

# TAC ATTACK

JULY 1985

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Could it happen to me ?

IFF





# ANGLE OF ATTACK

## *TAC Attack— A PROACTIVE SAFETY TOOL*

**A**re you using *TAC Attack* in your daily operation? If not, you are missing a considerable amount of valuable information. Worse, recent history has grimly shown that many of our mishaps were discussed in *TAC Attack* before they occurred.

Obviously, we are not clairvoyant. But we study Class A, B and C mishaps and high accident potential reports; we travel extensively throughout the command; we have access to volumes of statistics; and we have regular discussions with many of you, the experts in the trenches (most of our articles come from you). Consequently, we have the opportunity and the responsibility to see a larger slice of the picture.

F-16 low-altitude airtasks, G-induced loss of consciousness, F-16 AOA probe icing, use of the HUD and many articles on human factors and the philosophy of smart, therefore safe, execution—that's not history, it's where we live. One of our recent subjects was spatial disorientation. Unfortunately, some of our aircrews apparently did not take advantage of the lessons . . .

Perhaps some outfits don't realize that we don't send *TAC Attack* to every TAC organization (you have to request it). Perhaps there are too few copies in the right places. Perhaps the magazine is being hoarded in desk drawers, lockers and

briefcases by folks who want to hold it until they have time to fully digest a key article.

I urge you to go back a few issues, spend an hour distilling information that's pertinent to you, learn the lesson and apply the principles. Use the articles as points of departure for discussion with the troops. Then, if you find we are off track, or that you have a better idea, drop us a line or call. If we all share the insights from *TAC Attack* with co-workers, subordinates and family members, it will make our jobs and our lives more productive, thus safer.

Finally, we all learn our best lessons firsthand. That means the great ideas for articles will continue to come from you. Instead of just sharing your good ideas locally, use *TAC Attack* to pass them along to other people who need to know. That gives you a big part in mishap prevention. It's also worth a significant OER comment for a young guy who's flyin' and fightin' for a living.

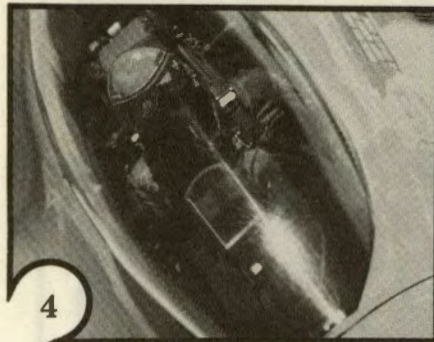
Make certain that *TAC Attack* is on top of your professional tool kit. Don't leave the epitaph "If only he had read *TAC Attack*."

HAROLD E. WATSON, Colonel, USAF  
Chief of Safety



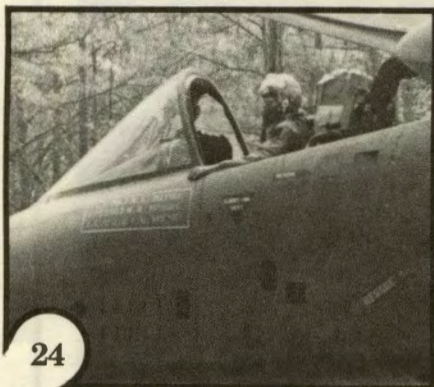
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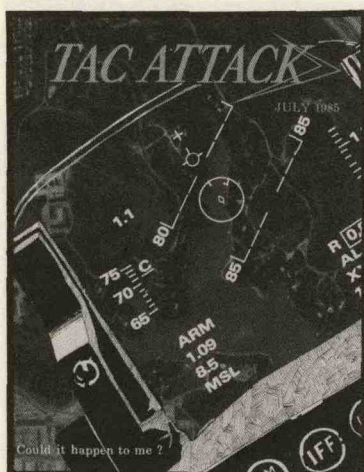
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# GLC

## Could it happen to me





e?

**2d Lt J. Lloyd Eldredge**  
**61 TFTS**  
**MacDill AFB, Florida**

**G**-induced loss of consciousness (GLC) is a touchy subject in the F-16 community. I'm speaking with authority because it happened to me.

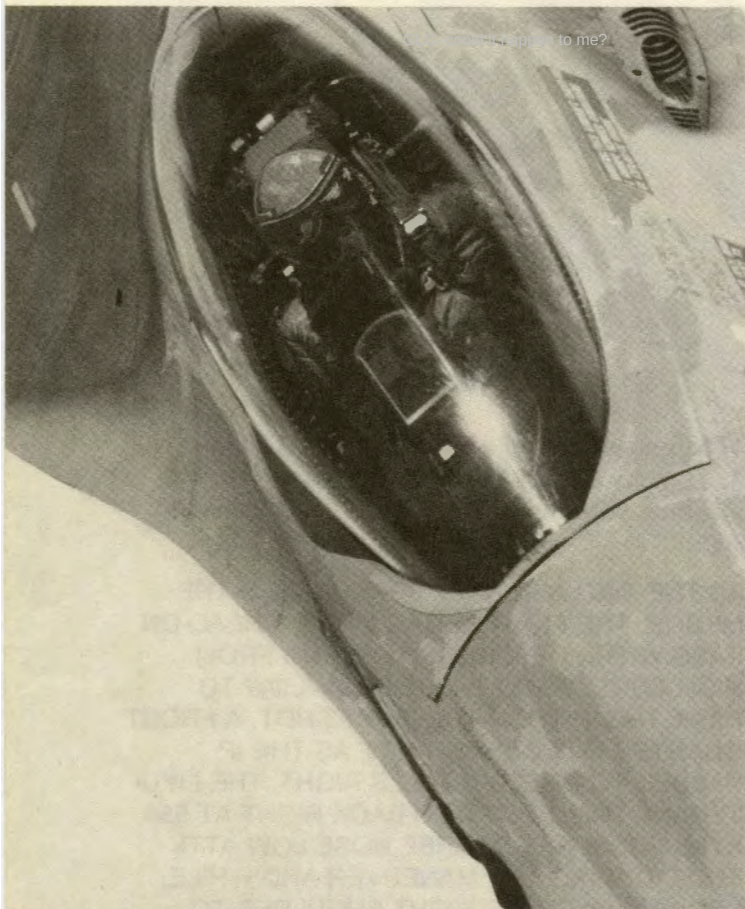
AS THE TWO AIRCRAFT APPROACHED THE MERGE, THE FIGHT BEGAN FROM A HEAD-ON PASS WITH LT ELDREDGE COMING FROM HIGH TO LOW AND THE IP FROM LOW TO HIGH. THE IP TOOK THE FIRST SHOT, A FRONT QUARTER FOX 2 LIMA. THEN, AS THE IP PASSED TO LT ELDREDGE'S RIGHT, THE LIEUTENANT TRIED TO PITCH BACK RIGHT AT 550 KTAS FROM A 15-DEGREE NOSE LOW ATTITUDE. DURING THE MANEUVER AND WHILE LOOKING OVER HIS RIGHT SHOULDER TO MAINTAIN TALLY, LT ELDREDGE LOST CONSCIOUSNESS. UNATTENDED, THE AIRCRAFT TRANSITIONED TO A STEEP DIVE, 60 TO 70 DEGREES NOSE LOW WITH A STEEP LEFT BANK AND ACCELERATED THROUGH 700 KTAS. AFTER REGAINING USEFUL CONSCIOUSNESS, LT ELDREDGE BEGAN PULLING OUT OF THE DIVE AND FINALLY LEVELED THE FALCON NEAR 6,000 FEET ABOVE THE WATER.

This article is not a discourse on how to increase G-tolerance, but I would like to tell you what happened to me and share with you some insights I've gained the hard way.

There are many factors contributing to the



# GLC – Could it happen to me?



mishap, and all should be taken into account; however, the cause of the GLC incident was that I did not perform a proper G-straining maneuver. I was flying an ACM (air combat maneuver) mission over the Gulf of Mexico, 2-v-1 against an F-15. After six short engagements, the F-15 reached bingo fuel and departed. We still had fuel remaining and set up for a 1-v-1 intercept to an engagement. There was a slight haze below us so I opted to go high, hoping for a cold intercept. Lead had the same idea but detected me and went lower to obtain turning room. As is usually the case, my cold intercept became hot pretty fast, and we met 180 degrees out. My aircraft

was 15 degrees nose low, and I had 500-plus KCAS at the merge.

I snatched the stick to the limiter in an effort to pitch back into the fight at FL 240 and became somewhat coherent passing 10,500 feet. I recovered at 5,900 feet still totally disoriented and called "Knock it off." I wasn't afraid; I didn't even fully understand what had happened. It wasn't until we were headed home that I began to realize that I probably had a GLC experience.

The videocassette confirmed my suspicions, and finally on the ground I realized how close I had come to actually dying. A factor contributing to the GLC occurred just prior to the merge when lead called a missile shot. Startled, I immediately began pulling before initiating my straining maneuver. My intentions were to pitch back, but as I reached 8.2 Gs I exhaled and went from tot

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**I received no warning symptoms, no gray-out and no narrowing tunnel vision.**

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visual acuity to unconsciousness. I received no warning symptoms, no gray-out and no narrowing tunnel vision. The plane performed a dishd out barrel roll ending up 60 degrees nose low and accelerated to about Mach 1.1 at 10,500 feet. I was unconscious for only 12 seconds, but had I delayed my pullout five seconds longer, I would not be writing this article.

In summary, the factors contributing to the incident were fatigue, a poor G-straining maneuver, looking back over my shoulder and the lack of visual symptoms. The lesson learned is a healthy respect for the capabilities of the F-16. I also learned that my habit patterns have not been reinforced with enough time and experience. I thought that my straining maneuver was something I subconsciously performed as I needed it, and it usually is. Today I'm no longer willing to bet my life on it. Are you? ➤



# AIRCREW OF DISTINCTION



On 10 January 1985, MAJ ROGER E. TAYLOR was returning his F-5E to base for landing following a 2-v-2 dissimilar air combat training mission. After a routine overhead traffic pattern, Major Taylor landed his Aggressor aircraft on-speed at 135 knots, 500 feet beyond the threshold. At touchdown, the mission abruptly departed the realm of routine—two components of the landing gear system failed, triggering an uncommanded gear retraction.

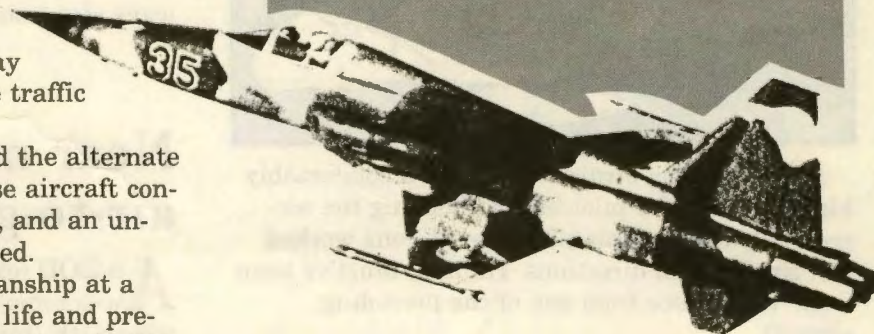
As the aircraft undercarriage began to collapse, Major Taylor sensed a settling motion at the same time he noticed several cockpit indications of unsafe gear. His response was immediate: he selected full afterburner and skillfully kept the aircraft from fully settling onto the runway. Flying inches above the runway while the engines were still accelerating from idle to afterburner, the aft portion of the tail section and landing gear doors scraped the concrete runway. After a very long moment, the aircraft began to accelerate, and Major Taylor gently flew the aircraft away from the runway and back into the traffic pattern.

Once airborne, Major Taylor used the alternate extension to lower the gear. A chase aircraft confirmed the rollers down and locked, and an uneventful straight-in full stop followed.

Major Taylor's outstanding airmanship at a critical moment in flight saved his life and prevented the loss of a valuable fighter aircraft. He has earned the Tactical Air Command Aircrew of Distinction Award.



**Maj Roger E. Taylor**  
57 FWW  
Nellis AFB, Nevada





# TAG

tips

INTEREST ITEMS,

## Unbinding the strongman

**R**oll out, you pig!" shouted a somewhat concerned OV-10 pilot as he unsuccessfully tried rolling out of the left turn from downwind to base leg on a rocket pass at a nearby range. The more he forced the stick to the right, the more resistance he felt. Meanwhile, the aircraft continued rolling left. As the bank increased through 60 degrees, the pilot stomped hard on the right rudder and managed to coax the Bronco back to level flight. Whew.



After climbing straight ahead to a comfortably high altitude, the pilot began checking the aircraft's flyability. This time the ailerons worked just fine in both directions. Hmmm. Must've been wake turbulence from one of the preceding aircraft.

What would you do at this point?

This troop decided to descend back down, rejoin

his workmates and continue the mission. Anything wrong with that picture?

Here is some wisdom from the School of Hard Knocks that's contained in the 55-series book—*If a flight control malfunction is experienced (including an uncommanded flight control input which apparently returns to normal), terminate the mission immediately and land as soon as practical.*

As it turned out, a bolt in the linkage of the right aileron's trim tab had backed out. At the moment the pilot applied right stick to roll out of the left turn, the bolt caught on the outboard flap and prevented the right aileron from coming up. The binding aileron was finally freed when the strongman used enough stick pressure to shear the bolt.

This fellow got off lucky . . . but we can't always count on that, can we?

## Near miss air-to-ground style

**A**n EOD (explosives ordnance disposal) group was removing scrap and such from a range where HE (high explosive) munitions are routinely delivered. The range was officially cold (no ordnance delivery scheduled or approved). Then



## MISHAPS WITH MORALS, FOR THE TAC AIRCREWMAN

came the ten percent who didn't get the word . . .

As the flight split and alternately rolled in on the off-limits target, the workers scrambled for cover as BDU-33 practice bombs began falling.

One of the men popped a red smoke grenade to signal the pilots that the range was closed. After four hot passes, the flight lead noticed the smoke and called "Knock it off." Then he flew by the target for a little poststrike recce and spied a blue Air Force truck and several people waving their fists at him. Fortunately, no one was hurt.

How do things like this happen? Some minor details were overlooked.

First, the flight lead heard an earful of bad news from the weatherman—the planned low level route was IMC. Flexibility being the key to airpower, the flight lead swung by the ops desk and told the 271 (squadron ops specialist) to shuffle his range times. He requested a longer stay than the schedule reflected on the class A range and he also wanted time on a second range (class C) nearby. Unfortunately, the pilot didn't read the fine print on the range schedule which said that the class C range was *no ordnance only*. And the 271 either didn't hear the request for the class C range or forgot about it; so it was never coordinated.

So the flight gets airborne, drives over to the first range and checks in with the range mother who said, "Forget it, Ace, the bomb scoring equipment is down." So the flight departed for

their back-up mission on the class C range, and now we have this personnel problem finding enough EOD people.

We can help fix their problem by keeping an eye open for details like these when we're putting together a mission . . .

### Smoked tuna

After 25 minutes of flight, a single-ship Oscar Deuce pilot began feeling lousy. He was suddenly nauseous, his visual acuity deteriorated and he felt lightheaded. The symptoms didn't get any better, so he put the O-2 down at the nearest suitable emergency field. After landing, he climbed out of the aircraft and barfed all over the ramp. He was really sick. Good thing he was in a light aircraft; emergency airfields for some aircraft are not so abundant.

His unit had to air-evac a flight surgeon and medical technician into the airfield to attend the pilot. After a while, he was well enough to be med-evacuated back to the base.

All that troubleshooters could find wrong with the aircraft was a small hole in the heater box. Since the pilot had selected defrost and had the vents closed, carbon monoxide may have been the culprit.



Another possibility was lunch, which he ate about two hours before the flight. A tuna sandwich was one of the culinary delights he pulled out of his brown bag lunch that had been kept in his car for a couple of hours before he ate it.

It's not the season for that.

## Hot weather articles give me the FITS

Maj Roger Cude  
ATC Safety  
Randolph AFB, Texas

**Q**uestion: What's harder than reading another article about hot weather ops?

**A**nswer: Writing one that's interesting.

**Q**uestion: If you wanted aircrews to read an article about hot weather and its effects on crewmembers, how would you do it?

**A**nswer: Interview the flight surgeons, read all

available material and then condense it so it will fit in a typical fighter pilot's attention span.

**Q**uestion: Where's the beef?

- A**nswer:
1. FITS = fighter index of thermal stress.
  2. Three zones: normal, caution and danger.
  3. Weather shop determines which zone.
  4. Normal = ops normal.
  5. Caution = limit ramp time to 90 minutes.
  6. Danger = limit ramp time to 45 minutes.
  7. Normal person loses 2-3 quarts of water without exertion. On hot days, you can lose that much in an hour.
  8. Should drink 6-8 glasses (6-8 oz) of liquid per day. Water, diluted fruit juice, iced tea, sodas are good replacements.
  9. Salt tablets not necessary.
  10. Significant time required to recover from heat loads absorbed.
  11. Carry and use a plastic water bottle.
  12. Stop at water fountain before and after sortie.

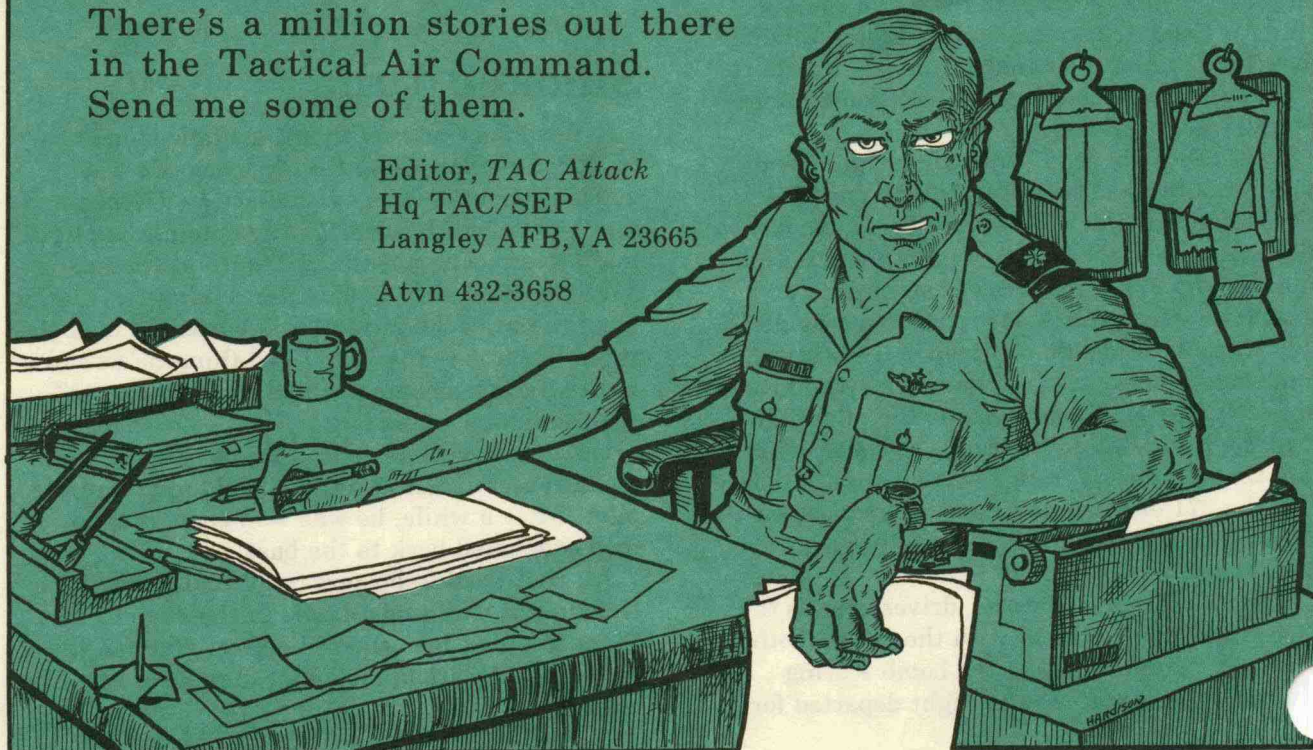
**Q**uestion: How's your hot weather ops attention span doing?

**A**nswer: My what?

Courtesy ATC OPS TIPS

There's a million stories out there in the Tactical Air Command. Send me some of them.

Editor, TAC Attack  
Hq TAC/SEP  
Langley AFB, VA 23665  
Attn 432-3658







# EMERGENCY SITUATION TRAINING

Major Jim Lee  
HQ TAC/DOV

**SITUATION:** On-speed, on-course and on-glidepath. Four miles from touchdown, leading the best formation ILS approach of your life when your number one engine fire handle lights up. Weather is reported solid from 700 to 5,000 feet (so thick you can barely see your wingman), and there's 5 miles vis underneath. Your wingie reports he thought he saw fire coming from your engine. What'cha gonna do now, Ace?

**OPTIONS:** A. Punch out now. Why wait?

B. Keep your wingman in position and call the SOF. Execute the Engine/APU Fire checklist.

C. Tell number 2 to go lost wingman. You execute a go-around.

D. Tell number 2 to go lost wingman. You land.

**DISCUSSION:** If the aircraft doesn't keep flying in a somewhat upright position, Option A is definitely a player; at 4 miles on final on a 3-degree glidepath, you're only about 1,200 feet above the ground. Option B contains some misplaced priorities. Calling the SOF may come later, but now is not the time, and this checklist isn't appropriate once you're configured for landing. First, get the aircraft reconfigured for single-engine flight. Option C has possibilities, but a lot of ifs must be considered: if you aren't within

good ILS parameters to continue; if you are lightweight and aren't carrying anything that increases yaw; if there is plenty of fuel to go around and try it again; and if the weather isn't getting worse, etc. If you decide to go around, make your control inputs smooth and positive. Option D may be the best of these alternatives. First, execute the boldface: **Rudder—Control Yaw** (thus far no problem here); **Throttles—Max** (momentarily, until you have reconfigured); **Speedbrakes—Close** (to get ready for a possible engine failure); **Flaps—MVR** (because the TO says it significantly decreases drag without imposing a severe penalty in stall margin). Accelerate to single-engine airspeed (above 150 KIAS). If you're not out of the weather yet, but you're still flying a decent ILS that will get you below the weather, you're probably in a better position to continue now rather than going around and spending another 10–15 minutes in a sick airplane in the weather. As the Dash One says, "Devote full attention to completing the landing" and "Take care of the fire as time and circumstances permit." To me, that means waiting until clear of the weather or after landing if possible.



# CHOCK TALK

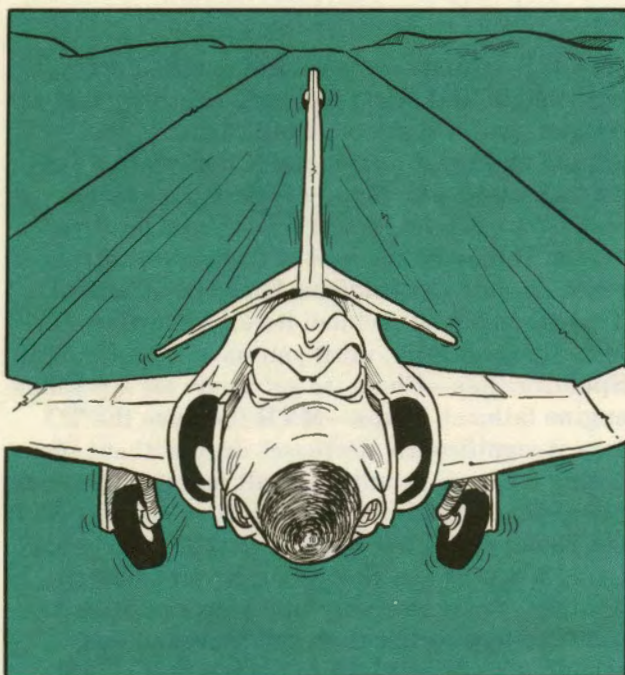
chock talk

Incidents and

## INCIDENTS AND

### Could've been tense

**A**s the F-4's burners lit and accelerated the Phantom down the runway, the aircrew noticed the airspeed stagnating. Looking out the window, it was obvious that the aircraft was racing to get airborne at a greater rate than the airspeed indicator was willing to admit. Since a



wingman was tagging along on this formation takeoff, the flight lead elected to continue the takeoff rather than abort. Once airborne, the air-

speed indicator rolled back to zero and died.

On this mission, it was a simple matter for the pilots to change position and let the aircraft with the reliable airspeed indicator lead the one with the sick gauge back around for a formation landing. But what might have happened to a single-ship aircrew on a dark and stormy night or a day when it was yucky from minimums all the way up?

How'd it happen? A specialist who was working in the cockpit to replace a pressure regulator for the canopy seal had removed the map case in order to get at the regulator. This jet was equipped with a VTR (videotape recorder) which required moving the map case to the left side of the cockpit where the VGH recorder used to be.

Since removing the map case wasn't part of the procedure that he was following, he didn't document its removal in the aircraft forms. Later when the map case was reinstalled, the lines that provided airspeed, G and altitude inputs to the VGH recorder should have been capped off at the back of the map case. But the technician forgot to reconnect the lines. And that's what caused the loss of airspeed.

The tech data has long since been corrected, and the technician learned the importance of complete documentation. But there's another point that supervisors and inspectors should read between these lines—we need to look beyond what's merely written in the aircraft forms to the *substance* of the work that's been done.



## INCIDENTALS WITH A MAINTENANCE SLANT

### Ants and elephants

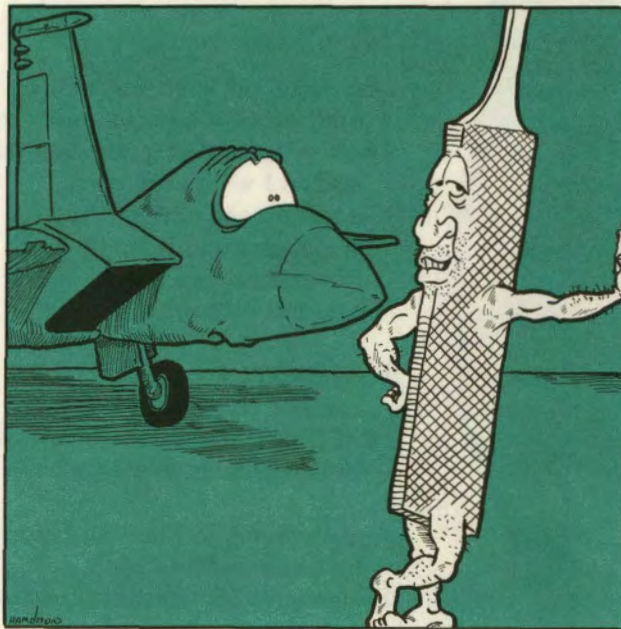
Following the first sortie of the day, an alert F-15 crew chief noticed a nick on a first-stage compressor blade of one of the engines during his thru-flight inspection. *α!\$&\* Couldn't have happened at a worse time—right in the middle of a sortie surge exercise. Oh well, potential engine problems are no respecters of persons—or exercises; better call Red Ball. With any luck the nick will be within limits and we can blend it right here on the spot. The pilot won't even have to hop out of the cockpit.*

A couple of specialists responded to the crew chief's call. One of them climbed into the intake and determined the nick was within TO limits. He began using a file to blend the nicked blade. In the process, however, the file he was using broke in two. So he removed another file from the file box, which held several files, and soon completed the job.

After the specialist hopped out of the intake, he handed the broken file and the file box to the other worker and asked him to check it. In the rush to get the pilot airborne on time, no one noticed the open hole in the file box. What open hole? The one where the second file should have gone. You know, the second file that was left in the intake . . .

Well, the pilot took off on time. He didn't have to climb out of the aircraft and into a spare (which was available). But the recently blended 700 engine took it in the teeth.

No one suspected that anything was wrong un-



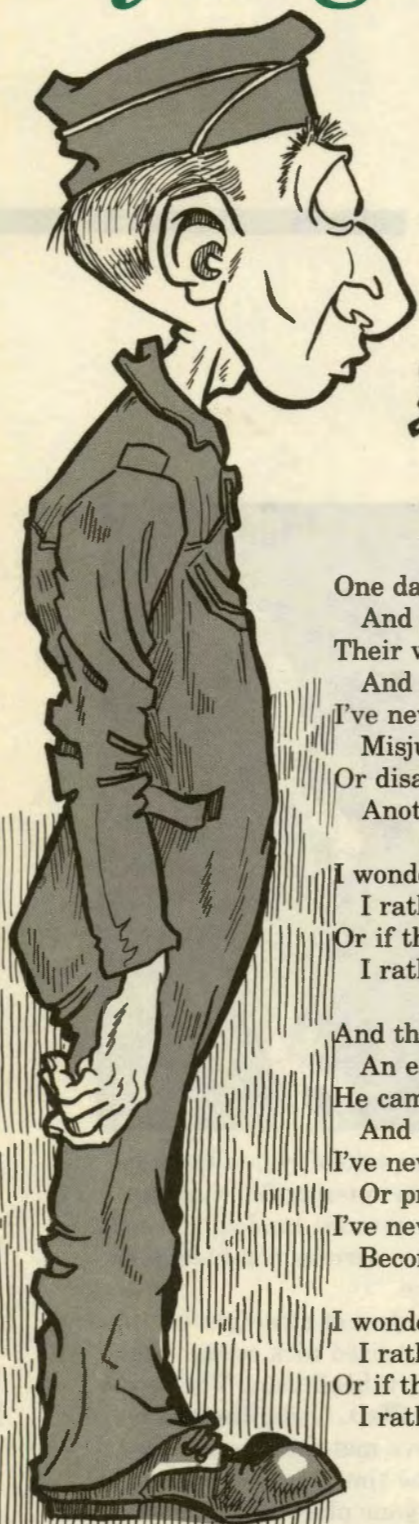
til about a half-hour after takeoff when the file box was turned in and the missing file was discovered. Then, when the aircraft landed, the next intake inspection revealed serious non-blendable compressor blade damage.

Everyone paid a great deal of attention to hurrying to blend the *ant*-sized nick so the pilot could make the almighty takeoff time. The result was some *elephant*-sized FOD. Using the spare aircraft option would have met the mission demands while defusing the time pressure.

Any time pressure at your place? Keep an eye out for the elephants.



# flying safety for the birds ?



One day I sat upon the sand  
And watched two seagulls fly,  
Their wings but slightly cleared the waves  
And so I wondered why;  
I've never seen one in a turn  
Misjudge and hit the ground.  
Or disappear into the drink—  
Another seagull down.

I wonder if they die that way,  
I rather think they don't;  
Or if they'll make that last mistake,  
I rather think they won't.

And then out in the wild I saw  
An eagle holding high,  
He came in hot and shackled his prey  
And then I wondered why;  
I've never seen an eagle foul  
Or press and not abort,  
I've never seen one target-fixed  
Become the latest mort.

I wonder if they hit the dirt,  
I rather think they don't;  
Or if they'll pull out late one day,  
I rather think they won't.

Today I watched a robin land  
As sweetly as you please,  
Next to his nest up in a tree  
And then I said, "Now think;  
Have ere you seen a robin fail  
To land without his feet,  
And cause the Robin Wing DO  
To have a Mozam Beak?"

I wonder if they land gear-up,  
I rather think they don't;  
Or ding their breast by carelessness,  
I rather think they won't.

So why are birds so error-free  
Who have such little minds,  
Whose judgment is restricted to  
What nature gives their kind?  
They master their environment  
With awe-inspiring ease,  
While we commit the same mistakes  
We have since nineteen three.

Have we a chance to be their peers,  
I rather think we don't;  
Or will we master flight as they,  
I rather think we won't.

Capt Tim Murphy  
80 TFS (PACAF)  
Kunsan AB, Korea



# SPECIAL ACHIEVEMENT IN SAFETY AWARD

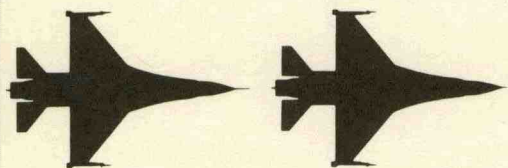
SSGT CHARLES T. THOMPSON and SSGT MICHAEL J. SANDOVAL were standing on the aircraft parking ramp watching a flight of F-4 aircraft take off. After the aircraft were airborne, they turned around to leave the area and noticed some workers from a TDY organization towing a C-130. They saw that there were no wing walkers around the aircraft and the aircraft was not following the taxi lines. When the right wing tip of the aircraft under tow was about 10 feet from hitting the flight station of a parked C-130, they took quick action.

Sergeants Thompson and Sandoval immediately ran toward the tow vehicle and got the operator's attention; the operator stopped the vehicle. They also helped the TDY unit establish a wing walker and realign the aircraft on the taxi line; the towing operation was then successfully completed.

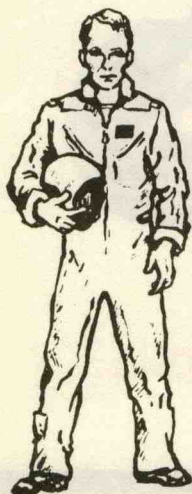


SSgt Charles T. Thompson  
SSgt Michael J. Sandoval  
24 CAMS, 24 COMPW  
Howard AFB, Panama

## HEADS UP



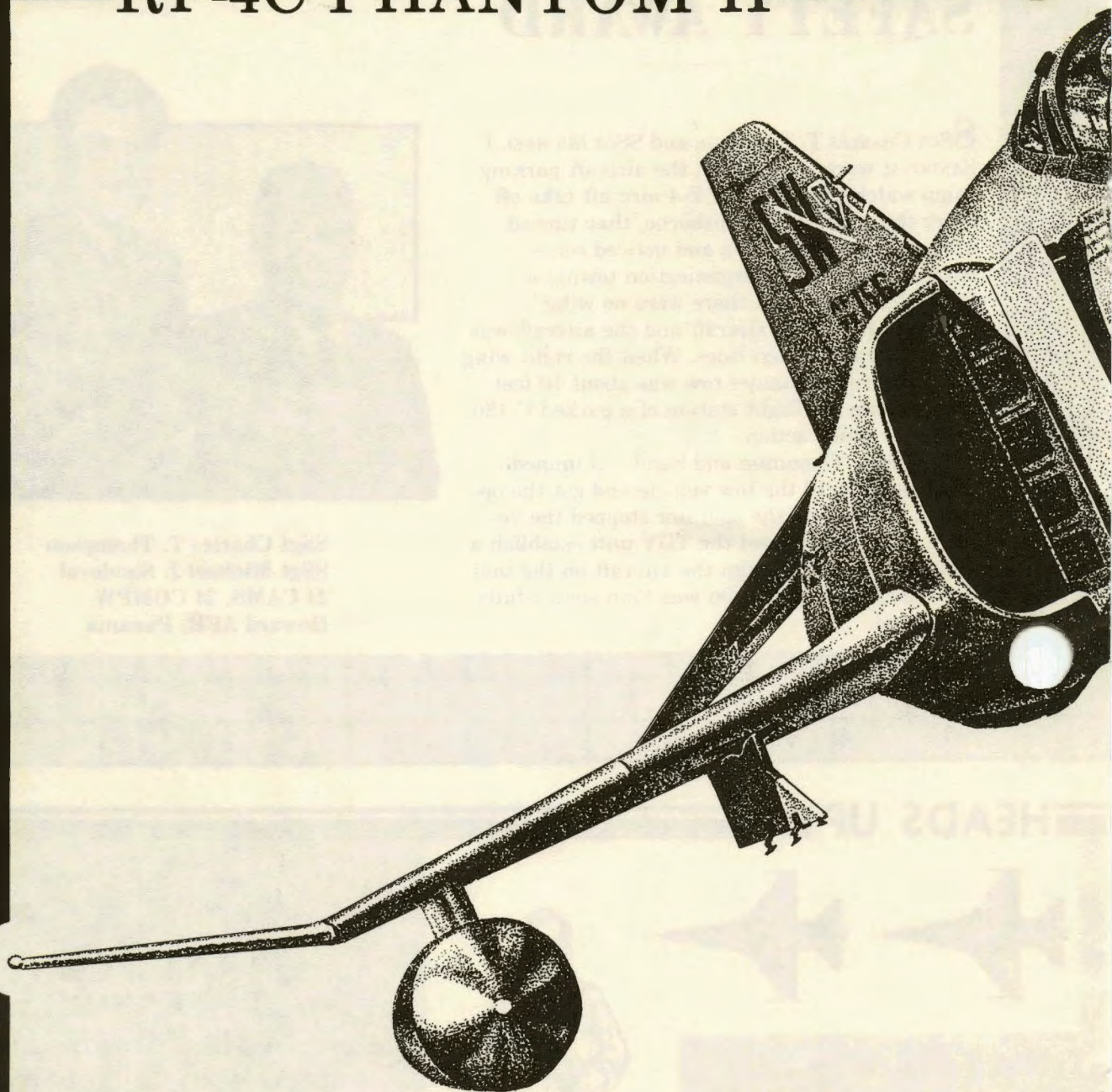
Next month in the  
**AUGUST**  
issue of *TAC Attack*  
you'll see TAC's  
1985 Air Losses  
IN THE CENTER.



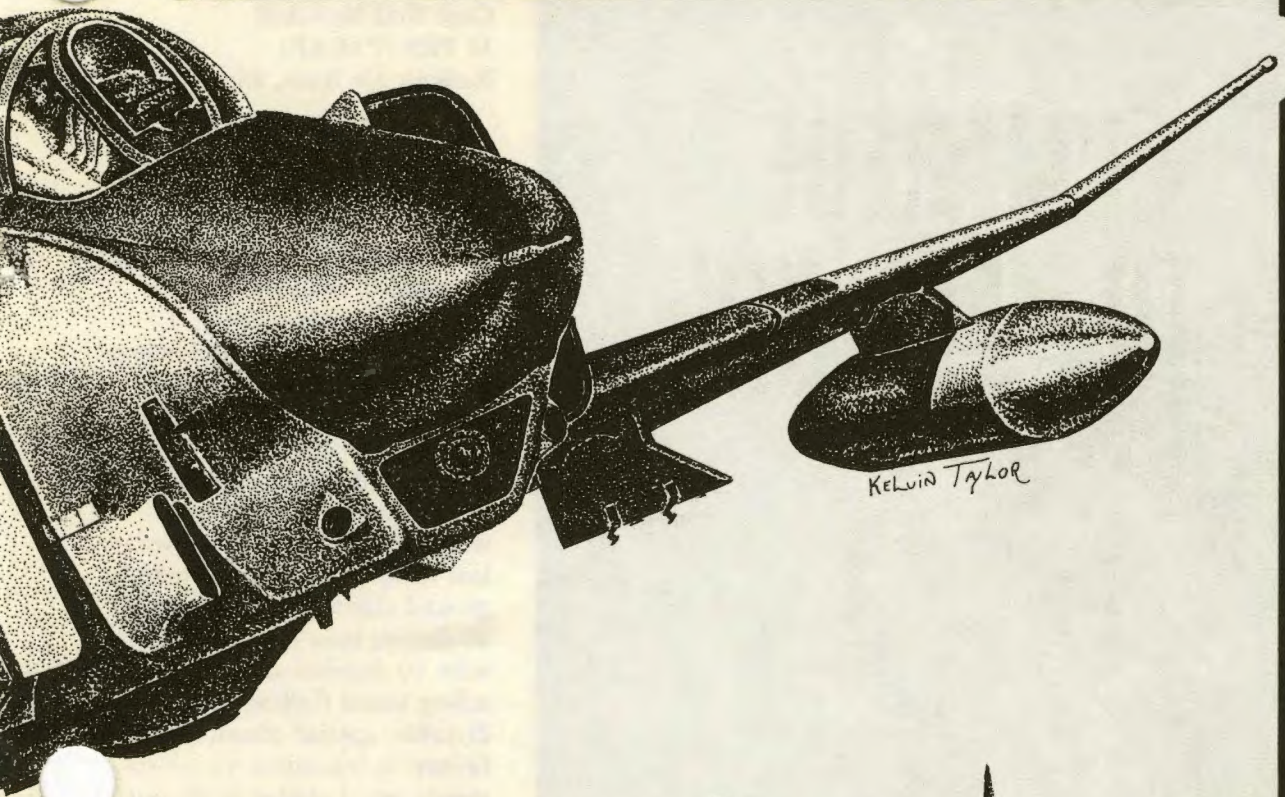
Coming IN THE CENTER  
of the SEPTEMBER issue  
is the A-7D Corsair II. But  
we need your help to find  
a suitable animal name-  
sake. Who can show us how  
to stipple a SLUF? It's  
worth a Fleagle T-Shirt to  
the firstest with the bestest.  
Our address is on page 4.



# RF-4C PHANTOM II









I'm here to tell you

# I'M HERE TO TELL YOU



Maj Allen McLellan and  
Capt Neil McAskill  
15 TRS (PACAF)  
Kadena Air Base, Japan

When I entered the squadron that morning, the *desk dog* told me about another safety read file item that I needed to read and sign off before my night mission. I opened the pubs file and began to read. The message was a familiar one: it seems another pilot rode his aircraft into the ground. On initial climbout, the formation entered the weather and number two went lost wingman. He impacted the ground shortly thereafter, in a 30-degree nose-low attitude with 60 degrees of bank. The safety board findings were predictable: spatial disorientation, failure to transition to instruments, etc. I signed it off and mentally filed it away with the hundreds of other, similar accident and safety reports I had read over the years. *Transition to instruments*, I thought, *that's the kicker. Got to believe those instruments.* That had been pounded into me as far back as basic pilot training.

Our mission that night was a practice tactical qualification check with a night air refueling. It was my third consecutive night sortie that week, and one which I approached with waning enthusiasm. The premission brief was routine. The weather was forecast to be VFR throughout the low-level flying area, but the visibility at the airfield was predicted to be 2 miles with fog. *No sweat.* I had every reason to believe that this would be just another routine RF-4C night radar rid



And why not? My tailgunner was an experienced WSO, an ex-SEFE with over 1,000 hours in the pit. I had just completed the instructor pilot upgrade and was confident in my ability to fly both the aircraft and the mission. We were both very familiar with the local flying area and procedures. We had flown together before and were comfortable with each other as a crew. There was absolutely nothing about tonight's mission that could increase my adrenalin flow.

It was a twilight takeoff. The visibility had begun to drop and was already down to 2 miles around the airfield. The night-refueling portion of the mission was uneventful. When we left the tanker, we discovered that we had a radar problem which prevented us from flying the tactical portion of the mission. We decided to return to base and fly approaches until we were light enough to land. We requested and were cleared for the high ILS penetration and approach.

I briefed the published approach procedure to my backseater and readied my cockpit for the descent. After the penetration, we turned off the arc and established ourselves on a 15-mile ILS final. At 12 miles, we configured for a normal approach. As the WSO read the stepdown altitudes, I concentrated on maintaining course alignment and prepared to intercept the glidepath. At 7 miles, with the before landing

checks complete, we started our descent—on-course, on-glidepath and on-air speed.

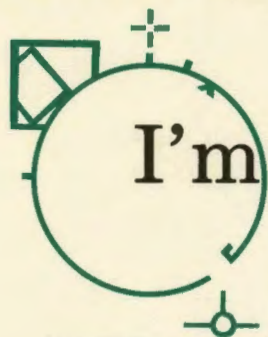
Passing 2,000 feet, we settled into a fog layer. About 4 miles out on final, I glanced out of the cockpit, looking for some visual cues to confirm that my instruments were accurate. When I looked out over the glare shield, I was overwhelmed with the sensation that we were climbing. I felt—no—I *knew* we were in a 30- to 40-degree nose high attitude, and that if we continued, the aircraft would ultimately stall.

This sensation was reinforced by the fact that all I could see out of the cockpit were stars above a downward sloping layer of fog. This fog layer completely obscured the horizon as well as any ground/sky references. The only ground references that I could see were the faint flickering of the runway sequenced flashing lights off in the distance.

I unconsciously released back-pressure on the stick and came back inside to my instruments. The aircraft quickly transitioned from on-glidepath to







# I'm here to tell you

well below glidepath. I remember crosschecking each of my critical flight instruments: the VVI was minus 2,000 fpm, the ADI read 5-degrees nose high, the altimeter was decreasing through 1,200 feet MSL, we were on course but at least two dots below glidepath. For the next few seconds (which seemed considerably longer), I struggled with what the data from the instruments were showing me and what every nerve in my body was telling me. I wanted to believe my instruments, but somewhere within the process whereby the brain absorbs data, analyzes it and sends instructions to the muscles to react to that data, the process broke down. I was unable to react. I continued trying to fight this mass of sensory confusion; finally, as the altimeter fell through 1,000 feet, I asked the WSO to "Take the aircraft." The pitter immediately came on the controls and started a go-around.

The aircraft started to climb after descending below 700 feet. My internal gyros began to stabilize as we climbed through the fog layer, and the horizon became visible again. I gang-loaded my oxygen regulator, took control of the jet, contacted approach and turned to our downwind heading. While on downwind, I tried to reconstruct what had happened and how it affected me. We contacted the SOF and told

him, as best we could, what had occurred and asked him to warn other aircraft of a strong visual illusion at 3 to 4 miles out on final. My WSO suggested that he fly the next approach while I monitored. This sounded like a good idea; it allowed me time to regain my composure and study the visual illusion in more detail. By monitoring this second approach, I was able to identify exactly when and where this illusion would take place. I flew the next approach, and then we came around for a full-stop landing. The illusion was so real that on each approach, even though we knew what to expect, we experienced varying degrees of disorientation. The difference was we were prepared for it.

It wasn't until I had landed

and talked to a physiologist that I fully understood what had happened. As we descended into the fog, the horizon disappeared and all outside references became either indistinguishable or distorted. It looked as though we were flying through a goldfish bowl. The distant runway lights, along with the sloping fog deck, combined to substitute for the true horizon. Because of the downward slope of the fog deck, I was able to see the stars out over my glare shield. All of these factors led me to believe, instantly and without a doubt, that I was climbing in a nose-high unusual attitude.

Whether or not you understand the details of this event, as I have described them, is unimportant. The likelihood that you will ever see these same





atmospheric conditions is probably quite slim. What is important is that you are aware of the power and reality of the visual illusion, so that when it's your turn in the barrel, you will be better prepared.

### Lessons Learned

*This can happen to you.* Like many of you I have been number four at night, in and out of the weather. I've battled the leans and overcome various types of spatial disorientation with the best of them. I've flown approaches down to category A minimums, failed to break out and had to go around. With each of these little successes my confidence has increased. I began to believe, perhaps as you might now believe, that I was less susceptible to the types of dis-

orientation which can lead to the disastrous results we've all read about in safety magazines and accident reports. Those of you who have experienced something like I've described in this article can relate to my story. For those who have not, my hope is that you will re-examine your beliefs about the power of the visual illusion.

*Familiarity breeds complacency.* During approach or any other critical phase of flight, our attention needs to be on the task at hand. During a penetration or on final is not the time to be filling out the 781 or thinking about anything other than the safe operation of that "mass of metal and JP-4" entrusted to you. Had this situation been compounded by an emergency or had my WSO not been ready to initiate a go-around, we may not have been here to write this article.

*Tell somebody.* The first person you should notify when something is wrong or doesn't appear normal is your pilot/WSO. Don't be afraid to speak up or take action if the situation dictates it. A sudden plunge to minus 2,000 fpm on the VVI, after being established on the glidepath, must be instantly challenged.

That night, there was another aircraft in the pattern flying approaches before we arrived. The pilot in this aircraft experienced the same visual illusion with frighteningly simi-

lar results. He too descended below glidepath and recovered approximately 2.5 miles out at 500 feet AGL. Had the crew thought about notifying the SOF or approach control of the visual illusion, we would have been better prepared to deal with it.

*Be prepared.* Remember, a visual illusion is just that. It is not a mirage in the desert or an aberration brought on solely by fatigue or other physiological factors. It is a set of atmospheric conditions which have and will cause aircraft losses and aircrew fatalities. All visual illusions will create some degree of spatial disorientation. The impact of this disorientation on the control of your aircraft will be affected by how well you are prepared, both mentally and physically, to deal with it when it happens.

### Epilog

I'd have to say that I am a better pilot now, after that experience. I've flown more night radar missions, in more fog banks, and hung on more wings in the weather. But I notice a more serious tone in my voice when I brief those special interest items, especially that particular item called spatial disorientation. I number myself as one of the fortunate to have experienced the power of the visual illusion and to be able to sit here and say, "I'm here to tell you."



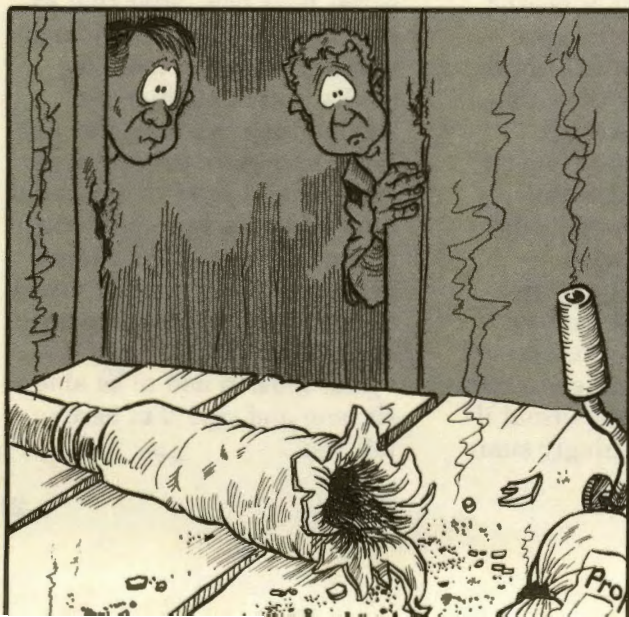


# WEAPONS WORDS

## Truth or consequences

An EOD team was out taking care of several rounds of unserviceable 30mm TP ammo. While destroying the ammunition, two of the workers agreed that a 30mm round would look pretty nifty mounted on a wall plaque. So they set one round aside and agreed to inert it later. Wonder how the disposal official certified that all the rounds were destroyed if they had one tucked away. Hmmm.

When the weekend rolled around, the twosome gave up cartoons and showed up in the shop. They drilled a small hole in the casing and poured out the propellant. Then they put the round in a vise and propped up a propane torch beneath it. They directed the flame against the primer and left the room, waiting for the pop. KABLOOIE! They got more than they bargained for . . .



The primer exploded with such force that it flew out of the primer pocket and punctured the propane cylinder. The propane exploded and touched off a fairly serious fire.

In our travels around the Air Force, most of us have seen 30mm souvenirs hanging around — on desks and I-love-me walls. And they're nice. I mean you don't have to go up to a guy who has one and ask him what he does for a living; his memento is trying to tell you. But AFR 127-100 prohibits inerting a live round for the purpose of making a souvenir. Period. So don't try it.

## Trailer hitch

Sometime during an alarm black of a local exercise, a munitions crew, working in the rain and wearing their full chem gear, was transferring some MK-20 Rockeye antitank cluster bombs from a storage area to an MHU-110 trailer. The trailer they were loading had just returned from carrying a load of CBU-58s. While prepping the trailer to carry MK-20s, the crew chief left the trailer's support rails in positions 5 and 6 where they were from hauling CBU-58s. Apparently, he didn't read the tech data as closely as he should have — the rails should have been switched to positions 5 and 7.

"Small potatoes in the heat of battle," you

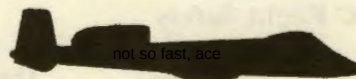




might say. In fact the omission was significant: as the MK-20s were being positioned on the trailer, one of the chock straps got hung up on the rail extender. Since the rails weren't right, the CG (center of gravity) was off and the bomb shifted forward and slipped off the trailer nose-post. That could be bad news — in combat as well as training for combat.

The heat-of-battle excuse doesn't hack it. We work hard to train our people to employ their wartime skills. We create conditions that are as close to combat as safely possible. We do all that because history shows people will fight the way they train. We're not going to toss out all the tech data when the balloon goes up. Let's not overlook it during exercises.

## NOT SO FAST, ACE —



**I**t's not our intention in the emergency situation training department to only present the school solution. Our objective is to give aircrews an emergency that has or can happen in a particular TAC aircraft and some solutions to consider. The limited space on one page often precludes an exhaustive list of options and explanations. You may have a better idea; and if you do, we hope you'll write and share your thoughts with the rest of us.

As some of us were reviewing Maj Jim Lee's good work on page 11, we wondered about another option — namely, why not tell the wingman to hang tight? He's already well aware of what's going on in your Hog and should be anticipating what's going to happen next — particularly if you give him a hand: tell him you're going through the boldface and to be prepared to

execute lost wingman/missed approach if necessary. He can reconfigure as you do, and in another 40 seconds or so, you'll both be VMC where he can circle or drag and land behind you.

Of course, this method of solving the equation requires you to count heavily on the weather being pretty pure underneath. But a recent weather update (required by AFM 51-37 before commencing the approach) would do that. And you'd need to have a good idea of your wingman's ability to hang in there. Let's face it, some guys might need to be sent around the flagpole. Maybe while you're going through the steps isn't the best place to decide which variety you were issued . . .

The point is, *first*, fly the aircraft, *then* execute the proper decision. Which one is that? It's your call, Ace.

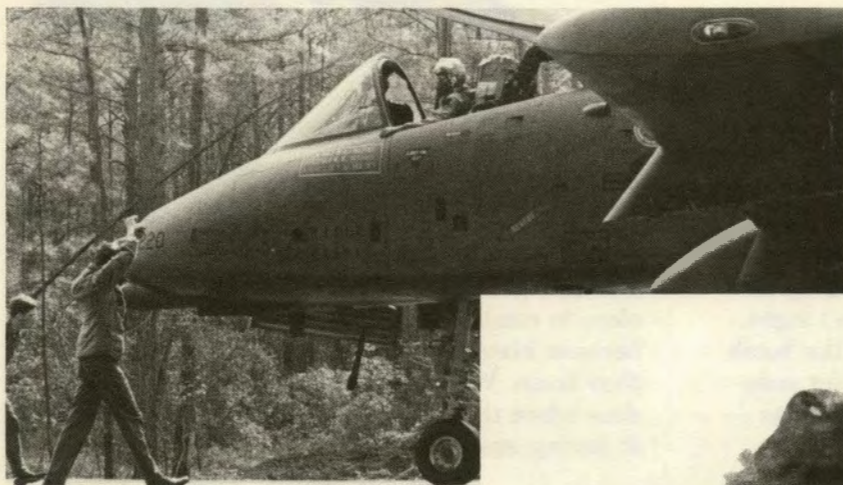




# ATTITUDE

Attitude First, you have to want to

## FIRST, YOU HAVE TO WANT TO



**Col Coupe De Ville**  
Chief, TAC Flight Safety

**M**any of us more . . . er . . . senior fighter pilots have a little fighter pilot philosophy—some of us a whole bunch—that we have used to keep the tradition of *fly & fight* in proper perspective. That philosophy is the basis for our commitment to being fighter pilots—commitment so strong that it carries the highest muzzle velocity—known to withstand ego drift, peer pressure bend, complacency drop, single-mindedness ricochet and things such as these.

During some of my recent trips to the trenches (trying to win a few quarters), I learned

that quite a few of our pilots today don't really have a philosophy per se. That concerns me. Because to develop the kind of commitment that enables a fighter pilot to withstand the trials of a peacetime force while he's preparing for combat, one needs a sound philosophy to build on. So I'm going to share three attributes of some sound Cajun fighter pilot philosophy.

A<sup>2</sup> is first. To be a fighter pilot—and anyone can be a fighter pilot, but first you have to want to—you must possess a strong positive ATTITUDE. If you want to be the best, you

need to take that same attitude and square it. So I call it A<sup>2</sup>. It's the attitude that reminds you day-in and day-out that after you strap on the jet, you are getting ready to do the most important thing in your Air Force career—fly.

It's A<sup>2</sup> that enables you to plan and learn on every flight. Some whiners have said, "Hell, Coupe, you can't expect us to fly every sortie like we were flying combat . . ." I check six with, "What are you gonna do in combat, Bubba, tell the Amarougians to stop hosing you so you can relax?" *If you hitch enough rides on de craw-*



*fish boat to cross de bayou because it's easier than swimming, you not only lose the skills of a strong swimmer needed when the floods come, but you begin to smell like de crawfish.*

You don't square the A automatically — it's something you have to work at every day. In combat, A<sup>2</sup> will make the difference. The guys with the whiskey-delta attitudes (ho-hum, just another tree-bustin' mission) don't last very long in combat when things turn to stink. We must prepare for the so-called routine like we do for the dirty-pinkos-are-trying-to-kill-me missions. And keeping the A squared helps us do just that. It's deadly on ego drift and complacency drop. But remember, to keep the A squared, **FIRST YOU HAVE TO WANT TO.**

The next ingredient is **SELF-DISCIPLINE.** Without it you won't produce a fighter pilot worth his JP-4. Discipline is the key factor you rely on in combat when you face the unknown. In the heat of battle, it's discipline that prevents you from rolling in unless you positively have the friendly positions. If I had to commit on any one trait, it would be discipline. Here again, you don't just inherit discipline when they pin on your wings. It's something you must work hard to obtain. And once attained, it's harder still to fight off the one factor that erodes discipline — complacency, the killer of young and old fighter pilots.

Top combat pilots in every era used discipline religiously, and they began developing it

during training at home plate. A true master of the art always knew the threat and the tactics to counter it. Why? Because during peacetime training he looked at the ROE as an aid to enhance his art, not as something that would tarnish his image as a fighter pilot.

The final ingredient is the **WILL TO WIN.** The will to win is the one thing that makes you work your buns off to improve. Most of us have a true will to win — every top gun does — but some of us concentrate on this one aspect so hard that we go GLC on the two previous ingredients. Will to win is essential in combat, but it's deadly if not tempered with attitude and discipline.

Everyone likes a winner, but

a winner by the rules. A cheater may win a few quarters on the range, but in combat he's gonna be gamblin' with wooden nickels. If he's on your wing, you lose; if he's your leader, you lose big time . . .

Do you have the light on the star yet? Hope I've started a few of you to think about what being a fighter pilot means to many of us *over-the-hill* troops. In peacetime, we need a strong basic philosophy to keep everything in perspective — in combat it's absolutely essential. We can keep smoking holes to a minimum if each of us formulates a philosophy based on attitude, discipline and winning — and if we fly like we believe it. But remember, first you have to want to. ➤





# DOWN TO EARTH

ITEMS THAT CAN AFFECT YOU AND YOUR FAMILY HERE ON

## Clip and save

### Hotel/Motel Fires

**Ask the front desk** what the fire alarm sounds like (some alarms sound like the phone and might not alarm you) and where the fire emergency plan is located (usually it's on the door of your room, but ask anyway).

**When you get to your room**, make sure everyone knows where the phone is and what numbers to call (fire, police and front desk — call in that order if there's an emergency and you have time). Designate a specific spot to place the room key and flashlight when you're in the room (preferably the night stand). Check out the windows in your room: can they be opened and is there a ledge or balcony you can jump from (from the third floor, there's only a 50-50 chance of survival; fourth floor and higher, forget it)?

### Plan ahead — know how to exit the building.

First, designate a meeting place outside the building. Then, locate at least two fire exits at opposite ends of the building. Count the number of doors and note other features (like drink or ice machines) between your room and the exits. Count on being in the dark, in smoke and crawling. Feeling your way out and knowing what to expect could save your life. Take a trip through the exits — they shouldn't be blocked, locked or held open. Note if the doors can be opened from the stairway, many can't: once you're in the stairway, you're committed to it. Follow the stair-

way all the way down. Find out if and where you exit the building or if you end up in the basement or lobby. Now follow the stairway all the way up. Can you exit out onto the roof?

### Please, Please, Please

- Teach your children to be self-sufficient in an emergency — they may have to save their own lives.
- Read the emergency escape plan that you find on the back of the door.





## THE GROUND the ground



- Never use an elevator.
- Always crawl — smoke is usually the killer. Avoid it at all costs.
- Always check out a commotion — it might not be a party.
- Don't hesitate to report a possible fire — better safe than . . .
- Always take the room key with you — you may have to return to your room if the exits are blocked.
- Close all doors behind you.
- Hold on to handrails in stairways — panicked people could knock you down.
- Don't break any windows unless rescue is immediate — smoke could enter the room from the outside.
- If your clothing catches fire, never run: drop and roll.
- Once outside, don't go back in. Go immediately to your designated meeting place.

## Why you're seeing more red

**Y**ou may have noticed an extra red light on the back of some 1985 cars. Next year, by order of the federal government, all 1986-model cars will be equipped with them.

The upper-level lights have been offered as a luxury item on some sports cars since 1970. But the government believes the lights will help reduce the number of rear-end accidents.

The National Highway Traffic Safety Administration estimates that there are 3.5 million rear-end accidents each year, causing about 600,000 injuries. The extra light could eliminate 40,000 of these injuries and save \$434 million in property damage.

The light is expected to add \$7 to the price of a car at first, then drop to \$4. You can buy the light for an older-model car at an auto parts store and install it yourself.

### NOTICE REGARDING POSSIBLE INSURANCE DISCOUNTS

You may be entitled to a premium discount on your automobile insurance after your collision avoidance light has been properly installed.

At the time this light was manufactured and packaged, several major insurance companies were considering a premium discount for each policy holder who installed a collision avoidance light, although none had as yet offered such a discount.

**THEREFORE, WE RECOMMEND THAT YOU CHECK WITH YOUR INSURANCE AGENT.**





**Children are out of shape.** A study conducted by the Amateur Athletic Union shows that American children are in poor shape. Tests of more than four million boys and girls, aged 6 to 17, showed that only 36 percent can pass basic physical fitness tests. In 1979, 43 percent could pass the test. The drop-off may be caused by the elimination of compulsory gym classes after eighth grade in many school districts.

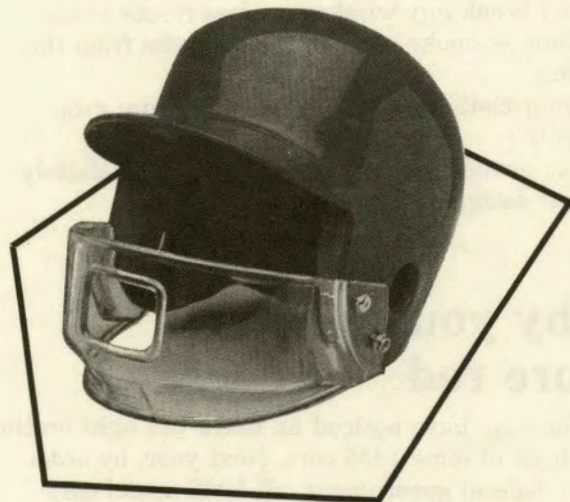
**If you're an insulin-dependent diabetic,** tanning booths, hot baths and saunas can accelerate your absorption of the previous insulin injection, causing the blood sugar level to plummet. Make appropriate dietary or insulin adjustments before you indulge.

**Sodium-labeling rules take effect this month (July).** All foods that make nutritional claims have to add sodium content: *sodium free* means fewer than 5 mg per serving, *very low sodium* is 35 mg or less per serving and *low sodium* is 140 mg or less per serving. *Reduced sodium* means the normal salt level has been reduced 75 percent; *unsalted* means the product used to be made with salt, now it isn't. Safe and adequate sodium intake is 1,100 to 3,300 mg a day.

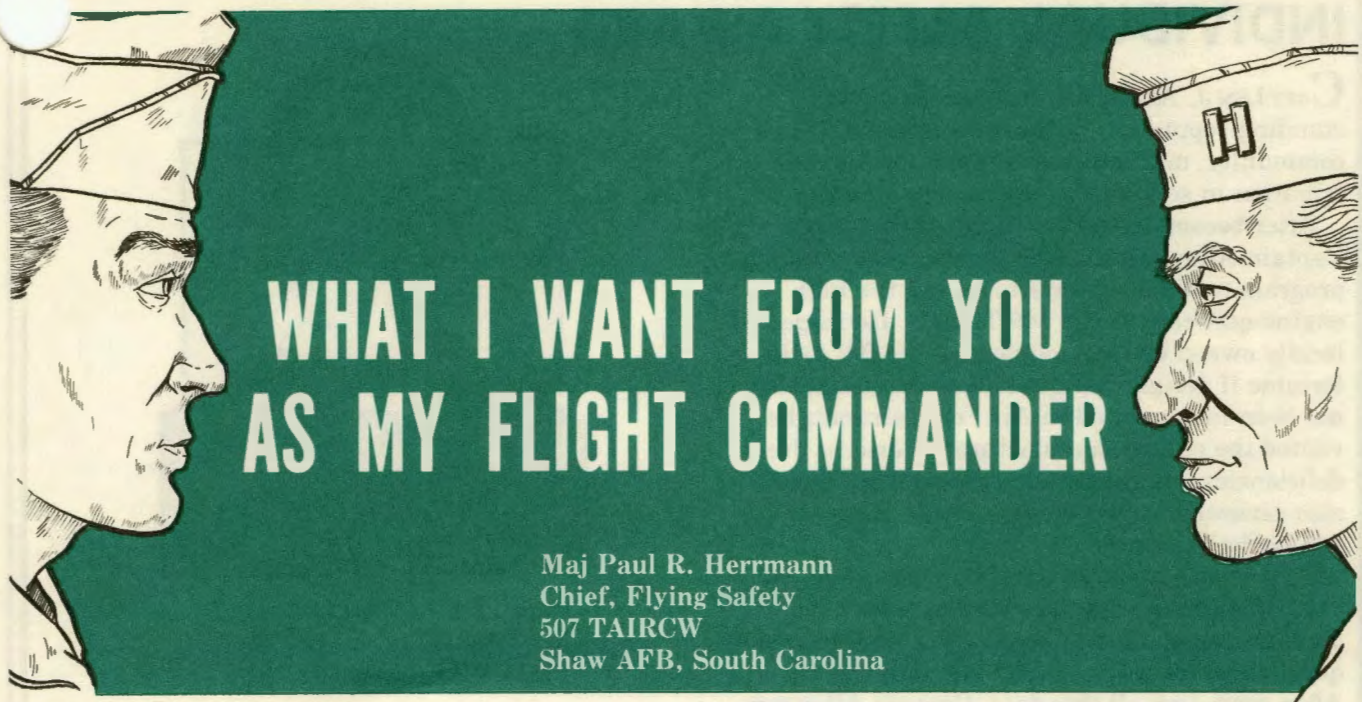
**So, you're going to drive to Timbuktu** over the 4th of July holiday weekend. Well, pace yourself: take a break every two hours and eat something. Researchers have found that eating food during a rest break improves driving performance. Avoid highway hypnosis — keep moving your eyes. Know the signs of fatigue: burning eyes, excess blinking, lights bothering you, driving slower or faster than you thought you were going.

**Rego LP gas regulator product recall.** All Rego Model 210 LP gas regulators should be immediately removed from service. They may be found on any recreational vehicle, mobile home, travel trailer, park trailer, fifth-wheel trailer, truck camper, van conversion, outdoor grill or home where LP gas is used for heating or cooking. Without warning, any Rego Model 210 regulator may suddenly experience a mechanical failure which could result in a fire or explosion. There is no way to predict this failure. Please call the Rego Company at 1-312-685-1121 for a free replacement.

**Little League Baseball Inc.** recommends all children wear baseball face masks. Baseball accounts for more children's eye injuries than any other sport. The preferred mask is transparent and attaches to a batting helmet, guarding a player's eyes and face from injury.







# WHAT I WANT FROM YOU AS MY FLIGHT COMMANDER

Maj Paul R. Herrmann  
Chief, Flying Safety  
507 TAIRCW  
Shaw AFB, South Carolina

**F**rom 2nd Lt Newguy.

First, and maybe most obvious, maintain technical competence in your flying skills. I will be depending on you to know your job, in depth, as an expert. Teach me what I need to know, but don't do it only as problems arise—as a part of a firefighting process. Do it on a systematic and regular basis as a part of our relationship right from the first day we begin to work together.

Be aware of your own limitations and don't try to snow me. You will probably be able to get away with it for a while. But when I do catch you, as I inevitably will, you're going to lose the one thing that our relationship can't really exist without—credibility. It's much better to admit being wrong or even ignorant about a situation than to try to take it through when you know you're over your head. Simply put, I can handle the knowledge that you don't know everything much better than I can handle the knowledge that I can't fully trust what you tell me.

Talk to me. A lot. Orders are the least effective way of getting things done in any endeavor, because personal commitment is the key ingredient that makes for success in any effective organization. Always remember that what you say is really no more important than how you say it.

Be skillful in your advisory role. Develop the

sense to distinguish between situations that require you to simply delineate issues for your boss and those that require you to take an advocacy role, ranging from a simple recommendation to a ringing insistence. I've noticed that the officer who is continually excited about the issues at hand, who is always outraged, upset, angry or absolute can't possibly be as effective in the long run as the man who knows how to vary his pitch according to the needs of a particular situation. Likewise, the leaders I admire most realize that they don't have to win every contested point in order to be successful; they save their "big guns" for the times they're needed most.

Be loyal. Be charitable of my faults and don't play the big man by cutting me down to your peers, tempting as that may be. Criticize me face-to-face when necessary, because it's really one of the services I need from you.

Don't keep me in the dark. Be sensitive and tuned in to my need and my desire for detail. Keep me informed, but don't overload me with so many details and worries that I lose sight of the overall picture.

I hope that at least a few of these suggestions will strike home and by doing so help us do a better job for the Air Force.



# TAC SAFETY AWARDS

## INDIVIDUAL SAFETY AWARD

**C**APT LEM J. ALLEY, JR., has earned an outstanding reputation in the 0-2A (Cessna 337) community, military and civilian, for his contribution in solving the engine-quit problem.

After becoming the 0-2 flight safety officer, Captain Alley initiated an independent research program to discover ways to reduce the high engine-quit rate in the 549 TASTG. He inspected locally owned civilian versions of the 0-2 to determine if design changes had occurred that had not been incorporated in Air Force aircraft; he visited the engine manufacturer to discuss design deficiencies and examine technical data; and he also reviewed earlier studies by the Kelly AFB Air Logistics Center.

To gather additional data, Captain Alley developed a survey that was sent to over 1,200 civilian owners of the Cessna 337. More than 600 questionnaires were completed and returned. After compiling all this data, Captain Alley concluded that vapor in the fuel line to the engine-driven fuel pump was the probable cause of the problem. He then made a modification proposal to TAC which has been approved and will be tested soon.

During his research, Captain Alley recom-



**Capt Lem J. Alley, Jr.**  
549 TASTG, 507 TAIRCW  
Patrick AFB, Florida

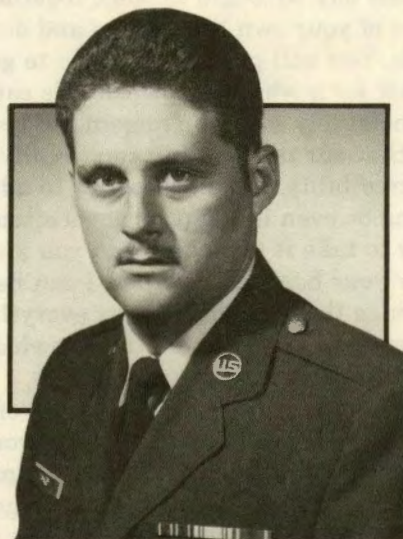
mended changing the frequency of the engine conditioning inspection from every 100 hours to every 50 hours. Because of this change, fuel-flow adjustments are being made more often and have resulted in a 78-percent reduction in engine-quits, from 18 in 1982 to only 4 in 1984.

## CREW CHIEF SAFETY AWARD

**D**uring a thru-flight inspection of his T-33A aircraft, SRA SCOTT A. WHALEY noticed the static ground receptacle by the aileron on the top of the right wing was missing. Airman Whaley searched all accessible areas in and around the aircraft for the missing item without results.

Instead of assuming the receptacle had been lost in flight, Airman Whaley had the aileron removed to search the wing's interior. The search revealed the receptacle had stuck in the aileron bellcrank. Airman Whaley retrieved the old receptacle and properly installed a new one. He had the aileron reinstalled, and the aircraft made its next scheduled flight on time.

Despite the pressure to launch the aircraft on time, Airman Whaley took his time and checked out other possible solutions. His actions set a good example of safety awareness and prevented a serious mishap from occurring.



**SRA Scott A. Whaley**  
325 AGS, 325 TTW  
Tyndall AFB, Florida



# TAC TALLY



|                      |
|----------------------|
| CLASS A MISHAPS      |
| AIRCREW FATALITIES   |
| TOTAL EJECTIONS      |
| SUCCESSFUL EJECTIONS |

| TAC |          |      |
|-----|----------|------|
| MAY | THRU MAY |      |
|     | 1985     | 1984 |
| 3   | 9        | 9    |
| 3   | 6        | 9    |
| 1   | 7        | 5    |
| 1   | 6        | 3    |

| ANG |          |      |
|-----|----------|------|
| MAY | THRU MAY |      |
|     | 1985     | 1984 |
| 1   | 5        | 3    |
| 0   | 2        | 2    |
| 2   | 5        | 2    |
| 2   | 5        | 2    |

| AFR |          |      |
|-----|----------|------|
| MAY | THRU MAY |      |
|     | 1985     | 1984 |
| 0   | 0        | 0    |
| 0   | 0        | 0    |
| 0   | 0        | 0    |
| 0   | 0        | 0    |

## TAC'S TOP 5 thru MAY 85



| TAC FTR/RECCE              |         |                              |
|----------------------------|---------|------------------------------|
| class A mishap-free months |         |                              |
| 34                         | 405 TFW | (F-15, F-5)<br>Luke AFB, AZ  |
| 28                         | 1 TFW   | (F-15)<br>Langley AFB, VA    |
| 27                         | 33 TFW  | (F-15)<br>Eglin AFB, FL      |
| 25                         | 23 TFW  | (A-10)<br>England AFB, LA    |
| 25                         | 366 TFW | (F-111)<br>Mtn. Home AFB, ID |

| TAC AIR DEFENSE            |         |                              |
|----------------------------|---------|------------------------------|
| class A mishap-free months |         |                              |
| 148                        | 57 FIS  | (F-4)<br>Keflavik, Iceland   |
| 101                        | 5 FIS   | (F-15)<br>Minot AFB, ND      |
| 98                         | 48 FIS  | (F-15)<br>Langley AFB, VA    |
| 57                         | 318 FIS | (F-15)<br>McChord AFB, WA    |
| 48                         | 87 FIS  | (F-106)<br>KI Sawyer AFB, MI |

| TAC-GAINED FTR/RECCE       |         |                                |
|----------------------------|---------|--------------------------------|
| class A mishap-free months |         |                                |
| 157                        | 188 TFG | ANG(F-4)<br>Ft Smith, AR       |
| 149                        | 138 TFG | ANG(A-7)<br>Tulsa, OK          |
| 148                        | 917 TFG | AFR(A-10)<br>Barksdale AFB, LA |
| 126                        | 114 TFG | ANG(A-7)<br>Sioux Falls, SD    |
| 115                        | 183 TFG | ANG(F-4)<br>Springfield, IL    |

| TAC-GAINED AIR DEFENSE     |         |                                 |
|----------------------------|---------|---------------------------------|
| class A mishap-free months |         |                                 |
| 131                        | 177 FIG | ANG(F-106)<br>Atlantic City, NJ |
| 97                         | 125 FIG | ANG(F-106)<br>Jacksonville, FL  |
| 80                         | 119 FIG | ANG(F-4)<br>Fargo, ND           |
| 64                         | 107 FIG | ANG(F-4)<br>Niagara Falls, NY   |
| 55                         | 147 FIG | ANG(F-4)<br>Ellington AFB, TX   |

| TAC/GAINED Other Units     |          |                                  |
|----------------------------|----------|----------------------------------|
| class A mishap-free months |          |                                  |
| 190                        | 182 TASG | ANG(OA-37)<br>Peoria, IL         |
| 174                        | 110 TASG | ANG(OA-37)<br>Battle Creek, MI   |
| 170                        | USAFTAWC | (many fighters)<br>Eglin AFB, FL |
| 162                        | 84 FITS  | (T-33)<br>Castle AFB, CA         |
| 104                        | 552AWACW | (E-3, EC-130)<br>Tinker AFB, OK  |

## CLASS A MISHAP COMPARISON RATE

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

| TAC | 1985 | 3.2 | 3.4 | 2.7 | 2.4 | 2.9 |  |  |  |  |  |  |  |
|-----|------|-----|-----|-----|-----|-----|--|--|--|--|--|--|--|
|     | 1984 | 3.4 | 4.3 | 3.3 | 2.5 | 2.9 |  |  |  |  |  |  |  |
| ANG | 1985 | 4.8 | 4.8 | 3.0 | 4.5 | 4.5 |  |  |  |  |  |  |  |
|     | 1984 | 0.0 | 2.3 | 1.5 | 2.2 | 2.6 |  |  |  |  |  |  |  |
| AFR | 1985 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |  |  |  |  |  |  |
|     | 1984 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |  |  |  |  |  |  |  |

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC



SURE IS DARK AN' BUMPY  
IN HERE. MUS' BE GETTIN'  
READY T'LAY DOWN  
SUM THUNDER  
AN' LIGHTIN'.



MAYBE I CAN  
OUTRUN THIS SUCKER.



THEM CLOUDS  
UP AHEAD LOOK  
SOFT AN' FLUFFY  
ENUFF.



I HATE  
HAIL.



I HATE  
LIGHTNING.



I HATE  
CRASHING.

