struck the ground, killing the pilot and destroying the aircraft. What happened?

Another pilot, flying an ACT mission above the gray waters of the Atlantic, observed his target moving across the top of his canopy. As he pulled the nose of his aircraft up toward the bandit's six o'clock, the unexpected sound of accelerating wind across the canopy caught his attention. Accelerating *uphill?* A quick glance at the ADI confirmed he was accelerating straight down toward the water close below. He rolled and pulled toward the ADI horizon, hoping not to hit the water. What happened?

The pilots in these incidents were highly experienced, highly motivated individuals familiar with the design and characteristics of their respective aircraft. I don't believe they were complacent, indifferent or unqualified. Rather, I believe they were good pilots who became victims of Type I SD (spatial disorientation).

Crosschecking for distractions

Sadly, only one survived the encounter.

In his book *Aviation Medicine Physiology and Human Factors,* Dr. X. Y. Dhenin describes two categories of spatial disorientation. He defines Type I SD as phenomena where the pilot is *unaware* his orientation is inaccurate and Type II SD as phenomena where the pilot *is aware* his orientation is inaccurate.

The distinction is important. Type II SD is what most of us have heard about throughout our flying careers. The pilot struggling with Type II SD recognizes a conflict between what his flight instruments are telling him and his seat-of-the-pants sensations. A classic example is the *leans.* It happens to everyone: student pilots, inexperienced and experienced pilots. But Type II SD rarely causes TAC fighter pilots to crash.

Type I SD, however, is causing severe problems for the fighter force. Why? Look again at the definition—the pilot is *unaware* he's in trouble. Why is he unaware? Simply put, Type I SD is insidious. It creeps into the picture when a pilot gets so caught up in the mission that he unconsciously focuses inordinate attention on a cockpit task, a distraction or *anything* that competes with crosschecking flight instruments. The decrease in instrument crosscheck is not due to complacency, but rather due to the impression everything *feels right.* The pilot unconsciously allows flying the aircraft to remain of secondary importance while the immediate distraction is made the primary consideration.

crosschecking for distractions

The decrease in instrument crosscheck is not due to complacency . . .

Many pilots may feel that Type I SD will never happen to them. After all, the phenomena probably never happened to them in the simulator (even though the simulator is often difficult to fly while handling various inflight emergencies). And the simple fact is Type I SD rarely happens to the typical line pilot during simulator sorties; the reason is simple—the simulator doesn't fly like their jet. Pilots are distrustful of the machine. Yes, they're waiting for an emergency to happen, but flying the simulator remains the *primary* task. Type I SD will only happen when the pilot feels comfortable in the cockpit.

Type I SD will only happen when the pilot feels comfortable in the cockpit.

Although Type I SD is insidious, it is not inevitable or unavoidable; we simply need to understand why it happens and how to counter it.

Why it happens

Understanding why requires a brief (I promise) review of how we maintain our equilibrium. We have three different sensory/balancing reference systems—visual, vestibular (inner ear) and somatosensory (sensory endings in the skin, joints, ligaments, etc., which sense gravitational pull). The interaction of these sensory systems combine to give us a *composite perception* of our balance in a one G environment. *It is important to note all three are so well integrated that we are not aware when we transition from one system to another.* We simply do it. For example, when you stand up, you use your eyes (visual system) as your primary source of balance. Sure, your vestibular and somatosensory systems are confirming your balance in space, but your visual system is the primary source of finding where "down" is. Now, close your eyes. You've just tran-

sitioned from visual to vestibular/somatosensory to keep you on your feet. I call this process *sensory transition.* In the same way, highly experienced pilots automatically transition from accurate visual or instrument information (visual cues) to inaccurate seat-of-the-pants cues. It's automatic. It happens comfortably, inadvertently and often fatally. Understanding sensory transition will help you counter Type I SD.

Another consideration is *how* we perform learned tasks. Remember when you were learning to ride a bicycle? Initially the challenge of balancing yourself on that two-wheeled vehicle took all the skill you could muster. But you eventually mastered the task and learned to maneuver with the best of them. As a matter of fact, you became so good at balancing the bike that you *stopped thinking about the balancing process involved.*

The same concept holds true for flying fighters today. Learning to fly jets requires the total effort and attention of the novice pilot to deal with the problems of getting the airplane off the runway, through maneuvers, and back onto the ground in one piece. After many sorties and checkrides, the student pilot progresses to the challenge of learning the intricacies of a specific aircraft mission. In behavioral terms, the process of performing basic flying tasks is no longer primary—it's secondary, and handling the aircraft becomes almost automatic. It's quite important for fighter pilots to develop this skill level—the mission requires it—but we must be aware of the associated risk: Type I SD.

If a pilot becomes *padlocked* to a bandit maneuvering in a horizonless milk bowl, or channelized on the flight lead or a cockpit task, Type I SD can become a potentially fatal reality. The aircraft may be maneu-

Crosschecking for distractions

vering in undetected ways. Studies have revealed roll and pitch rate changes of up to 8 degrees per second before the pilot senses the change in motion using vestibular and somatosensory systems.

How to counter it

So how do we deal with the challenge? First, fighter pilots are going to have to learn to recognize **when and where** Type I SD is likely to occur when you're—

- involved with switch changes
- distracted by other cockpit tasks
- *heading out* of the cockpit without an adequate horizon
- dealing with an inflight emergency.

The flying environment most conducive to Type I SD is—

- marginal/horizonless VMC
- IMC
- night

Then, we need to make ourselves aware of the basic by-product of complex tasking—crosscheck deterioration. Instrument crosschecks decrease when pilots are saturated with other tasks—that's a reality of the fighter mission that we see almost daily. The amazing thing is that the pilot is rarely aware of his decreased instrument crosscheck; he generally feels the rate of instrument crosscheck is unchanged. *Time expansion* (temporal distortions) seems to take place during periods of heavy tasking. To compensate for this reality, we must train ourselves to *increase* the *rate* of instrument crosscheck when cockpit tasking is high and other conditions for Type I SD are present. How much is enough? More frequently than what is natural or comfortable for you.

crosschecking for distractions

We must train ourselves to increase the perceived rate of crosscheck when cockpit tasking is high.

While future cockpit aids, such as the GCAS (ground collision avoidance system), will help alert us to Type I SD, training ourselves to deal with it must begin immediately. And no formal training program exists. So it starts with you. The next time you're flying along and find yourself busier than a one-armed paper hanger, if you feel your crosscheck is sufficient, chances are excellent you're spending too much time between peeks at the instruments. What you don't know may kill you. →

The amazing thing is that the pilot is rarely aware of his decreased instrument crosscheck.

IRCREW OF DISTINCTION

On 29 January 1985, 1ST LT WILLIAM R. ROBERTS was number two of a two-ship of F-15Cs flying a low-altitude intercept mission. During the last planned intercept, as Lieutenant Roberts advanced power, he heard a loud explosion and felt the aircraft shudder. Then he saw a left engine Fire light, a left Bleed Air light and an AMAD (airframe mounted accessory drive) Overheat light. Lieutenant Roberts immediately climbed out of the low-altitude structure while retarding the left throttle to idle. He accomplished the appropriate emergency procedures, shutting off the left throttle and discharging the fire bottle, and headed for the nearest divert field, a municipal airport 25 miles away.

The flight lead, flying chase, reported flames on the top and bottom of the left side of the Eagle. After 3½ minutes, the fire appeared to subside. Then the chase pilot noticed missing and burned-through panels and several holes on the aircraft's side and belly. The left engine Fire light was still on steady.

Lieutenant Roberts spotted the airfield and contacted the tower on Guard channel. As the aircraft neared the field, the Fire light finally went out. Lieutenant Roberts flew a flawless single-engine approach to the short runway that had neither cables nor overruns. After touching down on the first few feet of concrete, he aerobraked to 100 knots, then applied maximum wheel braking. The Lieutenant turned off the runway onto the taxiway where fire trucks were waiting. As he shut down the right engine, the left Fire light came on again. He made an emergency ground egress and ran a safe distance from the aircraft as firefighters battled three- to four-foot flames from the left engine bay.

1st Lt William R. Roberts
94 TFS, 1 TFW
Langley AFB, Virginia

Lieutenant Roberts' quick reactions and outstanding airmanship prevented loss of a valuable fighter aircraft and possible injury to himself. He has earned the Tactical Air Command Aircrew of Distinction Award.

TAC tips

INTEREST ITEMS,

Thor: Alive and well

Collapsed pitot tubes, disintegrated radomes, chunks of wing blown off. We've seen those pictures of aircraft with lightning damage many times, but we may grow a little calloused to the danger that always lurks in the vicinity of thunderstorms.

An Eagle driver felt anew the wrath of Thor as he cruised along during a cross-country. He was in the weather at FL330 following Center's vectors to avoid thunderstorms in the area when he saw a bright flash of light and received a severe jolt inside the cockpit. The left Boost Pump light

came on followed quickly by the PC-1A hydraulic light. When the AMAD Fire light illuminated, he brought the throttles back and realized that the right engine was stuck at 82 percent.

As the F-15 pilot began an en route descent into the nearest recovery base, the AMAD Fire light indicated an overheat and then a fire. His primary ADI failed shortly after that and the fuel quantity gauge wound down. As the pilot safely rolled out from a single-engine landing, tower gave a call that he was on fire. Stopping on the runway, he shut down and stepped over the side.

What happened? Lightning had struck the external centerline fuel tank in five places which subsequently caused it to explode. Shrapnel from the tank caused the resulting problems in the engine, hydraulics and fuel system. The force of the explosion was so strong that it embedded the centerline tank's nose cone in the forward fuselage of the jet. Several other pieces also penetrated along different parts of the underbody. During the approach, heat and fire in the area of the pylon cartridges caused the remaining portions of the tank and the centerline pylon to jettison.

Thunderstorms and lightning still demonstrate unbelievable power that commands our respect. Lightning strikes have caused bomb doors to open, activated wing folding motors, screwed up navigation equipment and caused fuel tanks to explode. And you don't have to be in clouds or precipitation. It can come from "out of the blue" 25 miles from the nearest cloud. The best idea is to stay well away from Thor's hammer.

Which way is up?

We all know not to fly when our ears and sinuses are plugged up from a cold, flu or sinus problems. When sickness does catch us, we're always anxious to get off DNIF and back in the air as soon as possible. But before we do, we need to make sure we're just as airworthy as our jet.

One aircrew member ran into some unexpected physical problems when he thought everything was in fine running order. The F-15 pilot had been off DNIF status from a cold for seven days and didn't notice any further aches or pains. During a formation climbout, he noticed pressure building up in his ears as the flight passed 4,000 feet. One ear cleared itself, but the other wouldn't even when he tried to valsalva.

The real problem came as he looked over at his leader and suddenly had the sensation of rolling right and pushing over. Realizing his disorientation, the pilot got on the gauges and tried to regain his bearings. The feeling of disorientation continued until he passed 7,000 feet and the ear block finally cleared.

The F-15 driver had fallen victim to vertigo caused by the pressure in his blocked ear. Ear blocks are not only uncomfortable, but they can get us into insidious "attitude" problems. Be aware of your physical condition and knock it off if you're not 100 percent. If you get as far as wheels-in-the-well, stop your climb as soon as possible if you can't relieve ear pressure.

In the barrier, but...

An A-7D pilot showed quick thinking when a barrier engagement didn't go quite as planned on the first try. He'd been flying a low-level route when his generator gave out before the flight was finished. Returning to base, he accomplished all necessary emergency actions and set up to take the barrier as recommended. He landed 500–600 feet short of the cable with the hook down and nose gear extended, but the hook apparently hit a support block on the cable and did not engage.

TAC tips

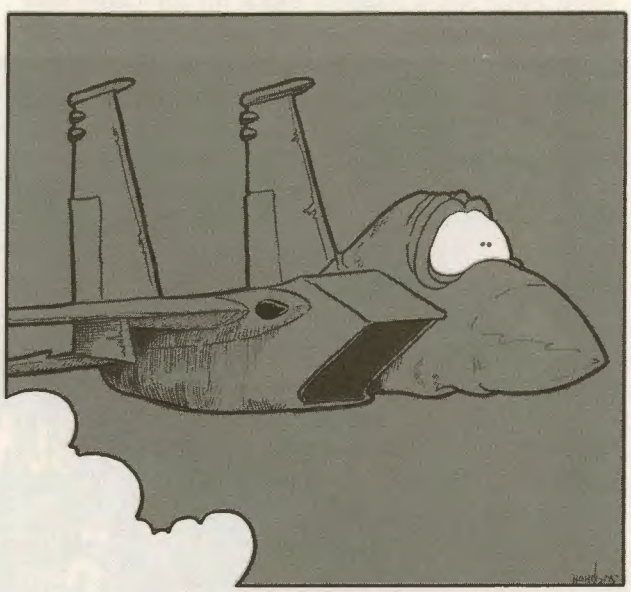
The Corsair II driver initiated an immediate go-around and set up for another try while the ground crew gave the cable a quick once-over. The second attempt went just as advertised.

Flexibility is essential in everything we do. Being too committed to just one plan may get us in trouble when it's obvious that things have gone awry. We've always got to be ready to go to a Plan Bravo, Charlie and so forth that were well thought through before the mission ever began. This guy was ready. Are you?

Nite-
It can happen. Ready?

Double generator failure — it never happens, right? Certainly not at the most inopportune time — at night in the weather. Wrong. It can and has happened. Are you ready for it?

An Eagle was midway through a night PAR and had just broken out of the weather when *all* of the lights in the cockpit went out. Both gene-



rators had kicked off the line and the emergency generator cycled in, but the pilot didn't have the floodlights or utility light turned on. Things grew a bit terse while nearly 20 seconds passed as he tried to find and cycle the generator switches. Finally, one generator did agree to come back to work; and the approach was concluded safely.

What if it had been you? Can you find those few critical switches that are vital in resetting your electrics during total darkness? Try it sometime when you least expect it during your next sim and see how you fare. Maybe you'll decide to turn your utility and/or floodlights on very dim during your preflight — at least enough to help you find the switches if everything else goes black on a PAR. Make sure your flashlight is where you can readily find it if all else fails. That's called preparing to cope with the unexpected.

Glass attack

Sleek and racy F-16 sits number one for takeoff, holding short of the active runway. It may be 108 degrees on the ramp, but this smug looking pilot doesn't care; why he's almost flaunting his comfort, taxiing around like that with his canopy closed.

Enter one hot and bothered A-7 (or F-4, or AT-38, etc.) jock on his third sortie of a surge, in the ninth hour of what feels like a very long day. See this pilot taxi up a couple of hundred feet behind the Falcon. Sweat, sweat, suck a little oxygen.

Now watch tower clear both aircraft across the runway. See the A-7 taxi behind the F-16. See the A-7's canopy depart the aircraft as the F-16 adds power to depart the number one position.

It's another busy season. We're stacking airplanes at both ends of the runway. All that congestion can lead to more blowhard stories like this unless we learn to anticipate. What's the other guy's jet gonna do to my beast? And what's my blast gonna do to the joker with his lid open at my six?

EMERGENCY SITUATION TRAINING

Lt Col Luke Lowery
HQ TAC/DOV

SITUATION: You are number two in a trail departure; current weather is 500 and 2 with tops at 16,000 feet. As you raise the gear and enter the clouds, you notice a Master Caution light and a corresponding CADC light on in the caution panel. Not a real serious problem but one that has the potential to become unforgiving. What'cha gonna do now, Ace?

OPTIONS: A. Reach down to the left side and move the Servo Elec Reset switch to Elec to reset the malfunction.

B. Refer to your checklist since you are not sure if you should reset the malfunction while IMC.

C. Turn on the autopilot while you refer to your checklist.

D. Disregard the light for now. Concentrate on good instrument flying and get some altitude between your bod and the ground.

DISCUSSION: Option A may fix the problem. However, diverted attention while in the weather and/or at low altitude can very easily lead to permanent kill-removal. Option B might also be the right answer under a different set of circumstances; unless the situation is time-critical, using the checklist may keep you from making a dumb mistake. Option C can also be an aid at some other time. How do you preset your autopilot? Alt Hold wouldn't be a player for two reasons: you really don't want to level off at low altitude while still in the murk, and Alt Hold uses CADC inputs to maintain level flight. Option D must be the answer since this is an AF test, right? In this situation, it *is* the right answer; the malfunction presented is no big deal — wasn't meant to be. Just some food for thought for you to review your own personal reactions, habit patterns and recognition of priorities.

TAC has lost too many good people in the past few months. Some lost SA, others were inattentive to the primary job of flying the jet. I honestly believe that the majority of our "instrument-related" mishaps were not caused by a lack of instrument flying ability, but rather the inability to recognize *when* to fly the gauges. **MAINTAIN AIRCRAFT CONTROL** has always been the number one priority — other tasks fall somewhere lower on the list.

Adios My Friends

Making

Fifty-percent failure rate, 48 discrepancies and 14½ workdays per aircraft. Those numbs were the cost of doing business whenever one of the 31 TTW F-4s rolled into the big hangar at Homestead AFB, Florida, for a 600-hour phase inspection. Time wasn't the only problem — aircraft reliability was suspect. So most of the aircraft that completed major phase inspections were flown on functional check flights (FCFs) which increased the workload and took more time. But that was 1981. Today, the 31 EMS phase dock completes the work in ten days and QA (Quality Assurance) finds an average of only two write-ups per aircraft; many birds are discrepancy-free. And

it better

confidence in the product is so high that most Homestead aircraft are not FCF'd when they complete a major phase inspection.

How did the unit make such a dramatic turnaround? Can similar increases in productivity and aircraft reliability be matched elsewhere? We asked **MSgt Larry Culbertson,** a senior supervisor at Homestead's phase dock.

The job

The Air Force learned, many years before you and I came in, that keeping its airplanes ready requires both scheduled and unscheduled maintenance. Unscheduled maintenance is what you do between flights; the aircraft lands and you do some minor or semimajor maintenance before the bird can fly again. We do scheduled maintenance in the hangar. Scheduled maintenance takes care of the major things that we know from experience are due to break — and replaces them before they fail. If you do scheduled maintenance effectively, flying is interrupted less often by failures of major time-change items.

Phase inspections are done at regular intervals, after each 100 hours of flying time. The two major inspections are the 300-hour and 600-hour. Our goal is to get the aircraft out of the hangar on time while maintaining the highest quality work.

Divide and conquer

U.S. Air Force photos by A1C Marvin Krause

There are three squadrons of aircraft here. Each one requires scheduled maintenance every 100 hours. That's a tremendous workload. To meet the challenge, each phase dock is dedicated to a particular AMU and color-coded red, green, blue — the AMU's colors. By marrying the dock to the AMU, the flight line doesn't lose sight that the aircraft is still an important part of their operation. We're a separate squadron, but we're not in a separate Air Force. I've been at a lot of bases where, when the airplane goes into the dock, the flight line has a tendency to forget that problem — it's in for maintenance and will not come back to the line for a couple of weeks. Here, we work together as a team. We have a common mission — getting these F-4s phased and back out on the flight line so they can fly and support the wing's mission.

There's no cross-docking — if it's a green tail aircraft, it's phased in the green dock. One of the long-range benefits of that plan is that the same crew that works on the airplane this month will see it again during its next scheduled inspection three months from now. That's when they reap the rewards of doing quality maintenance because they won't have things that they have blown off for someone else to do later. Look at human nature: if I'm in red dock and I have to fix a green jet that I'm probably not going to see again, maybe I'm not going to be quite as critical.

Here, we also bring the dedi-

Making it better

cated crew chief in with the aircraft to give him x-number of days to do unscheduled maintenance or cosmetic repairs that have piled up. That gives him a sense of pride and responsibility and allows the dock to relate to the crew chief and vice versa. The crew chief comes to work with us and goes home with us. He makes our roll calls and acts as assistant dock chief with an inherent interest in that airplane. Besides dedicated crew chief involvement, we have several specialists assigned who cover the areas on the aircraft that historically give us a problem — hydraulics, sheet metal, environmental and engines.

Motivating for excellence

There's no secret to what we did here — we put the people in here that had the right attitude. I worked for a man when I first got here who had a favorite saying that I put on a plaque on the wall: *Don't tell me it can't be done; help me do it.* That's the right attitude.

I believe that if you give people a good place to work and live, you're going to get good maintenance in return. Today's aircraft mechanic is a professional who basically wants to do good. To encourage him to give his best, we have made a firm commitment to meet his needs because meeting the workers' needs is what makes or breaks any organization — that's no secret.

We made the decision to provide quality equipment and a working environment that's commensurate with his position. We spent some money. We bought quality tools. We upgraded our facilities — mostly by self-help — everything from paneling walls to recovering furniture to building computer desks to building what many consider the finest break room in TAC. Now our facility reflects pride in the outfit.

Another need is recognition. We have a responsibility to recognize our people who deliver what we ask for — quality and timely performance. We do that here by saying, "OK, you deliver an aircraft with no QA write-ups and we'll reward you with a day off." And we do that — sometimes it's tense, but we've made a commitment.

We also engrave plaques on our "board of excellence" with the tail numbers of our aircraft that have zero-defects for all the workers to see. Each dock box has one. We're not talking about a quirk — if you track the dates on these plaques, you'll find it runs a smooth line; and you'll see several of the same tail numbers repeating their zero-defect performance. Excellence is not an accident, it's a result of pride — pro-

making it better

fessionalism applied daily.

The people I work with in this hangar are undoubtedly the best mechanics I have ever worked with because of the pride aspect. You can teach ability, but they've got to have a sense of pride before the ability will surface.

Goals

From the lowest to the highest in rank, if the people who work for you don't understand the goals, they're never going to achieve them; then the wing's never going to achieve its goals, TAC's not going to, etc. We hang charts with our goals out where the people see them everyday and we brief the goals to every newcomer. The average mechanic understands the goals and knows why he's pushing for that goal. Our people know that our goals are both realistic and achievable.

Feedback

Our people also need to be kept informed of their progress. One way we do that is with our progress charts. We track each dock's success rate on passing their QVIs (quality verification inspections) done by QA at the completion of phase. Each dock is color-coded on this chart. Red dock in March 1985 had two 600-hour inspections and passed two with a pass rate of 100 percent. And each month this is tracked so each dock member can see exactly where his dock is. One of the charts plots QVI pass rate with the number of discrepancies per aircraft. When a large number of your aircraft are passing inspection and are getting few write-ups, you are achieving quality and quantity at the same time. By plotting these two goals together, we can show our workers that they've done just that.

Listening

Another thing is listening to your people. What are they griping about? If you let the people that do the work have an input on how they can make their job easier, it will help the whole operation. We have quality circles where members of the work center talk to supervisors about the way things are going, or should go. Then management acts on that. We found our dock members were spending a lot of time going into the support section getting tools, safety wire or whatever they needed to do the job. So we built CTKs (consolidated tool kits) containing all the tools they needed and located them in the dock. The CTKs are on wheels for accessibility, and each drawer is lockable. We give each person a key to his own drawer. Besides making the job easier for our people, we have eliminated the tool control problems we had prior to 1982. We also have a drawer in the CTK for the crew chief who comes in with the aircraft so the AMU doesn't have to worry about saddling him with a tool box up here.

Our dock supervisors used to work out of little lean-tos set up in the middle of this big hangar. It was noisy and hot. So we gave them a place to come in out of the heat and noise. We went through local purchase and got four dock boxes, had them put up, air conditioned them, installed phones and brought in desks and chairs. Now, it's better.

Coordination

We have a predock meeting where people from the AMU, the scheduler and the dock chief sit down and discuss the upcoming inspection, what's going to be accomplished, by who and when. We make a concerted effort to put the right people in the right jobs. There are no bad people in the Air Force, just some people doing the wrong job. Everybody here is after the same thing — it's just a matter of finding out *how* we are going to get to that same objective together.

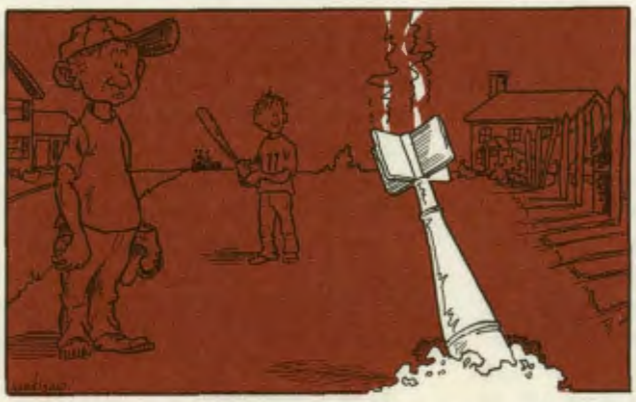
Is it working?

Back when we weren't doing things very smart, we had to FCF every aircraft that came out of major phase. Now, first-flight reliability is an accepted thing. Our QVI pass rate is the highest of any F-4 base in TAC. AMUs schedule them for a mission effective sortie the first flight out of phase. They have that kind of faith in the program.

WEAPONS WORDS

What's plan B

The range work went as planned except one of the A-7's practice bombs didn't release. The pilot chose a route home that avoided populated areas. He planned to recover on the runway designated by the unit for hung ordnance. Unfortunately, a thunderstorm was parked on final approach to that runway, so the pilot flew to the reciprocal runway. The flight path to the other end of the runway is over more populated territory. About four miles from landing, the BDU-33 practice bomb quit hanging around.



It may have been an act of God, luck, or the zoning commissioner's good work, but the bomb hit in a vacant lot causing no damage or injuries.

By the way, there was nothing wrong with the bomb rack. The weapons folks' best guess was that the impulse cartridge (CCU-44/B) did not generate sufficient pressure to completely open the bomb-rack hook.

Hung bombs are probably going to continue to be a problem for this or any number of reasons. The point is, What's *your* plan? Was it developed before the new shopping mall was built off the end of the runway, or is it still current? And when Plan A isn't going to work, does your unit have a Plan B? If you only have one runway, Plan B may mean dragging a hung bomb elsewhere to land.

Masked man

The base is under alarm black, everybody's in their chemical defense gear. The war is heating up. The frag order has changed and it's time to reload several airplanes for another sortie. We've all been there before. There's no question that a routine job takes on a new and unique twist when you're working under chemical warfare conditions.

Two bomb handlers in full CW (chemical warfare) gear rediscovered the need for communication under such conditions. One was using a "bobtail" to back an MHU-110 trailer into a building while his partner spotted for him. The driver's vision was hampered by his gas mask, but he continued to back up even though he didn't know where he was going. The spotter tried to shout a warning but couldn't make himself heard through his mask. The trailer hit a pallet of rocket motors and damaged several of them.

Knowing that we're going to work in CW gear time and again during exercises (perhaps for real), we've got to practice first during less intense conditions. Make the most of each exercise and do as many of your normal job tasks as possible under those conditions. We all know you

can't be heard much beyond your *nose* with a gas mask on. *Visual* signals become critical and we need to make sure that we can be seen so we can be understood. Know the limitations that you personally have when living and working in CW conditions. Chemical defense situations won't go away in the future, and we need to learn to live and work *effectively* now before we have to do it for real.

Right place, wrong time

Ammunitions storage crew was unloading a trailer full of MK-20 Rockeyes. The tarp had been folded back, the banding cut and the job was going well. Midway through, as the forklift was moved into position to pick up another stack, the banding from the *adjacent* stack caught between one tine of the forklift and the container stack being moved. As the forklift driver reversed, the adjacent stack was pulled along and eventually fell off the trailer. The crew's spotter saw what was happening but was unable to stop the forklift operator before it was too late. He wasn't in the right spot *to see* and be seen. As a *result*, several MK-20s and storage containers were badly damaged.

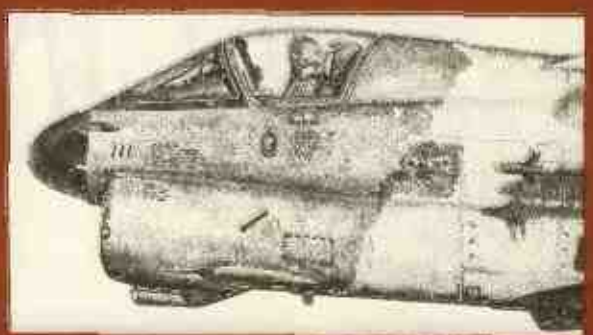
Being a spotter for any task around the flight line or base support areas may not be the most glamorous job, but it is one of the most important parts of doing the job right. Working and driving around *aircraft*, AGE (aerospace ground equipment), munitions and other vehicles can be difficult because of restrictions to our visibility. The spotter can, with just one word or a single gesture, keep us from making a wrong or unsafe move. They might be the only *person* at the right place and *the right* time to keep us from that one wrong move that results in damage or physical injury. Use that second set of eyes to keep yourself from getting into an embarrassing or dangerous spot.

HEADS UP

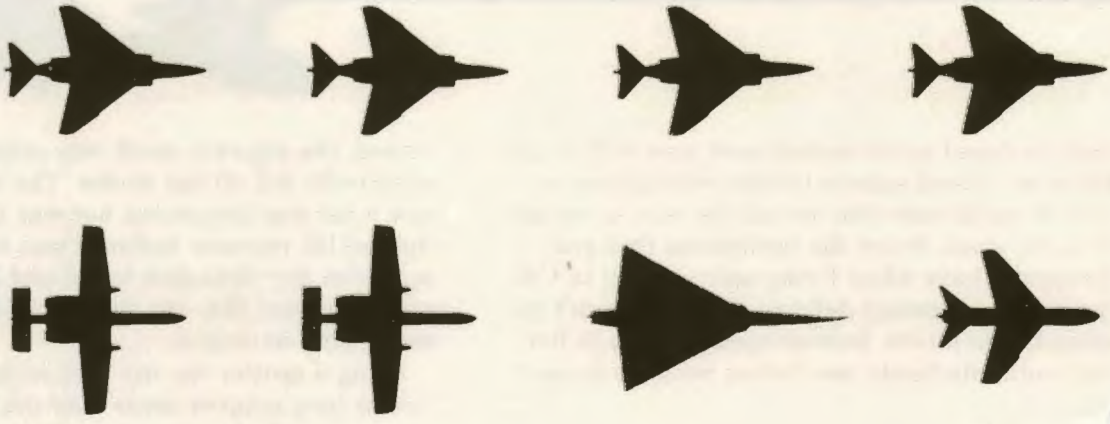
Next month in the

September

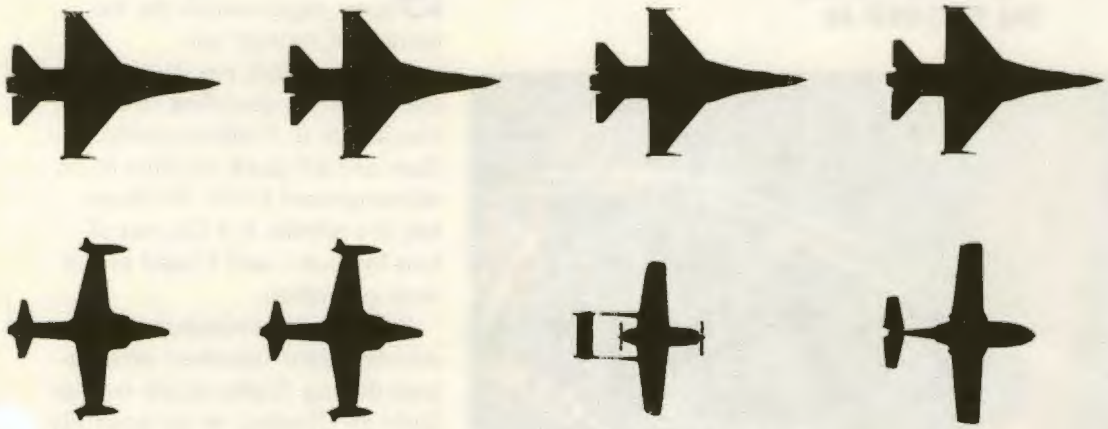
issue of *TAC ATTACK* you can look forward to seeing *A1C Kelvin Taylor's* stipple rendition of the *A-7D* Corsair II IN THE CENTER.

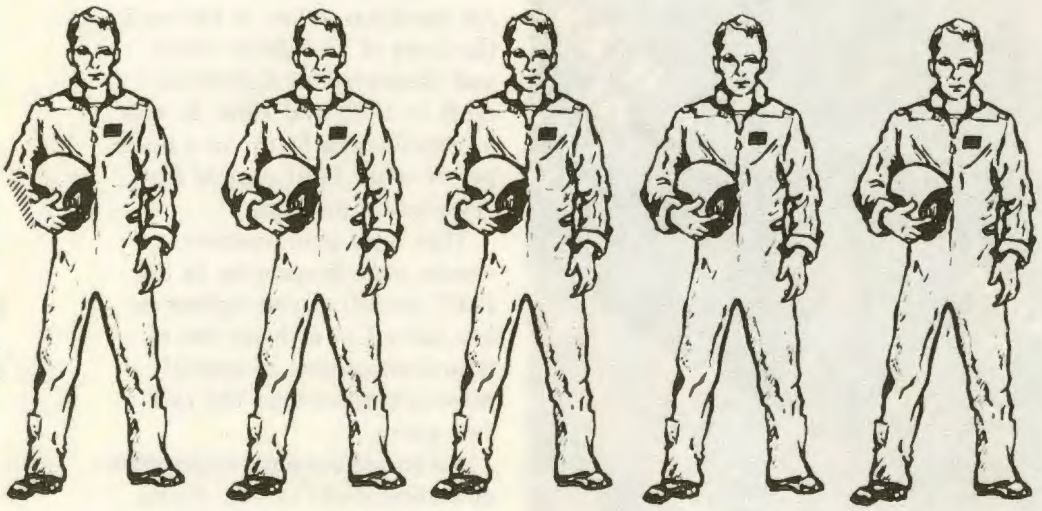


OUR TAC AND TAC-GAINED JANUARY-JUNE 1985



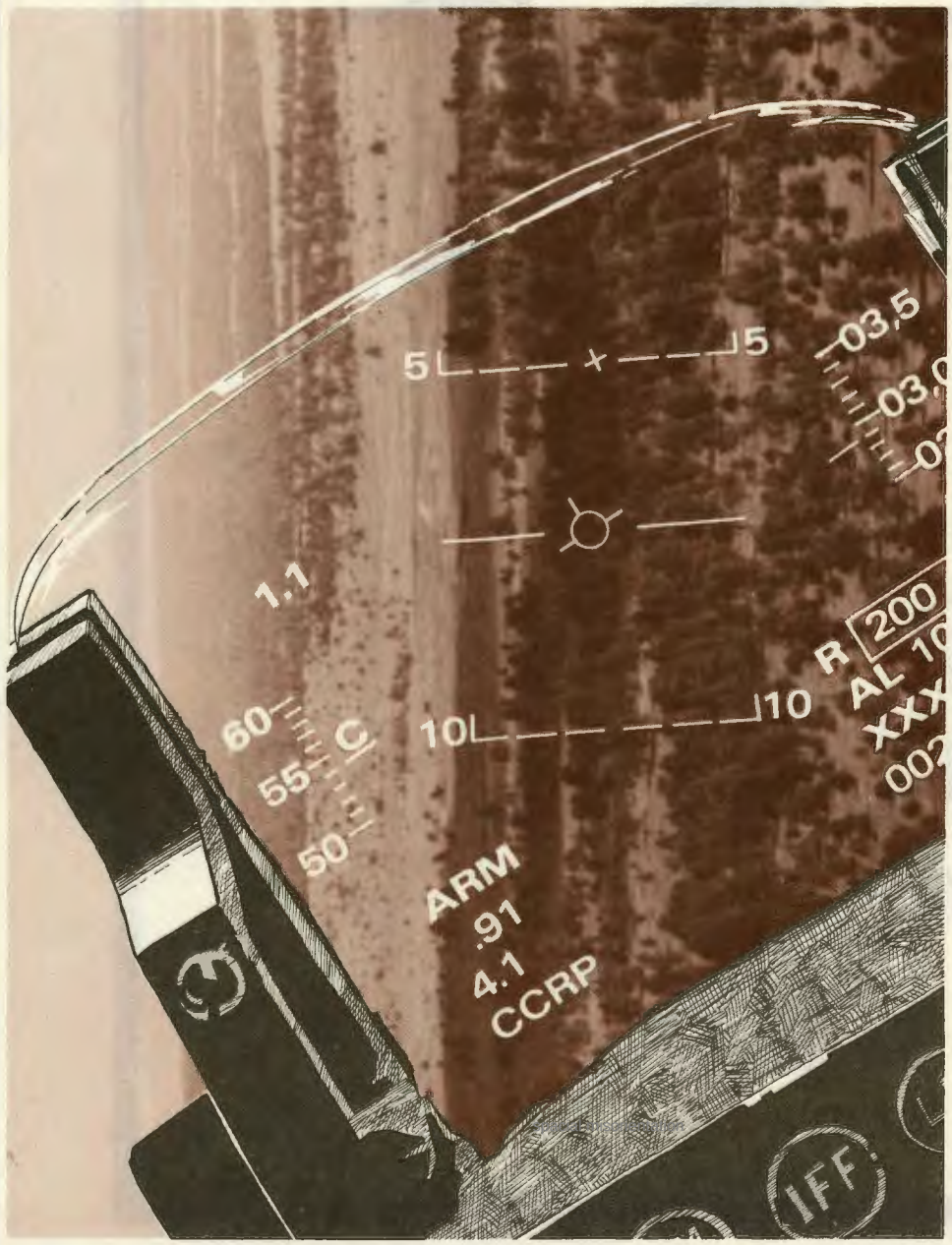
UNITS' LOSSES IN THE AIR





SPATIAL MISORIENTATION

Major Mike Lichty
HQ TAC/SEF-16



Several TAC crewmembers have experienced the extremes of spatial misorientation and, resultantly, are the most qualified to tell you about it. Unfortunately, they are all dead; victims of an unrecognized killer. Perhaps not too subtle, but I'm out of two-by-fours, and I need to get your attention.

Spatial *mis*orientation is an *unrecognized* incorrect orientation during flight which results from an illusion, or an anomaly of attention or motivation. Unlike the classic spatial disorientation you hear about in physiological training or instrument school, spatial *mis*orientation is not associated with discomfort or confusion. An insidious killer, it claimed the lives of 15 fighter pilots and destroyed 12 fighter aircraft in 1983 and 1984. It was a contributing factor in a number of other fatal spatial disorientation mishaps.

This fatal phenomenon occurs most frequently in the F-16, but all of you fighter pilots have lost at least one of your compatriots to spatial misorientation over the last two years.

No one is exempt, regardless of aeronautical rating, flying experience or job title. Spatial misorientation has claimed the lives of at least one squadron commander and three stan eval flight examiners. Flight experi-

AN UNRECOGNIZED KILLER

ence ranged from a recent UPT graduate to a command pilot. Experience in the F-16, specifically, was either between 50–200 hours or 400–500 hours.

Before going further, let's look at the conflict between the two ways our eyes process information. That is part of what sets us up for spatial misorientation. The focal mode identifies objects, is exclusively visual, and involves conscious attention. The ambient mode is concerned more with the quality of our visual surroundings. It is uncritical and easily deceived, the result of a preconscious level of awareness keeping track of and closely interrelated with other sensory inputs.

- tactile (touch)
- kinesthetic (sensation of movement in muscles, tendons and joints)
- auditory (hearing)

Together, they provide the means for ambient orientation.

The ambient mode operates at more of a reflex level, and the part of the brain controlling the ambient mode seems to contain receptors that are most responsive to lines and edges. Recent research has shown that peripheral vision, which contributes to ambient orientation, provides nine times as much balance information as central vision. Since the human body can't long tolerate a sense of disorientation, the ambient mode will very readily lead us to accept uncritically any line which would appear to be a valid horizon.

Knowing this, it is easy to see, yet difficult to comprehend, how two highly experienced fighter pilots *flew* their F-16s into the ground in night VMC. False or misleading ambient airspeed and attitude cues in combination with false horizon cues allowed the pilot's attention to be diverted from a normal instrument crosscheck in order to accomplish a lesser mission task. The lesson learned? To overcome false or misleading ambient orientation cues, the pilot must insure that a *timely* reference to attitude instruments is part of his normal cockpit routine. How frequent is dependent upon how close you are to the ground.

The lack of auditory and tactile cues, or the presence of false and misleading ambient cues, presents a similar hazard in weather. Two F-16 pilots failed to detect a change in pitch or roll during IMC departures. Each aircraft's flight path resulted in an attitude from which ejection or recovery was impossible. One pilot placed a radar trail departure ahead of flying good instruments. The other determined radio calls, navigation tasks, and an Oxygen Pressure Low caution light were more important than a timely instrument crosscheck. Once again we see a deficiency in knowing when to transition to instruments and how frequently they need to be referenced. A simple distraction may consume an excessive amount of a pilot's time if he lacks good habit patterns for monitoring the flight path vector of the aircraft. In some cases, pilots have gone as much as 45 seconds to a minute without monitoring the aircraft's attitude. In every case, the result was an empty helmet peg in squadron life support.

Problems with spatial misorientation can also occur in day VMC where a misdirection of attention is most likely the culprit. One pilot spent an excessive amount of time with his eyes inside the cockpit correcting a low-level chart error. Failing to notice a change in aircraft heading, the pilot's last-ditch effort to avoid obvious vertical terrain was unsuccessful. Another pilot flying low-altitude intercepts was distracted by targets of opportunity. Ambient orientation cues presented by a river valley likely gave the impression of safe terrain clearance. Unfortunately, that was not the case. Had he been checking twelve, he would have seen buildings directly in line with his flight path.

The heart of the issue is that all of these fatal crashes were

SPATIAL MISORIENTATION

preventable. Timely visual or instrument references used to establish or monitor the aircraft's flight path vector would have overruled erroneous ambient orientation cues. So why didn't they?

For the squadron commander and stan eval flight examiners, the scenario suggests a false sense of well-being. When the hair on the back of their necks should have been standing on end, they were too comfortable. For those pilots with less than 200 hours in the airplane, it appears to have been a matter of proficiency and task saturation. It's never been a matter of not being able to fly instruments, just a failure to recognize the need. We need to establish habit patterns that will take over during critical situations, help us to maintain aircraft control and prevent us from becoming victims of our ambient environment. Above all, when these habit patterns are disrupted, pilots must become critical of task prioritization. A pilot in control of his aircraft doesn't unintentionally land gear up, flameout as a result of fuel starvation or die as a result of an undetected change in aircraft attitude.

As supervisors, we need to insure that pilots stay proficient at critical mission tasks such as IMC radar trail departures. We need to emphasize that a trail departure can be flown without a radar lock-on, and that a good instrument crosscheck takes precedence over radar acquisition. At every opportunity, training flights and simulators should evaluate a pilot's ability to maintain aircraft control while analyzing a serious EP or accomplishing a complex mission task in all kinds of weather conditions. For those of you approaching 400–500 hours in the aircraft, a recurring, critical self-evaluation of your performance and personal attitude will enhance your ability to cope with your ambient environment. Above all, each of us needs to admit that *we can* fall victim to false ambient cues if we become careless or task saturated. Analyze the mishaps for yourself, become familiar with the circumstances and realize that the pilots were in fact quite capable. Unlike you, however, they may not have been aware or respected the hazards projected by their ambient environment.

Forewarned is forearmed. As the level of cockpit tasking increases, so should the frequency of crosschecking accurate attitude references. If you're too comfortable, double the rate of your instrument or visual crosscheck. It won't hurt to find you are exactly where you thought you were. It might hurt a lot if you aren't and don't.

TAC LOSSES ON THE GROUND JAN-JUN 85

OFF-DUTY MISHAPS

Motorcycles 

Automobiles 

Pedestrian 

Drownings 

Hiking 

Dune buggy 

Carbon monoxide poisoning 

ON-DUTY MISHAPS

Industrial 

CHOCK TALK

INCIDENTS AND

The eyes had it

An EF-111 pilot was leading another Aardvark in formation back to base for landing when all of a sudden he no longer saw the light. In fact, he no longer saw anything.

Just before the aircraft entered the clouds during the descent portion of an instrument procedure, the air conditioner began blowing full blast and pelted the pilot and electronic warfare officer (EWO) with orange colored foam particles. Although both crew members were wearing their oxygen masks and had their visors down, some of the material (about the size of sand particles) found its way into the pilot's eyes. It caused such irritation that he couldn't open his eyes.

It was about a full minute before the pilot was able to see again. A single-seat pilot could have been in a lot of trouble after a minute of flying around blind. Good thing the EWO was there to reach across the cockpit and take control of the aircraft. Once the pilot recovered, the two-ship landed uneventfully.

Troubleshooters found that the sound suppression foam used inside some air conditioning ducts had deteriorated. It was original equipment—old, brittle and dry (a lot like the original pilot who's now retired). The foam apparently chose this flight to break down into small particles that were picked up by the air conditioner's airflow and carried into the cockpit.

There was a problem with the airflow too. Some time earlier when maintenance was performed in the main wheel well, someone unhooked and moved the air conditioner's pressure sensing line out of the way. When he or she was done, the line wasn't properly secured. After a while, a leak in the pressure sensing line sent the signal to the air conditioner that the cockpit needed more air. It had been blowing pretty near full blast for half the mission when the particles attacked.

Maybe you don't work on one of the more . . . uh . . . mature Air Force aircraft like this one (the EF-111 is new to the inventory; however, some of its equipment is original F-111A model vintage from whence it came). But chances are excellent you still have the opportunity to move things out of your way while you're trying to fix a sick system. Sometimes the things that seem to be intentionally placed in our way aren't even mentioned in the tech data or work card. Those can be the little foxes that spoil the vine.

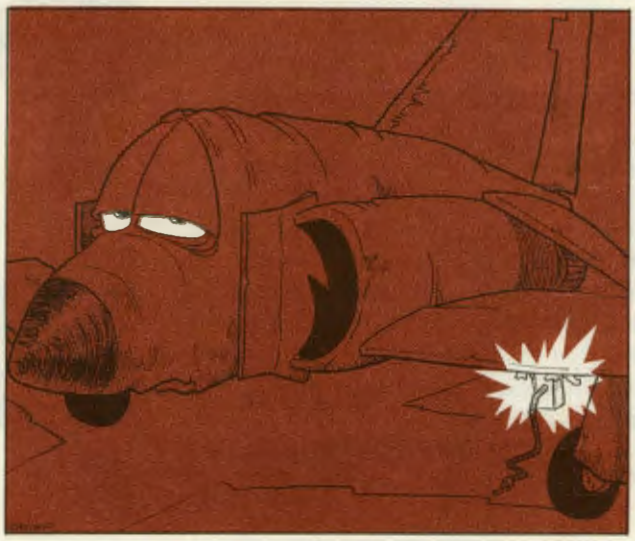
After a job where we encounter these things that get in the way, we have some extra responsibilities when it's time to button up. First, since they may not be covered in the tech data, it's up to us to remember to put them back together. Second, to do that, it may mean looking at another TO or getting some help from someone else to see how to correctly assemble, torque, wire, etc. Finally, to save the next guy from all this trouble, we should suggest these little omissions be included in the tech data for the original job that we started.

Sounds like some extra work. But there are two good reasons to go for it. First, you may save some pilot from flying around blind up there some day (or something worse). Second, if "they" adopt the changes to the procedure that you recommend, you'll be saving a lot of time and trouble for the next guy who has to do the work—who knows, a few months down the road it may be you.

Chock chewing

Some time ago, an engine specialist was hurt when the aux air door slammed shut during engine shutdown. He had been troubleshooting an oil leak and apparently was so engrossed in his work that he momentarily forgot about this infamous characteristic of the Phantom. This sad incident reminded us once again that when electrical power is interrupted or shut off, the aux air doors can slam shut. So we should use the aux air door locks anytime there's work to be done inside. We also need to remember that's not the only danger underneath the Phantom.

An F-4 had to taxi back from the arming area when the arming crew noticed hydraulic fluid dripping from the speedbrake well. Once the aircraft returned to the chocks, a hydraulic specialist plugged in the intercom and asked the pilot to lower the speedbrakes. Contrary to the tech data, he placed a wheel chock vertically in the recess within the speedbrake well while he searched for the source of the leak. When he discovered a leaking B-nut, he told the crew chief he'd have to come back. So the crew chief took the headset and told the pilot to shut down the engines. When the generators dropped off the line, not



CHOCK TALK

only did the aux air doors close, so did the speedbrakes. And the chock was stronger than the speedbrake; it punched an $11,000, six-inch hole in the metal.

In both cases, the tech data that was designed to prevent incidents and accidents like these was ignored for some reason. We may never know how good the reason was—but we do know the results—and we can't afford them. Use the book.

Attenshun to dee-tail

You've heard it before, right? *Attention to detail.* It may be an overworked phrase, but the idea is critical to what we do in the Air Force. If you don't get a fund cite on your TDY orders, you don't get any money. If Finance messes up your pay, you find it hard to buy groceries.

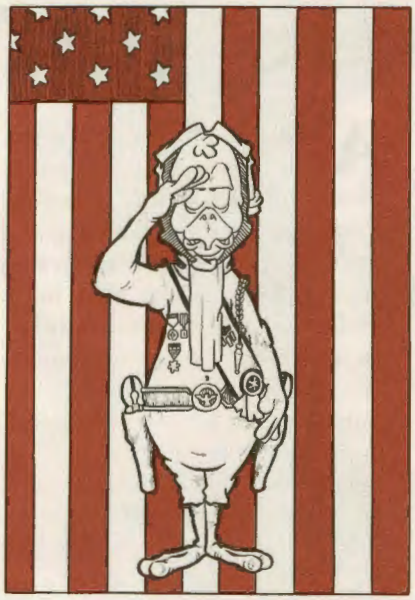
An F-5 pilot discovered what happens if a minor detail like a cotter pin is left out of a supposedly completed job. During a functional check flight, one of the engines stuck at full military power and would not respond to any throttle movements. High-powered flight is a thrill, but you can get too much of a good thing. The pilot finally had to shut the engine down and return to base for a single-engine landing.

The maintenance troops who took the engine apart found that the throttle cable was completely disconnected. A recent 600-hour inspection involved taking apart the throttle connections, but a vital cotter pin was left off when it was put back together. Neither the engine specialist who did the work nor the seven-level inspector could recall whether or not the pin was put back in. It probably wasn't. Only a small detail, but it played a vital role in the successful operation of the aircraft.

CHIEF OF STAFF INDIVIDUAL SAFETY AWARD

The Chief of Staff Individual Safety Award for 1984 is presented to Lieutenant Colonel Henry R. Kramer, Chief of Safety, 56th Tactical Training Wing, MacDill Air Force Base, Florida, in recognition of his outstanding contributions to the accident prevention programs of the Tactical Air Command and the United States Air Force.

FLEAGLE SALUTES



Sgt Andrew J. Clary, 33d Equipment Maintenance Squadron, 33d Tactical Fighter Wing, Eglin AFB, Florida. Sergeant Clary was driving a bobtail towing vehicle when he suddenly heard a loud explosion, then he saw smoke rising from underneath the hood. He pulled to the side of the road, grabbed the fire extinguisher and went to the front of the vehicle where he saw flames inside the engine compartment. He extinguished the fire through an opening in the fender well. Had he opened the hood to fight the fire, the fire could have intensified, possibly causing personal injury and greater vehicle damage.

Sergeant Lee DeSiano, 347th Aircraft Generation Squadron, 347th Tactical Fighter Wing, Moody AFB, Georgia. During a routine EOR check, Sergeant DeSiano was inspecting the left main landing gear on an F-4E when he noticed something just didn't look right. Upon closer examination, he discovered that the cotter pin was missing from the gear scissors bolt. Uncorrected, this bolt could have vibrated loose in a short period and caused a serious landing gear malfunction. The fact that Sergeant DeSiano found such a significant yet tiny detail in such a short period of time is commendable.

Sergeant Daniel Eighinger, Airman First Class Robert Maas, and Airman First Class Stephen Taylor, 56th Aircraft Generation Squadron, 56th Tactical Training Wing, MacDill AFB, Florida, were performing end-of-runway checks on two MacDill F-16s that were already in the EOR parking area when a Nellis F-16 taxied to the area. As the Nellis plane approached its parking slot, the crew noticed that the left main gear was on fire. They quickly waved all other aircraft in EOR out of the area, ran for the fire extinguishers, and put out the fire. The timely actions of Sergeant Eighinger, Airman Maas Airman Taylor, and minimized damage to a valuable Air Force aircraft.

Sergeant Robert Yutzy, 23d Component Repair Squadron, 23d Tactical Fighter Wing, England AFB, Louisiana, was performing the egress portion of an aircraft acceptance inspection on an A-10A that had received major repairs from a contractor. He was removing the ejection seat to check its components when he noticed the M-26 initiator line was disconnected, plugged, and tucked behind the catapult, which made the egress system inoperable. He investigated further and discovered that the contractor had installed a new catapult assembly. Rather than simply fix the discrepancy, Sergeant Yutzy called quality assurance and wing safety and helped them draft a message that went to all A-10 units alerting them of this potential problem.

Airman First Class Eric A. Anderberg, 1st Equipment Maintenance Squadron, 1st Tactical Fighter Wing, Langley AFB, Virginia. During a thruflight on a transit CT-39, Airman Anderberg found that the brake bolts had been mounted backwards and were chafing on the antiskid system. He quickly notified his supervisor and the problem was corrected.

Staff Sergeant Lester L. Billings, Airman First Class Cecil A. Brunson, and Airman First Class John R. Spradlin, 33d Aircraft Generation Squadron, 33d Tactical Fighter Wing, Eglin AFB, Florida. During the launch of an F-15, the jet fuel starter (JFS) disintegrated. This caused a fire beneath the aircraft which was fed by fuel being pumped to the JFS and residual fuel vented during the number two engine shutdown. Working as a team, Sergeant Billings, Airman Brunson, and Airman Spradlin extinguished the fire and moved the aircraft away from other aircraft. Their quick reaction to this situation kept a more serious mishap from developing.

The aero

As your Command Surgeon, I want you to know that from a human-factors standpoint, we have two major goals to work on together: the first is to elevate your capability to perform in the modern fighter environment. As an *old* (surviving) flight surgeon and fighter pilot, I have a personal interest in you as a TAC aviator—I want you to live a long, healthy life and be *the best*. In my first article for *TAC ATTACK*, I want to share a few thoughts and introduce a new concept—a new way for you to think of yourself—as a special kind of athlete, an aerospace athlete.

By and large, our new weapons systems are single seaters. In many cases—in the weather, at very low altitude, and when *remembering* to lead a hard turn with a good straining maneuver—you're on your

space athlete

Brig Gen Rufus M. "Dee" DeHart
TAC Command Surgeon
Langley AFB, Virginia

own. As a single-seat driver, you're it. Therefore, it stands to reason that you *need* to be the best you can be because being alone, you're more susceptible to human-factor mistakes.

Really good fighter pilots I have known have been good aviators—smart, aggressive, with an inherent desire to excel. They have also had a thorough understanding of their aircraft's flight envelope. These are constants. Today, however, there is more. Physiological stresses, workload and perceptual demands on the pilot during many mission scenarios are formidable. And perhaps for the first time, man is the potential limiting factor in realizing the full capability of a weapons system. Yesterday we worried about over-G-ing the aircraft; today (particularly in the F-16), we worry about over-G-ing the pilot. One could construct a future air-to-air engagement between two adversaries flying fighters with comparable performance where the outcome is decided solely on the basis of who is in the best physical condition.

Really good fighter pilots from here on out are going to have to be physically healthy and in excellent physical condition. They will need a thorough understanding of their *body's* flight envelope.

I believe our pilots can perform quite well in the 9-G environment—if they are properly selected, educated, trained and conditioned physically. To realize these goals, fighter pilots will need to develop a new mental set, to think of themselves as a special kind of professional athlete—an aerospace athlete.

Many aspects of fighter operations are quite similar to professional athletics—football for example. We have a playing field and game strategy, rules and plays. We wear a special uniform designed to reduce injuries. We have offensive, defensive and special teams. We have a head coach—the wing commander, and assistant coaches—squadron/flight commanders, ops officer, etc. Our athletes are expensive—$1.5 million a piece. We bring our rookies to summer camp at LIFT (AT-38 lead-in fighter training at Holloman AFB, New Mexico); then, we polish their skills during preseason games at RTU. We have special playoffs, like Gunsmoke and William Tell, and we are constantly preparing for the Super Bowl—WW III. We have our own fouls and penalties when the rules of the game are broken. Some of our broken plays—SD (spatial disorientation), GLC (G-induced loss of consciousness), midairs and CWG (collisions with the ground)—have serious consequences. We can be retired (from life) and our coaches are in danger of losing their jobs after a poor season.

I'm sure you get the idea. But one very basic ingredient of professional athletics that I haven't mentioned is physical conditioning. I would expect that many of you have placed a low priority on physical conditioning programs because of your busy schedules and because they aren't mandatory. If this is the case, please re-evaluate your priorities. A regular physical conditioning program, like the one recently sent to the field, will definitely increase a pilot's ability to endure high Gs. Therefore, he can handle high G-loads for a longer period before the onset of fatigue. Indirectly, this reduces the potential for GLC incidents.

A conditioning program will also increase the strength of your neck muscles. Why is that important? Neck sprains and strains have been common occupational hazards of fighter pilots for many years. In the past, most have been minor; the players only missed a few days of practice. Today, however, we are beginning to see some serious neck injuries—compression fractures of cervical (neck) vertebra and herniated cervical disks (the soft padding between disks). Physical conditioning helps prevent neck injuries.

Your team physician's main purpose in life is to keep you players in top condition and help you get ready for the Super Bowl. Use him. He or she can help you establish a good physical exercise program to condition yourself and your players.

DOWN TO EARTH

ITEMS THAT CAN AFFECT YOU AND YOUR FAMILY HERE ON

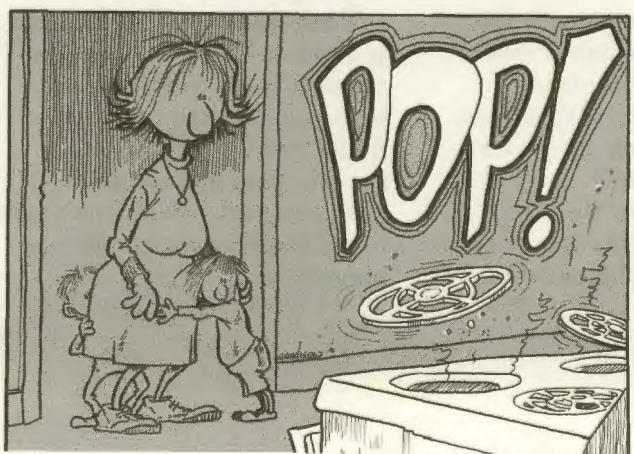
Hodgepodge

A recent automobile accident involving a military member once again surfaced the danger of carrying a gasoline container in the trunk of a car. He was driving down the road and was hit head-on by another car. In two minutes, both cars were engulfed in flames. Upon impact, the cap came off the gasoline container. A small fire had already started in the engine due to a broken fuel line and was rapidly fueled by the fuel/vapors that spilled from the container.

Other factors were involved: alcohol and not wearing seat belts. But the real danger was carrying that extra container of gasoline in the trunk of the car. It was fatal.

• • •

After a contractor had finished repairing the stove at a child care center, one of the attendants decided to clean it up. After cleaning, she left the burners on to dry the stove, then went into the dining area to feed some of the smaller children. A few minutes later, she heard a pop coming from the stove, then she saw flames. She ran to the stove, turned off the burners and pulled the extinguisher D-ring that activated the dry-chemical extinguishing system above the stove.



She ran back to the dining area to evacuate the kids, picked up three of them all at once and started to run out, but she slipped on the dry chemical substance and fell against the wall. Everyone got out OK, except for the attendant's badly strained back. Beware of that dry-chemical stuff — it can be slippery. The fire might not get you, but the slippin' and slidin' will.

• • •

Good supervisors not only have to be made of the right stuff, they have to provide the right stuff. A maid was cleaning a bathroom at the VOQ. She was standing on the edge of the bathtub with her left hand up against the wall tile to brace herself, using her right hand for cleaning. She leaned forward to reach for a high spot, lost

her balance and jammed her elbow against her ribs. She knew the proper procedure was to use a ladder or stool, which should have been available; however, the portable aluminum ladders that she normally used had been turned in by her supervisor because they were defective. The supervisor didn't order new ones.

• • •

This lady was using the right equipment. She was standing on a 4-foot metal workstand to dust a chandelier at an officers' club. The 4-foot wide chandelier was secured to a ½-inch threaded pipe in the ceiling by a ½-inch threaded decorator cap. And that's what caused the problem, you couldn't see the cap threads to tell how far it was screwed into the support pipe. So while she was steadying the chandelier with her left hand and dusting the lights with her right hand, the chandelier came loose, fell and hit her on the head.

This club decided to install hex nuts on all ceiling supports so the thread could be seen before putting on the decorator cap.

Asbestos- First a friend, now a foe

Anyone who reads the newspaper or watches the news on TV has heard about asbestos. This natural mineral fiber found in rocks has turned out to be a bad guy, although it has good qualities: it's resistant to fire and acid, strong and a great insulator.

Manufacturers have been using asbestos in household products for years. Here's a list of things in your home that could contain asbestos:

- Vinyl floor tiles and vinyl sheet flooring.
- Insulation on hot-water and steam pipes and some furnace ducts.
- Some roofing shingles and sidings.
- Cement sheets, millboard and paper to insulate walls from woodstoves.
- Door gaskets on woodstoves, coalstoves, furnaces and ovens.
- Insulation around oil, coal and wood furnaces in older homes.
- Patching compounds sold before 1977.
- Textured paints sold before 1978.
- Wall and ceiling insulation in homes built between 1930 and 1950.
- Hair dryers built before 1979.

The Consumer Products Safety Commission (CPSC) recommends three ways to deal with asbestos in your home. First, leave it alone. Asbestos fibers will only be released into the air if the asbestos-containing materials start to crumble. Second, cover the materials with tape or spray paint. And third, only as a last resort should you consider yanking out the asbestos-containing materials. And if that is your decision, consult a trained asbestos contractor.

For more information, call the CPSC hotline at 1-800-638-2772 (Maryland, 1-800-492-8363).

Computerized running shoes. Yep, you read it right; now on the market are two running shoes with a computer in the tongue. In one shoe, the runner punches in stride length and weight into the tiny computer. The shoe then measures and provides a reading of how far you've run, how long it took you, average speed and how many calories you burned. The other shoe has a disc

that's compatible with two common personal computers. After a run, the computer in the shoe is plugged into the personal computer and plots distance, time and speed on a graph. Cost of the shoes: $125 to $200.

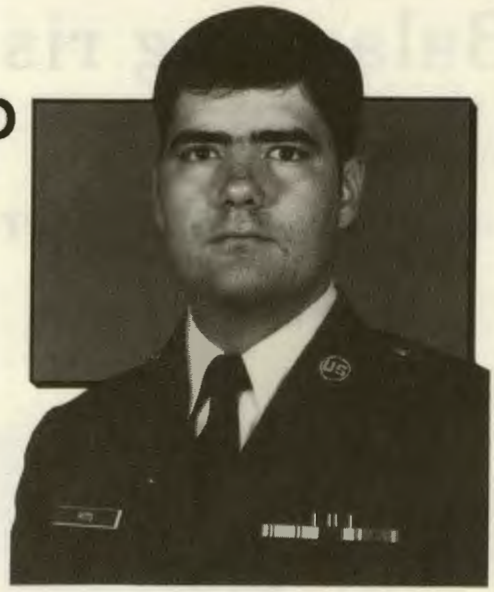
Changing over from day to night shift (at weekly intervals) can be tough on a person's circadian rhythm. Biologist Charles F. Ehret from the Argonne National Laboratory near Chicago has devised a special weekend diet that could help make the transition easier on the old bod: Friday, eat a high-protein breakfast and lunch and a high-carbohydrate supper; drink caffeinated beverages between 3 and 5 p.m. only. Eat less on Saturday, keeping carbohydrates low and only drink caffeinated beverages in the morning. Stay up late Saturday and sleep late on Sunday, then eat a high-protein breakfast and lunch and a high-carbohydrate supper.

Survival Kit for Young Campers. The National Association of Search and Rescue reports spending 50,000 hours a year to respond to emergency needs of at least 500 people; ⅔ of that total are children. And a child doesn't have to be in the back country to get lost, it can happen anywhere he or she suddenly loses sight of familiar surroundings. Panic sets in and causes children to not respond to searchers. Survival experts recommend teaching your child to trust rescuers and that each child carry this mini-survival kit at all times.

- A large yellow or orange plastic trash bag. By poking a hole in a corner, a child can put the bag over his head to use as shelter; stuffing the bag with leaves or grass provides protection against hypothermia; and suspended from a bush, the bag provides shade from the sun.
- A whistle — the sound travels farther than a voice.
- Metal or plastic mirror — flashes can be seen as far as 20 miles away.
- Candy and a canteen of water.
- If the child is old enough, a pocket knife and waterproofed matches.

Football season is almost here. Now would be a good time to get a mouth guard. Oral surgeon and former president of the American Dental Association I. Lawrence Kerr says that mouth guards in organized football could prevent about 150,000 injuries a year. And besides football, he also thinks mouth guards should be worn in sports such as soccer, wrestling, gymnastics and weight lifting. "Boil and bite" guards (plastic devices that shape themselves to your mouth after being boiled in water) cost as little as $2; custom-made guards, which offer more protection and have to be made at a dentist's office, cost up to $50.

INDIVIDUAL SAFETY AWARD



Sgt George E. Pitts
23 CRS, 23 TFW
England AFB, Louisiana

The 23 CRS pneudraulic shop was having difficulties with the assembly and disassembly of the A-10 aircraft brake. The problem stemmed from not having a means of securing the 98-pound brake while maintenance was being performed.

SGT GEORGE E. PITTS, a pneudraulic system specialist, decided to design and build a brake-holding fixture. After spending many hours working with other shops, he finally developed an effective fixture which saved the shop many man-hours and made a safer working environment.

Sergeant Pitts is also the 23 CRS's safety representative. Since his assignment as safety monitor, there have been no reportable on-the-job injuries.

CREW CHIEF SAFETY AWARD

SSgt Bruce C. Schreiber
1 AGS, 1 TFW
Langley AFB, Virginia

SSGT BRUCE C. SCHREIBER was servicing an F-15 accessory drive with oil. While checking the oil level, he noticed that the new oil was almost clear and had separated from the old oil. A further check revealed that the oil from the cart was very thin and had a sweet smell. Sergeant Schreiber immediately declared the aircraft unsafe for flight due to oil contamination and informed the production supervisor.

Remembering that the same oil cart had been used on another aircraft that was about to begin an engine run, he ran over and informed the crew chief before the engines were started. Acting on his own initiative, Sergeant Schreiber then visually checked the oil on all aircraft on the flying schedule including four with pilots already present at the aircraft. He then checked every other aircraft in the AMU.

Sergeant Schreiber found five aircraft with contaminated oil; one aircraft was within minutes of engine start for a practice functional check flight (FCF).

Balancing risk and the mission

a challenge of fighter employment

Capt Michael L. Straight
Air Force Exchange Officer with Navy Fighter Weapons School (TOPCAT)
San Diego, California

As fighter aircrews, one of the tougher judgments we are paid to make is determining the acceptable balance between mission accomplishment and risk to ourselves and our equipment. Obviously, this judgment plays a major role in developing our wartime tactics and game plans, but this proper mission versus risk balance is just as crucial to our peacetime training.

In combat the specific mission objectives may make the level of acceptable risk fairly clear. For example, an offensive MIG sweep normally requires employing lower risk tactics than a defensive CAP of your own airfield. But in our peacetime training, the proper trade-off of risk versus mission is often less clear. To ensure victory in the next air war, we've got to prepare now with realistic and demanding training. But the more realistic the training, the more we risk our priceless people and very expensive equipment. To be truly prepared for our wartime missions, should we accept combat levels of risk during training? Or is all training risk unacceptable in order to conserve our resources for the actual shooting? The right answer obviously lies between these two extremes, and only a thorough understanding of the training priorities and risks will allow us to judge the proper balance.

As fighter crews involved daily air-to-air and air-to-

ground training, we control both sides of this balance: 1) the level of training risk and 2) the training gained from the accepted risk.

We control risk by judging the limits to realism in our training. Many of the hard limits to realism are specified in published guidance such as the air-to-air rules of engagement (ROE). By specifying minimum altitudes, airspeeds, separation, etc., these guidelines provide some definition to the line between realism and risk, and represent our commanders' judgment of acceptable training risk. But even these well-defined limits require aircrew judgment in their application. For example, with two fighters approaching head-on with 1,200 knots of closure, the maneuver required to comply with the 500-foot minimum separation ROE is based on an experienced judgment, not an easily observable gauge readout. Training guidance, like ROE, attempts to define absolute peacetime boundaries between realism and risk. But *we* determine, for each sortie, whether mission specifics and aircrew experience warrant operating on the dictated edge or at some level short of it.

The other side of the training equation we are paid to control is training effectiveness. We control what is gained from the risks of daily training.

Our training must be demanding — we must be capable of effectively taking ourselves and our equipment to the peacetime limits. But it is up to us to insure that training on the edge provides maximum payoff. We must understand specifically what is to be gained for all risk we accept. Our handle on this is our selection of and adherence to training objectives tailored to each sortie. Effective training objectives identify where we plan to push ourselves and what we expect to gain from the risks of the mission. By adhering to the objectives during the sortie, we avoid wasting time, fuel and risk on less pertinent aspects of the sortie. For example, basic fighter maneuvering entails a certain level of risk; but it's an essential skill for any competent fighter crew. But a prolonged 1-v-1 scissors is an inappropriate waste of risk in a sortie with the objectives and resources for training four-ship employment. Obviously, any risks taken solely for personal entertainment or ego satisfaction are unacceptable.

Risk is part of what we do for a living, war or peace, but it's not simply an aspect of luck or chance. Instead, it's a mission element that must be evaluated and controlled much like fuel or weapons load. And though many of the peacetime limits of acceptable risk are spelled out in our training guidance, the major responsibility for balancing the risk versus mission equation falls to the guy with his finger on the trigger. >

THE FIGHTER PILOT'S EGO

Lt Col Jim Lentzkow
HQ TAC/DOV

Ed. Note: In June 1983, we ran an article by Maj Earle Combs titled "The Fighter Pilot's Ego." The main points of the article are timeless, and so we offer them again for your consideration.

In the aftermath of a fatal aircraft accident, many questions are frequently left unanswered, for example:

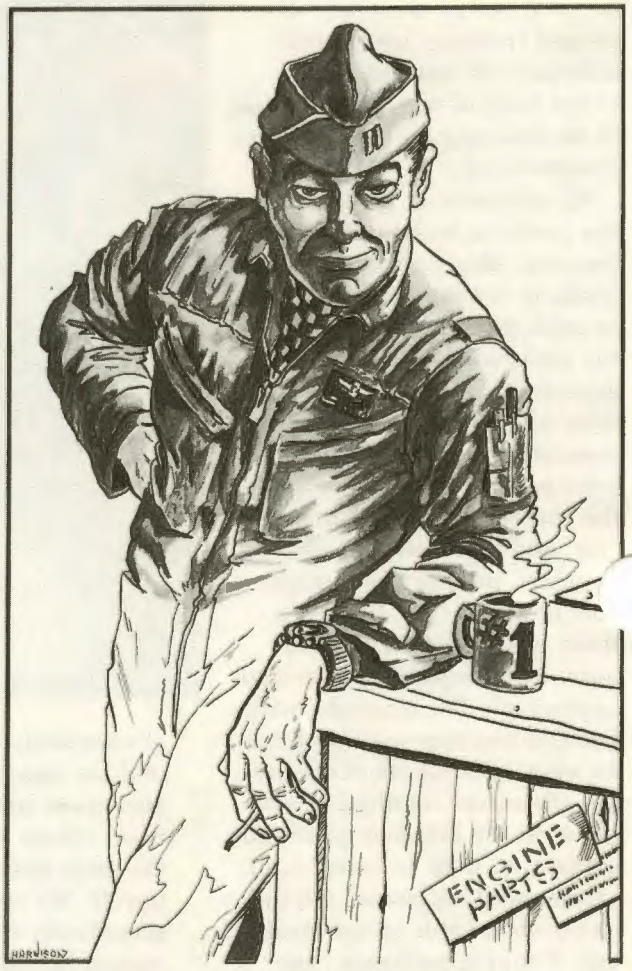
Why did he attempt that maneuver?
Why didn't he knock it off?
Why didn't he eject?

The answer may be the fighter pilot's ego, or more specifically, his continuous drive to become and to remain, the "World's Greatest Fighter Pilot." To a degree, this is expected. There are few callings that require more confidence and self-esteem in order to succeed than that of flying fighters. A fighter pilot without them is actually just a pilot who flys fighters — an accident looking for a place to happen.

Unfortunately, too much confidence is just as bad as not enough. The pilot who exceeds his limits because of over confidence dies just as quickly as the one who goes beyond his capabilities because of limited ability. Although overconfidence can manifest itself in many different ways, two types of pilots come to mind.

The first is the truly qualified pilot who exceeds the limits because he believes he's better than the rest. The rules were made for the "weak link" so he makes his own rules. This pilot is usually very well intentioned and seeks only to give the government the most "bang for the buck." He's not hot-dogging, just performing. Tragically, even the very best pilots make mistakes. Accident briefs are filled with them.

The other overconfident pilot is the one who thinks flying fighters means breaking the rules. This guy is trying to live up to an image — unfortunately, it's the wrong one. Minimum altitudes are only for "grapes," ROE only for kids and clean living for the Navy. To say he's filled with braggadocio is an understatement. Unfortunately, this kind usually impresses some of the young pilots. Thus, he not only is a problem, he spreads the problem.



What can we do? That's easy. It's all been said before. We need pilots who know that the rules are for everyone. We need quiet, confident leadership (great pilots don't need to talk — their peers will). We need strong flight leaders who not only demand good performance but also display it. We need instructors who realize that a good mission means his trainee flew well, not just himself. We need flying units that realize that the whole is greater than the sum of the parts, and prove it by operating as a team. We need supervisors that recognize this performance and reward it.

TAC TALLY

	TAC			ANG			AFR		
	JUN	THRU JUN		JUN	THRU JUN		JUN	THRU JUN	
		1985	1984		1985	1984		1985	1984
CLASS A MISHAPS	1	10	14	2	7	3	0	0	0
AIRCREW FATALITIES	0	6	11	2	4	2	0	0	0
TOTAL EJECTIONS	1	8	11	0	5	2	0	0	0
SUCCESSFUL EJECTIONS	1	7	9	0	5	1	0	0	0

TAC'S TOP 5 thru JUN 85

TAC FTR/RECCE			
class A mishap-free months			
35	405 TTW	(F-15,F-5)	Luke AFB, AZ
29	1 TFW	(F-15)	Langley AFB, VA
28	33 TFW	(F-15)	Eglin AFB, FL
26	366 TFW	(EF/F-111)	Mtn. Home AFB, ID
25	49 TFW	(F-15)	Holloman AFB, NM

TAC AIR DEFENSE			
class A mishap-free months			
149	57 FIS	(F-4)	Keflavik, Iceland
102	5 FIS	(F-15)	Minot AFB, ND
99	48 FIS	(F-15)	Langley AFB, VA
58	318 FIS	(F-15)	McChord AFB, WA
49	87 FIS	(F-106)	Kl Sawyer AFB, MI

TAC -GAINED FTR/RECCE			
class A mishap-free months			
150	138 TFG	ANG(A-7)	Tulsa, OK
149	917 TFG	AFR(A-10)	Barksdale AFB, LA
127	114 TFG	ANG(A-7)	Sioux Falls, SD
116	183 TFG	ANG(F-4)	Springfield, IL
113	180 TFG	ANG(A-7)	Toledo, OH

TAC-GAINED AIR DEFENSE			
class A mishap-free months			
132	177 FIG	ANG(F-106)	Atlantic City, NJ
98	125 FIG	ANG(F-106)	Jacksonville, FL
81	119 FIG	ANG(F-4)	Fargo, ND
65	107 FIG	ANG(F-4)	Niagara Falls, NY
56	147 FIG	ANG(F-4)	Ellington AFB, TX

TAC-GAINED Other Units			
class A mishap-free months			
191	182 TASG	ANG(OA-37)	Peoria, IL
175	110 TASG	ANG(OA-37)	Battle Creek, MI
171	USAFTAWC	(many fighters)	Eglin AFB, FL
163	84 FITS	(T-33)	Castle AFB, CA
105	552 AWACW	(E-3, EC-135)	Tinker AFB, OK

CLASS A MISHAP COMPARISON RATE

(BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	1985	3.2	3.4	2.7	2.4	2.9	2.7						
	1984	3.4	4.3	3.3	2.5	2.9	3.8						
ANG	1985	4.8	4.8	3.0	4.5	4.3	5.1						
	1984	0.0	2.3	1.5	2.2	2.6	2.1						
AFR	1985	0.0	0.0	0.0	0.0	0.0	0.0						
	1984	0.0	0.0	0.0	0.0	0.0	0.0						

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FLEAGLE
OOPS!
ANOTHER DROPPED OBJECT.
THERE'S MY GOGGLES. BET THEY IS ALL BENT AN' FULL O'DIRT.
© STAN HARRISON 1985
TH' FOLKS IN HIGH PLACES SURE MAKE A FUSS 'BOUT THINGS FALLIN' OUTTA TH'SKY.
WIPE
WIPE
I JUS' DON'T SEE WHAT A LITTLE BITTY THING FALLIN' TO TH'GROUND CAN...
SNAP
SNAP
HARRISON
FRUMP!
HURT.