

# TAC ATTACK

JUNE 1985

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SEP			

State of mind,  
appropriate for the task?



# TAC remembers General Jerome F. O'Malley

In the glare of tragedy that touched us all on 20 April 1985, we tend to search for some explanation, some comfort to reconcile the monumental loss of General and Mrs. O'Malley. There are, of course, no explanations; however, in the final hours of his life, General O'Malley bestowed an instructive legacy to all of us.

On Saturday, 20 April 1985, General and Mrs. O'Malley returned from a trip that had included a visit to Mountain Home Air Force Base, Idaho. They had about two hours ground time at Langley before they were scheduled to depart for Scranton, Pennsylvania.

Mrs. O'Malley was resting upstairs while General O'Malley and I sat at his dining room table; he began to reflect back on the aircrew meeting he had attended at Mountain Home. He was very pleased that one crew member there had brought up the subject of the *Warrior Leader* and the necessity to teach each generation about *Warrior Leader* with the same emphasis given to other forms of professional education. General O'Malley agreed and, after sharing several of his personal experiences, summed up with this observation:

We have many warriors. Many who can excel when the challenge is small or the victory certain. But the *Warrior Leader* is more. He is the one who, having suffered heavy losses, can inspire the same people to want to go back. That is a very rare quality.

And then General O'Malley said:

I want to make sure I emphasize the importance of the *Warrior Leader* whenever I talk to the aircrews.



The opportunity to hear those words directly from him is gone, but the lesson remains—and we can be comforted that one of his last thoughts concerned the heart and soul of our business.

JOHN JUMPER, Lt Colonel, USAF  
Executive to the Commander

John Jumper, Lt Colonel, USAF



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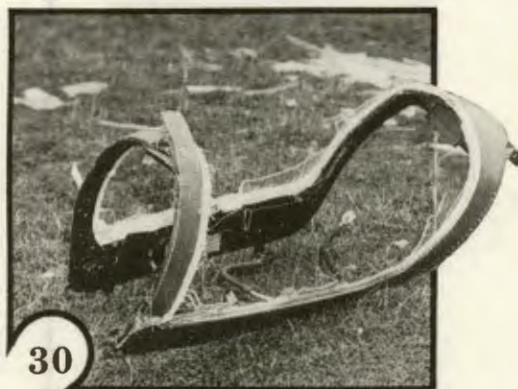
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## TAC ATTACK

JUNE 1985



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# LETTERS

OUR

Dear Editor

It's a shame that your many great articles on safety and emergency procedures seldom mention the existence of the flight simulator. There are many of these multimillion dollar toys being lovingly cared for and waiting to be used. True, they are not perfect machines, they are but tools to be used. They are tools that can be of great use in preparing for those situations we hope never happen. Where else can you practice an engine seizure, a complete hydraulic or electrical failure. The uses for these tools are only limited by the imaginations of the users. Perhaps the most important advantage of the simulator is that when it crashes, the aircraft and crew survive.

Norm Paskey, WG-12  
Flight Simulator Technician  
115 CAMS  
Truax Field, Madison, Wisconsin

Dear Editor

Reference your F-4 Emergency Situation Training on page 26 of the March issue of *TAC Attack*, I think the article, while food for thought, backed us F-4 drivers into a common error corner by deciding too quickly to divert at all. A better answer, I think, would have been to slow things down by following the basic steps in any aircraft

emergency:

1. Maintain aircraft control. Climb, knock it off and
2. Analyze the situation. Now consider the severity of the malfunction, weather, fuel remaining, aircrew proficiency, divert field capabilities and familiarity, and so on.
3. Land as soon as practical.

A quick look at page E-28 of my F-4G checklist shows that the first step for a simple utility hydraulic failure is to land as soon as *practical*. It is not akin to engine or electrical fire, bleed air duct failure, or double generator failure—all of which require landing as soon as *possible*.

Your article didn't have all the data necessary to go through the above analysis process, but if the guys were 200 NM from home (at treetop level), it seems reasonable that they are near bingo fuel. Assuming worst case, 5,500 pounds of fuel remaining, I'd now jump into the checklist diversion charts to see how far double-ugly would fly (no wind, standard day, various configurations, etc.). Assuming a drag index of 30, even with the gear down, she'll go 253 NM and touch down with 1,000 pounds of fuel remaining. Gear up she'll get you about 388 NM with the same reserve. So why rush for the divert base?

The basic pneumatic system is



## TURN TO TAKE FLAK



designed to lose not more than 300 pounds per hour with the air compressor out. The emergency accumulator bottles shouldn't lose any; but, worst case, they will contain at least what you read in the cockpit. So if there are no other indications of problems, I would leave the gear down and head for home. I'd use 25 minutes en route to get my sierra together for the impending AEBE—which would now be at the familiar home 'drome in clear weather. I'd keep a wary eye on the pneumatic pressure, but knowing I could lower the gear at any time and still make it would be reassuring.

One can *what-if* any situation, but the thing I've seen time and again get folks into trouble is a combination of not knowing their aircraft and rushing an emergency situation. Everyone's first reaction should be to slow things down.

Lt Col Gary S. Olin  
563 TFS/Operations Officer  
George AFB, California

Dear Lt Colonel Olin

*Thanks for your good thoughts. We certainly share your views on systems knowledge and winding the clock.*

*In the situation emergency training department that we run each month, our objective is to stimulate discussion and "what-would-I-do-if-*

*I-was-driving" thinking. We don't pretend to have the school solution.*

*Your solution was sage for a simple utility hydraulic failure. But we wanted to also crank in another complication—dwindling oil pressure. As it turned out, if you were in the middle of that long trip home and had to shut down an engine, you would be in worse shape. But who could predict that?*

*Deciding not to drive home with utility failure because there is a slight possibility you might have to shut down an engine is not the message we're trying to send. But neither is shying away from a trap at an unfamiliar base just because the weather is less than optimum.*

ED

Dear Editor

You were correct in your article "Into the Wind" in your December TAC Tips. It is correct procedure to roll onto your back and release if you find yourself being dragged face-down after PLF (IAW TO 14D1-2-1, para 3-32).

The technique taught at Water Survival works fine for water drags but not on land. If on land, to recover from a face-down drag it is best to roll over and then actuate the canopy releases while still face down. Also, once on your back the parachute pack/harness will provide

some protection from the ground. Further, your backside is much more able to absorb punishment from dragging than the other side. Exposing your face, abdomen, etc., to the ground during a drag could certainly result in serious injury.

While releasing from a face-down ground drag without rolling over (Letters, March 85) may be an



obscure technique, the correct procedure is to roll onto your back. In any case, however, it is imperative to effect an immediate release from the canopy if being dragged. There are several documented instances of fatalities from dragging; wouldn't that ruin your day to eject safely from your crippled jet only to be injured while being dragged.

Capt Jeffery A. Cramer, USAF  
OIC, 64 FTW Life Support  
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# Information Processing and You

**Lt Col Stan R. Santilli**  
**Chief, Human Factors**  
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A single-seat pilot churning along in a scud layer suddenly noticed a Fire light; at the same time, he felt a blast of hot air from the ECS. Intuitively compelling indications of a fire, right? Yet many more empirical instrument indications, never attended to, suggested there was no fire; and the pilot ended up ejecting from an airworthy jet.

The crew of a multiengine aircraft had been shooting instrument patterns around the flagpole for about four hours, practicing engine-out approaches and other emergency situations. The workload was

not unduly high, the weather was good, the aircraft was performing normally. However, on the full-stop landing, despite years of training and despite at least three normally operating warning systems, the crew failed to extend the gear. Upon egressing the aircraft after an unusually short roll out, the crew was surprised that the gear were still in the wheelwell.

Both of these mishaps have as their root cause the limitations and idiosyncrasies of how we process information. Knowledge of how we think and how our built-in limitations can get us into trouble may enable pilots to fly safer and more effectively. That is the purpose of this article.

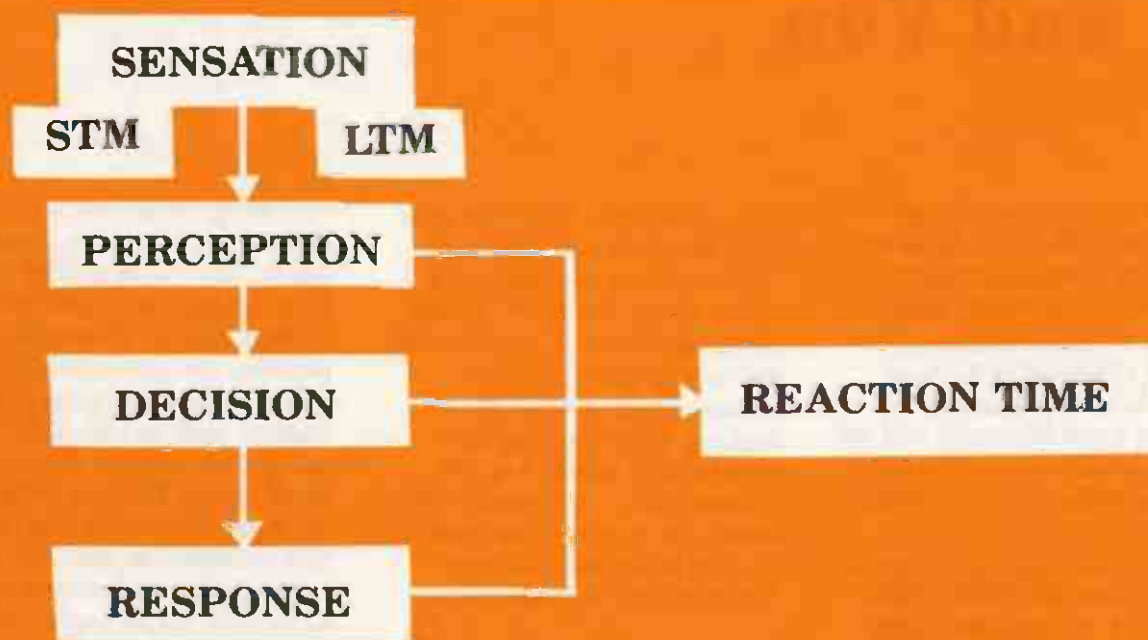
Before we explore how the mind works, first let's admit that we really don't *know* how the mind works. No theory or model has been adequate to explain the complexity and flexi-

bility of how we think. When it comes to explaining logic, imagination or abstraction, we do not have a comprehensive answer about what all goes on between our ears. Much of what will be used to explain these are called hypothetical constructs; in other words, we don't really know what makes it work, but after watching it a lot, its operation can be explained in terms of other things that we do understand, even though they really aren't the same. So, many of the explanations offered are descriptive rather than explanatory and are borrowed from several theories on cognition and information processing that best describe operationally how we receive, manage, store and retrieve information.

## **The process**

First, let's look at the basic model of how we process information.





Information about the world around us is constantly being gathered by our five senses of sight, smell, taste, touch and hearing. Orientation information is also constantly being collected. This process of *sensation* can be thought of as a gathering of raw data. As these raw data are detected by the sensory systems, given that their quality and quantity meet certain criteria necessary for their detection, they are first recorded in sensory register. Information recorded here is thought to decay very rapidly, as fast as .5 seconds. What preserves this information is conscious attention.

Since there is so much sensory information available at any given time, it is impossible to process all of it. Indeed most it is not important enough to process at all. If a given put is deemed significant, and attended to depending on

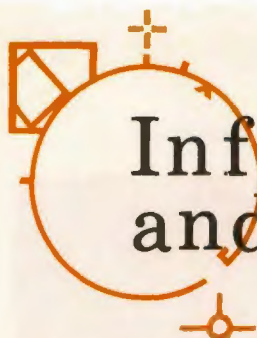
our priorities at the time, then it moves to *short-term memory (STM)* where it can remain for about 5 to 15 seconds, after which it too will decay. It is in STM where sensory information coming in is usually processed. For this information to reach *long-term memory (LTM)* requires rehearsal and integration with previous knowledge. For example, the sensory register may record a yellow page with black printing on it. After attending to it, STM records that it is a checklist with words on it. Since we have been instructed to commit these words to memory, we begin to process the information contained in these words and integrate them with what we already have stored in LTM. After sufficient rehearsal, this new information is also stored in LTM. Thus the new information, HANDLES RAISE, TRIGGERS SQUEEZE, be-

comes part of our knowledge base.

The second step in processing information is *perception*. This refers to the conscious process of attaching meaning to the new data that has been attended to. This involves assessing what the new information has to offer in terms of what other information is available in STM, what is stored in LTM, and what our motivation and activity is at the time. To continue the previous example, sensation may provide us with the information of rising EGT, a steady red light in the fire handle, vibration, smoke and flames coming from the engine. Perception translates all of this as meaning an engine fire.

That brings us to the third step of information processing, the *decision* step. Having perceived what is occurring, decision has to do with deter-





# Information Processing and You

mining its significance and what should be done about it, if anything. Drawing on past experience and training stored in LTM and considering other incoming information such as altitude, airspeed, number of engines available (one!) and the gliding characteristics of your jet (manhole cover), you decide that an engine fire requires ejection. The procedure "RAISE HANDLES, SQUEEZE TRIGGERS" is recalled from LTM.

The last step of information processing is to commit to and initiate a *response*. The time from the perception step to the response step is generally referred to as "reaction time" and if the information to be processed is simple and clear, and the response is well ingrained in LTM, then this may occur as rapidly as .3 seconds (simple reaction time). However, if the information to be processed is complex, or several responses are possible and must be weighed, then reaction time may be 3–6 seconds (complex reaction time). Furthermore, if the perception process is compromised by conflicting data, or inability to attach meaning to the new information, or if an appropriate response is not stored in LTM, or if other factors (discussed later) interfere, then no decision or response may be made at all. The result: reaction time is indefinite (delayed ejection—fatality).

To summarize the basic process: we sense raw data (sensation), attach meaning to it (perception), determine its significance (decision) and initiate the appropriate action (response) which may be to do nothing. This whole process may be very rapid, it is continuous and it is dynamic. Furthermore, it sometimes doesn't go well for various reasons which will be discussed next.

## To process or not to process

Now let's discuss two factors which greatly determine *if* information is processed at all and if so, *what* information is processed—these are *level of awareness* and *level of attention*.

Level of awareness refers to the cognitive level at which mental activity is taking place. These may be the conscious level, preconscious level or subconscious level.

The *conscious* level is where active thinking takes place. It is where we use inductive and deductive reasoning, make decisions, direct our voluntary activities and ponder great questions such as "Where's the beef?"

The *preconscious* level, on the other hand, is more passive in nature. It is the repository of short- and long-term memory and the many overlearned habit patterns that we have acquired through repetitious practice since childhood. These

may range from how we tie our shoes (I've seen some interesting variations) to routine sequences such as procedures for a touch-and-go. Preconscious patterns are stored in LTM along with other useful information, such as our address and phone number. Like anything else in LTM, in order to have gotten there it had to be first attended to and then rehearsed over and over in order to become deeply ingrained. Some relatively simple behaviors, such as riding a bicycle, may last many years without rehearsal. Others that are more complex and require finer motor skills, such as typing without looking at the keys, need occasional rehearsal to retain them in LTM.

Any activity that requires active information processing or decision-making, must take place at the conscious level of awareness. The preconscious level maintains a passive watch on what's going on around us, but only alerts the conscious level by exceptions to our expected environment, such as a loud noise or sudden bright light. These characteristics of the conscious and preconscious levels of awareness become important in attempting to explain many of the so called "dumb" accidents in which an airworthy aircraft is flown into the terrain.

Whereas the conscious and preconscious levels of aware-





First is *span of attention*. This refers to an individual's total capacity to attend at the conscious level. It is comprised of both *how much* information can be handled and *how long* it can be attended to. Typically we can attend to seven stimuli in a time-sharing, serial fashion rather than all at the same time since we can only think of one thing at a time. The duration of the span of attention is also an individual quality which may be influenced by innate capacity, fatigue, drugs, level of practiced self-control and other factors. Both the quantity and duration of an individual's attention span can be increased with specialized training.

*Focus of attention* refers to that portion of a person's span of conscious attention that is being used at any given time. Some activities require more attention than others and may not necessitate one's full span of attention to perform. For example, adding a list of single-digit numbers is a relatively unchallenging mental task which does not require our full mental capacity. That part which it does require, while in the process of doing it, is the focus of attention at the time. Similarly, running the after takeoff checklist and checking in with center and monitoring engine instruments while navigating typically does not exceed a pilot's span of attention and

is able to be handled by available focus of attention.

While juggling all that, whatever conscious attention is left is referred to as *margin of attention*. When the necessary focus of attention required to perform a task or tasks exceeds a person's span of attention, then he is said to be cognitively task saturated. So, it can be seen that assessing multiple major emergencies while performing the duties in the last example may leave no margin of attention and something has to drop out. Sometimes this something is keeping the airplane out of the mud.

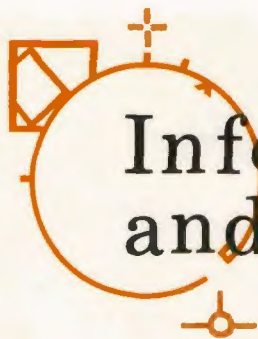
#### What else can go wrong

- Although a lot of information is constantly being received by sensory register, only that which is attended to at the *conscious* level can be actively processed. The *pre-conscious* is nevertheless keeping a listening watch on that which is ignored or has been discarded by the conscious. This allows us to be alerted to gross changes in our environment while our focus of attention is on only a small part of it. But if the preconscious is not primed to be watching for something, or the change in our environment is not great, then significant cues may be ignored because the pre-conscious is not in the business of deciding what is important or relevant. Thus the per-

ness often interact and are relatively well understood, the subconscious level (the realm of dreams, reflexes and other unlearned behavior) is little understood. Since most behavior can be explained without it, this level of awareness will not be further addressed.

Another important concept is attention level. This refers to the degree to which the conscious level of awareness is being used. This capacity varies from person to person and also can vary in an individual if influenced by such factors as fatigue or drugs. There are three levels used to describe the various levels of conscious attention.





# Information Processing and You

ception step may be obviated because of limitations of the preconscious in assessing significance of cues that the conscious can only attend to one at a time.

- Besides the quantity of information causing us problems, the quality of information available can also modify the process. Sensory cues are sometimes ambiguous. For example, in some aircraft a flashing Fire light means an overheat condition; in other aircraft a flashing Fire light has no prescribed meaning and would require conscious attention just to interpret the unexpected raw data.

- Training and experience are very important modifiers of information processing. Many things can go awry here, ranging from not having the knowledge at all, to having contradictory knowledge, to not having sufficiently rehearsed it to keep it in long-term memory.

- Another modifier of the process is the very way the mind consciously handles information. Every event or thing in our environment is made up of smaller events or things that form *patterns*. The mind is adept at recognizing those patterns, thereby defining the particular event or thing. Often some of those features are missing, but enough may be present to satisfy the mind and thus identify a thing or event

which in reality is not there or has not occurred. A good example is a backseater in an F-4 who was monitoring his wingman on a formation landing. In the flare there were many cues that formed the pattern in his mind of a normal wing landing—the approaching runway surface, the appearance of runway markings, smoke from the wingman's initial tire contact with the runway, etc. In fact, the wingman's right main tire had touched down seven feet off the runway. There were sufficient parts of the normal pattern to establish the landing experience and the backseater thus knew the landing was normal despite the physical

evidence which proved otherwise.

- Expectancy or set also is a potent modifier of information processing. This may affect the perception or response steps, and so we have *perceptual sets* and *response sets*. Both involve preconceived notions; the first about the information that is being sensed and the second about what is the appropriate response to that information. A set may result from continued reinforcing experiences in which "A" has always followed "B" and therefore is expected to do so all the time, or from information received from a reliable source that predisposes one to believe that an event





will occur or a thing will be there. An example of a perceptual set was demonstrated in a recent gear-up landing, in which on short final tower advised the pilot to check gear down. The pilot later stated that he saw the gear handle down and three green position lights. What he saw was what he expected to see because he had always seen it before at that point on final.

A response set can similarly result in errors. A pilot had diligently studied a departure plate and had it committed to memory, including the right turn at eight miles DME. At eight miles, departure control called and requested a left turn

for traffic. The pilot promptly turned right, nearly hitting the traffic that departure was trying to vector him away from. His response set was for a right turn, no matter what the initiating cue, and it nearly cost him his life.

● Another factor which can influence, or even obviate, information processing, is preconscious *habit patterns*. Especially in high workload situations, routine patterns of behavior are often relegated to the preconscious for implementation, sometimes inappropriately. This accounts for many of the situations in which an incorrect control or switch was activated because the pilot

was used to it being in that location in an aircraft he had flown recently or for a long period of time. This is called proactive inhibition and is commonly referred to as habit pattern interference.

### Conclusion

Finally, many other factors influence how well, or if, we process information, including motivation, attention anomalies, stress, etc. But they all essentially have the same effect: to disrupt the already limited method by which we detect information from our environment, assess its meaning, and decide what to do about it.

How can you do a better job of processing information while you're flying? Without very specialized training (not currently available in the Air Force), just being *aware* of

- 1) *how* your mind processes the many inputs you receive when you are flying and
- 2) some of the pitfalls that hamper the process may help you overcome some of these limitations at a critical moment. When you fly, be prepared for the expected, but *look* for the unexpected. There is no time flying when you don't have to pay conscious attention to what's happening around you. When too much is happening around you to keep track of, attend to the most important—safe control of the jet.





# TAC

tips

INTEREST ITEMS,

TAC Tips Interest Items.

## Bird brain

**F**ive miles from the IP, an F-4 doing 500 knots struck a bird. The aircrew saw no indications of damage and pressed on with the mission. On



postflight, the crew chief discovered a mangled engine and gashed vari-ramp. J-79s are tough. But they're also expensive.

The 55-series regs say to knock it off after a birdstrike. Period. If we would do that in peacetime, we would have more jets and engines available to fly in combat.

As a wise old Cajun is fond of saying, "When you're going 500 knots and hit something with feathers, and don't knock it off and don't RTB, you're asking for someone like the commander to *SPLAIN* to you (with a 2-by-4) how to make decisions on the conservative side of safety."

Let's fly smarter.

## Pulling the Phantom's plug

**P**icture yourself cruising along in your thunder Rhino at high altitude on autopilot. Yawn. All of a sudden, WHANGO! Spurious electrons running through your flight controls cause an unscheduled departure from controlled flight. As you practice your out-of-control recovery procedure, you notice the aircraft still wants to roll. The paddle switch is ineffective and so is turning off the stab augs. Here's a tidbit of info to tuck away in your memory banks.

When a T-38 pilot noticed his aircraft's aileron trim suddenly develop a mind of its own, motor-ing off in one direction for a while and then the other, he tried to counter with the trim button on top of his control stick. No soap. So the pilot in the other cockpit tried his, to no avail. Then, he pulled the trim circuit breaker. That stopped the cyclic aileron oscillations. Soon, however, the stick slowly began to drive aft, taking the aircraft's nose uphill. Then the nose-up pressure would suddenly release. This series of on-again off-again back-stick pressure continued despite checklist attempts to correct it.

During the controllability check, it took two hands worth of armstrong power steering to overcome the back-stick forces. When the aircraft descended into the clear below an overcast, the pilot turned off the aircraft generators which immediately alleviated the flight control problems. Landing was uneventful.

Being a jet that most USAF F-4 pilots are familiar with (about 200 or so flying hours worth of



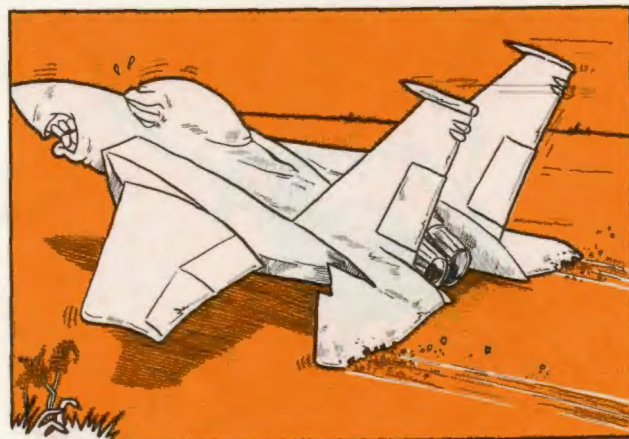
## MISHAPS WITH MORALS, FOR THE TAC AIRCREWMAN

familiarity), the T-38 is known to be a pretty simple machine compared to Double Ugly. Yet, if pulling the plug fixes a flight control problem on a two-hole supersonic training aid, might it not be a good last resort for the Phantom pilot who has exhausted the flight control malfunction checklist?

By the way, for those of you in other jets, this doesn't apply to many of you. Shutting off the power to the electric jet is scary to even think about, and with a flight control malfunction in an F-15, the CAS may be the only thing providing control.

### Beak power (nose authority)

**D**uring aerobraking after an uneventful landing, an F-15 pilot noticed he had inadvertently allowed the aircraft's pitch to exceed 13 degrees nose high. With about 70 knots on the airspeed indicator, he was looking at 15 degrees on the ADI; so he immediately unloaded the control stick to avoid scraping the tailcones at 16–17 degrees. By doing so, he successfully avoided dragging the nozzles or tailcones, but he ground a couple of pounds of each of the Eagle's stabilizers. "How do you do that at 15 units?" you might ask.



The contractor's tech reps confirmed that the following formula would allow the stab tips to be scraped without damaging the tailcones or nozzles:

- >15 degrees of pitch
- + <80 knots
- + placing the control stick forward to neutral or further.

The net result of these circumstances is reduced nose authority at the same time the stabilator is in close proximity to the runway. With the stage set, excessive forward stick sends the trailing edge down into the concrete.

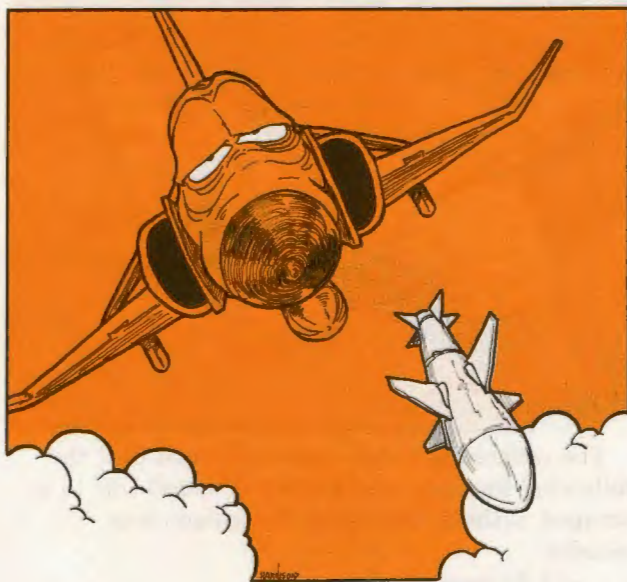
By the way, if you can read the HUD that precisely, the tech reps also say the nozzles bite the dust (concrete) at 16.3 degrees and the tailcones follow suit at 16.8 degrees.

A number of us marvel at the Eagle's nose authority every time we see one land (or turn an impossibly tight corner and convert an overshoot to a guns kill). But like all authority, nose authority must be used responsibly, within limits. Strength under control—that's professionalism.



## \*%#!?!! Switches

Some years ago in SEA, a Rhino driver who had overstayed his bingo on a CAP mission decided he needed to get rid of some drag devices in order to make it back to home base. Unfortunately, because of less than full attention to switchology, he left behind an AIM-7 instead of the centerline external fuel tank.



Many of our modern fighters were put together with the pilot in mind. As a result, the switchology monster rears its ugly head a little less frequently. That isn't to say he's gone away . . .

About ten minutes after engine start, while waiting to take off, an F-16's engine suddenly flamed out, which automatically cranked up the EPU. The bewildered pilot shut down both the motor and EPU and hopped out. Later, some troubleshooters found the Fuel Master Switch in the Off position. Apparently both the crew chief and pilot missed the red guarded switch out of position during their preflights.

Normally with that switch Off, flameout occurs about 40 seconds after start. But a corroded cannon plug en route to the MFSOV (main fuel shut-off valve) apparently delayed the event. Good thing it didn't drag it out a little longer, like a

couple of seconds after liftoff . . .

They're building 'em better—but human nature's still the same. Only one way to beat it—a healthy dose of checklist discipline.

## Too much expensive Speed is life

An RF-4 crew was flying a low-level simulated combat mission during a local exercise. After acquiring all the assigned targets, the pilot accelerated to the planned 600-knot groundspeed to egress to the target area and re-enter friendly airspace. The transonic Photo Phantom allegedly created a shock wave that damaged some private property. One of the structures that supposedly took the brunt of the *kill'em with fillem* attack was a concrete building that housed a steam generating plant.

Some of us are fond of saying *speed is life*. And in combat, when fuel permits, we alone, unarmed and unafraid recce crews might want to deliver a surprise shock wave when overflying Shock armies. During mission planning for our peacetime training missions, however, we need to examine the *when* and the *where* of such realism.

When? Not on the leg that takes 630 knots true airspeed to give you 600 ground. And that could be any of them. If INS failure is the only reason you have for crosschecking the true airspeed indicator while flying low-level, you might consider this.

Where? Not over the little berg or dorf on your 1968-vintage 1:250 map—that little dot is now a fair-sized city with schools, hospitals and at least 37 angry people with telephones.

It's becoming harder and harder to find low-level routes east of the Mississippi that aren't over someone's roof. By better planning and a little common sense, we can pull in our own rei before the natives get restless and put us out to pasture.



# AIRCREW OF DISTINCTION



**O**n 23 November 1984 MAJ JOHN V. WILLIAMS and CADET PETER G. BRANDT (GAF) were in the lead aircraft of an F-4E two-ship making a formation landing. CAPT MARK M. RUMOHR was the IP in the wing aircraft with a student pilot in the front cockpit. Captain Rumohr's Phantom was on the left wing because of a five-knot crosswind. The aircraft touched down together with 10-15 feet wing tip separation, 500 feet down the runway. The pilots sequentially deployed drag chutes. Everything appeared normal.

As the airspeed decreased through about 120 knots, Captain Rumohr noticed a slight drift towards the lead aircraft and directed the student pilot to maintain separation. Thinking the drift was caused by the crosswind, the student jettisoned the drag chute. As the drift became more pronounced, Captain Rumohr took control of the aircraft and applied full left aileron, rudder and brake, all of which had little effect.

Meanwhile, in the lead aircraft, Cadet Brandt told his IP in the front cockpit that the wingman was drifting in and directed him to "Come right." Major Williams saw the collision developing, selected Mil power on both engines and aggressively moved the aircraft right. Before the lead aircraft's power became effective, however, the radome of the wingman's F-4 grazed lead's wing-tip.

As nose-tail separation rapidly increased, the wingman's aircraft now began drifting left. Seeing lateral separation, Major Williams reduced power to idle and used heavy braking to get behind the wingman. This allowed the wingman to use the full width of the runway and cable.

Captain Rumohr responded to the left drift by reversing controls, using the right brake and advancing the left throttle, which was effective. At



**Maj John V. Williams  
Cadet GAF Peter G. Brandt  
Capt Mark M. Rumohr  
20 TFTS, 35 TTW  
George AFB, California**

this point, the student in the front cockpit told him that the utility hydraulic pressure indicator was reading zero, which meant no normal braking, no nosegear steering and no antiskid.

Captain Rumohr told the student to lower the tail hook and pull the emergency brake handle. Then Captain Rumohr stopped the aircraft just short of the departure-end cable. Major Williams stopped his Phantom about 300 feet in trail.

All three crew members displayed a very high level of airmanship, handling a utility hydraulic failure at a critical stage of a formation landing. Their efforts avoided a possible catastrophic accident and earned them the Tactical Air Command Aircrew of Distinction Award. ➤



# Professionalism and Personal Relationships

## Are you good at both?



This article was adapted from a briefing titled "The Failing Aviator" that was presented during physiology training here at Langley by Maj Lanny Geib, Chief of Aerospace Physiology, 363 TFW, Shaw AFB, South Carolina.

### Marty Diller

**S**implicity is gone; now, it's sophistication. A pilot doesn't just fly an airplane, he flies a complex weapons system, like the electric jet; he doesn't just drop a bomb, he launches it; and he's not just a family man whose job is to fly fighters, he's an Air Force

fighter pilot who lives to fly and to complete the mission. To be successful, tactical aviators, like other professional groups, must be in control and compartmentalize. While these are necessary traits to fly safely, they can also cause problems with personal relationships.

Pilots are trained to control their aircraft using the method of measured input gives measured response: move the stick to the right one inch and the right spoiler comes up a given distance. At 500 knots, moving the stick back this far will always give you six Gs. And you know where every switch is

and what each one does. You have to. In the heat of battle, there's no time to sort minor problems; everything has to work and be dependable. Control becomes a necessary part of a pilot's life, which can be carried over into the family.

Some pilots start the day off by telling their families how to run their day: *I want you to do this today, or please make sure this is done before I get home.* But this control input without further discussion or explanation makes communication difficult for family members; 91 percent of divorce in the Air Force is due to lack of communication. In a social setting,

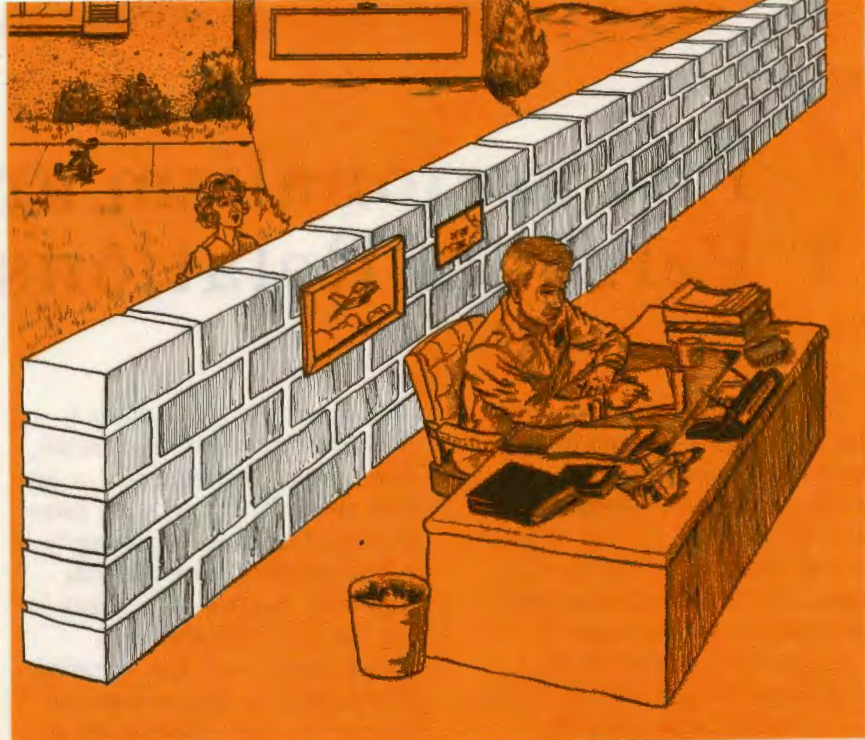


pilots are willing to talk about what they know about: flying, sports, hobbies and flying. Things they haven't done or aren't interested in can't be controlled, so they don't like to talk about them.

Feelings and emotions are considered a weakness because they are perceived as signs that you're not in control. Often, feelings are covered up with shams and facades. Many times a pilot will say *I'm fine, thank you* when he really isn't fine. Many would like to express feelings and emotions but don't because of their perception that feelings and emotions are considered a defect in the flying community; some pilots think it's risky to show them.

Not showing how you feel is perceived by your family as not caring. Your spouse wonders how you know what she is feeling or what the kids are feeling when you don't display your feelings. This perceived lack of caring is especially evident in solving problems. Some pilots solve problems at home by simply going to work and leaving the problem with the spouse. You get busy with flying activities and the problem goes away. A conflict with a neighbor, paying bills, transferring money, getting the kids to and from school; you go to work and it becomes the spouse's problem. And generally she's solved it when you get home. This solution system is adding to the communications gap. Problems also arise during TDYs.

Did you realize that you mentally deploy for a TDY one to two weeks before actually leaving? Going TDY and leaving your family does bother you, but in order to handle it, you



withdraw instead of sharing your concerns. Your spouse then reacts to this withdrawal, and about three days before the TDY, you and your spouse are really fighting. You're saying *Boy, I'll be glad to leave all of this and concentrate on a real love—flying*, and your spouse is saying *I can't wait until he's gone, then I'll fix all of this without his help*. While on TDY you reflect back on the nice things and start writing warm, loving things in your letters. Your spouse feels guilty too and can't wait for her warm loving aviator to return home. But the need to control is very strong; so about a week before you get home, you stop being warm and loving. As soon as you walk in the door, nothing suits you: the car's dirty and isn't filled up with gas, the grass isn't cut, the trash cans are still out front. After all, you need to feel missed, and if they can get along without you, you really don't have control.

Being in control not only hurts family relationships, it can make you susceptible to complacency while you're fly-

ing. You're a pro; you're good at your job and don't like to think that you can make mistakes—airplanes only kill others. But familiarity with your jet and how you use it breeds contempt; soon, overconfidence and complacency set in. When you think you've mastered the aircraft (*I've got control*), that's when you start making mistakes. Complacency affects family life too. Think about what you did when you dated compared to your present married life: you opened the door for her, enjoyed good conversation and went out to dinner often. It was a treat just to be with her. Now your marriage may be the victim of complacency.

It takes about six months to become familiar enough with a weapons system to start becoming complacent. The same principle is true at home. About every six months re-evaluate your family life and do something about it. A weekend getaway or just a quiet dinner alone together is a great way to renew your relationship.



# Professionalism and Personal Relationships

To be 100 percent professional, pilots have learned to compartmentalize. When you get ready to fly, everything except flying has to be put out of your mind. That's why you're so good. And the more you compartmentalize, the easier it gets to push the rest of the world out. That's not very good for a family. Has compartmentalizing made you a slave to ritual? Do you lack spontaneity, and are you unwilling to change compartments until you're finished with the one you're in?

Sometimes methodology supersedes the goal. If you have a habit pattern, once you've com-

pleted your ritual, it doesn't matter what clues you receive, you tend not to recognize or accept them. That's why we have gear-up landings. Learning to compartmentalize made you that way. You've got a checklist for everything you do. Think about your last vacation. Everything is always done in the same order, and the effect of your actions is always the same. A similarly predictable lifestyle can become a "ritual with the spouse"—you always kiss her goodbye in the morning, then put the dog out and then go to work. But ritual at home can be unexciting and monotonous. Do something dif-

ferent and extra special. Surprise her.

The Air Force has trained you very well to fly fighters by instructional system development. You get a set stimulus and are expected to give back a set response. A standard pattern is required. You've become so good at compartmentalizing that you prefer to compartmentalize rather than free-think. When you're flying along and not everything goes by the Dash One, you have to free-think. If you're overdependent on structure, it may lead you to grab the first thing that's plausible and use that as your first action. Take a look at that—do you have that tendency?

Once you're in a compartment, you don't like to come out of it until you've completed it. *Dad, will you take us to the movie? It starts in 15 minutes. Not now, I'm mowing the grass.* The kids receive the message that mowing the grass is more important than they are, but you know that you love them and only want to finish a started task.

Last year was one of the best for safety; this year is off to an even better start. That means your control of the aircraft and ability to compartmentalize is excellent. That may also mean you need to take a look at your relationship with your family, re-evaluate it and decide whether anything you've read in this article applies to you. ➤





## TAC FLIGHT SAFETY AWARD OF THE QUARTER

**CAPT STEPHEN P. RANDOLPH** is an innovative and aggressive flight safety officer. A recent 12 AF staff assistance visit concluded that the 550 TFTS safety program is a "model." Its success is measured in the squadron's record during Captain Randolph's tenure: there have been no Class A or B mishaps in over 13,000 flight hours.

During his tenure as safety officer, the 550 TFTS began low-altitude operations and deployed to RED FLAG for the first time. He anticipated each of these events and worked with the weapons section to ensure that the squadron would perform safely and effectively. His RED FLAG preparation program was adopted as standard across the 405 TTW.

Captain Randolph has employed tremendous energy and ingenuity in improving the operations/maintenance liaison. He composed a briefing for arriving AMU supervisors, alerting them to Luke's prevailing hazards and educating them on Air Force flying safety programs. He followed this briefing up with a series of mishap response exercises, preparing both the operations squadron and the AMU for a major mishap. The computer program he developed to track aircraft status has assisted both maintenance supervisors and squadron pilots in staying aware of particular aircraft and fleet trends. His contributions to the establishment of a squadron awards program have helped improve morale across the entire AMU.

Captain Randolph's contributions at wing-level have been equally outstanding. His efforts helped earn excellent ratings for four of the wing's squadrons during the 405 TTW's last MEI. He has



**Capt Stephen P. Randolph**  
550 TFTS, 405 TTW  
Luke AFB, Arizona

represented the wing at several systems safety conferences. He was instrumental in the revision of the maintenance operating instruction on materiel deficiency reports (MDRs), his inputs serving to decrease the number of parts lost to supply and increase the feedback to the line workers who submitted the MDR.

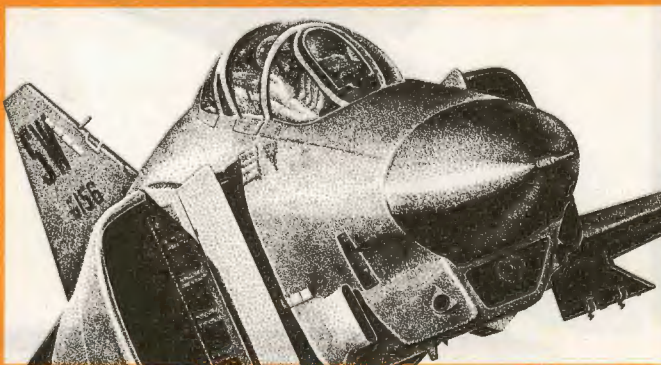
Captain Randolph's thorough mishap investigations have provided another contribution to the safe operations of the 405 TTW and the F-15 fleet worldwide. His investigations of F-15 wing-tip failures and rudder spline bolt malfunctions have identified discrepancies in tech data and supply system prioritizations.

## HEADS UP

Next month in the

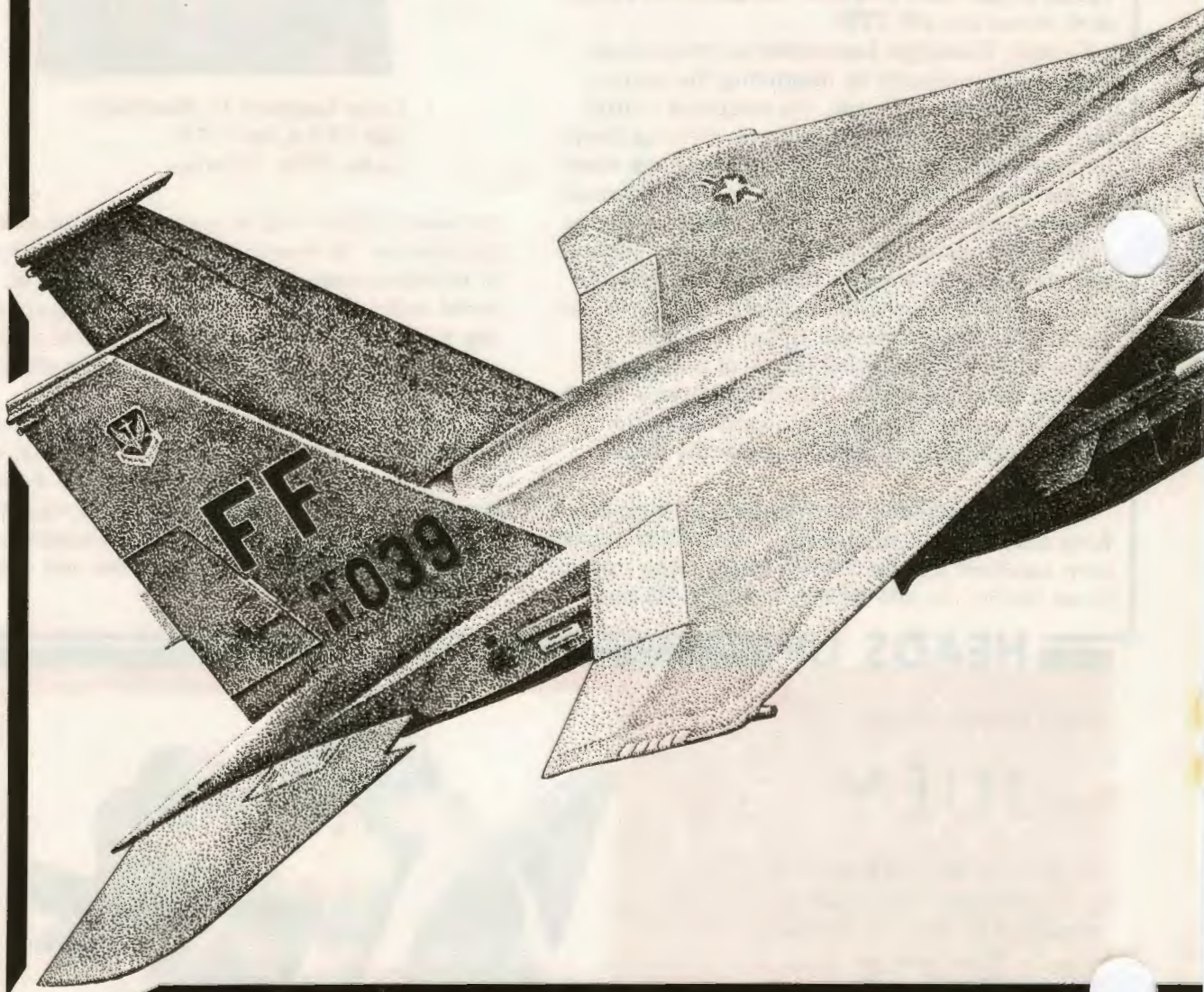
# JULY

issue of **TAC ATTACK** you can look forward to seeing A1C Kelvin Taylor's stipple rendition of the F-4C Phantom II **IN THE CENTER.**

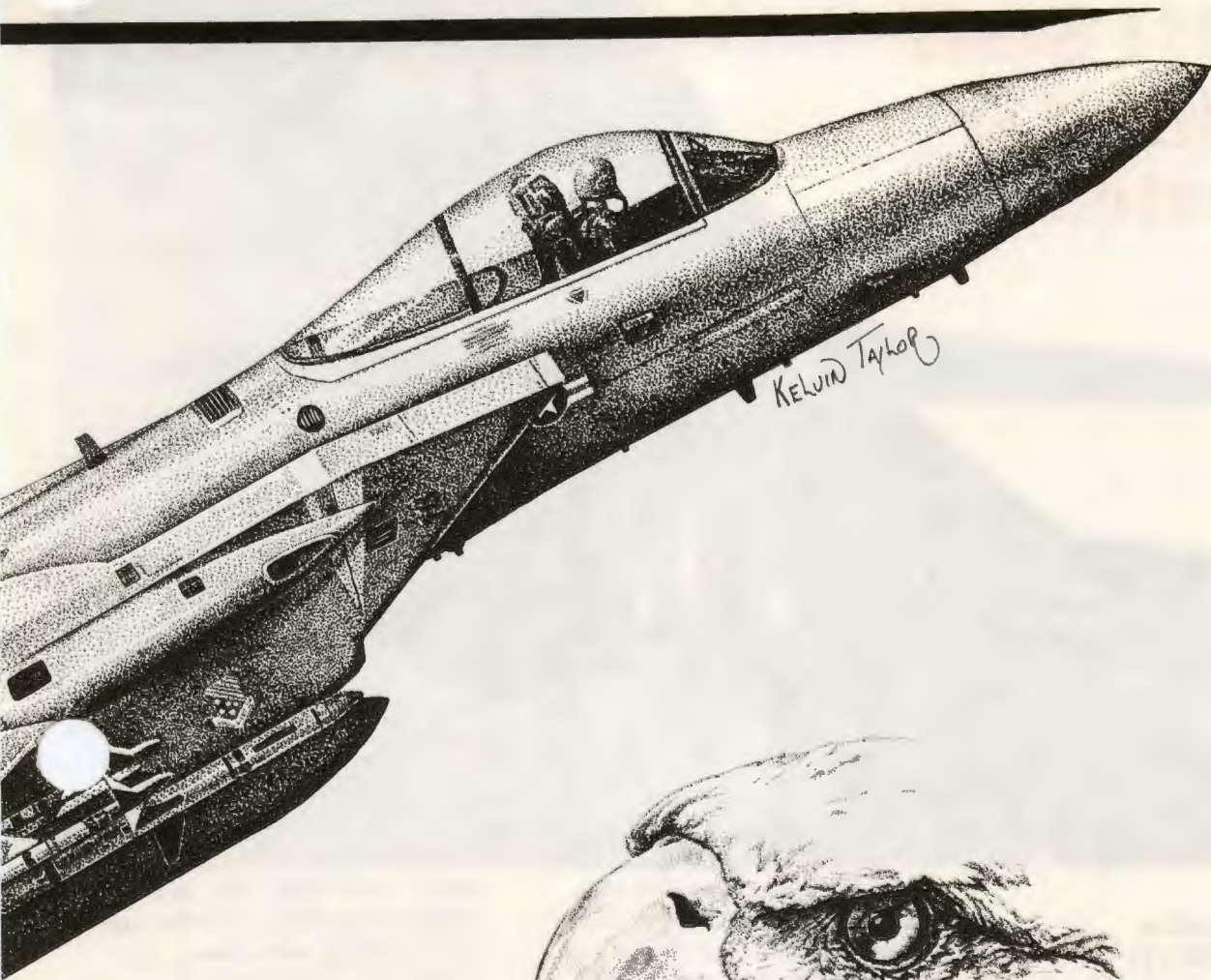




# F-15C EAGLE









# F-111 Stall Inhibitor System



Maj Jon Jordan  
HQ TAC/SEF-111

**R**ED FLAG — best peacetime flying there is. You've just come off target, turned to your egress heading and pulled the wings back to 54 degrees. Two's coming up nicely on the right. Checking fuel you find that you're both 4,000 pounds fat. Terrific! *I know how to fix that, you think. A few minutes in burner ought to take care of that excess fuel in addition to putting us over the Mach. Nobody'll catch us then.*

Just as the burners light you see an F-5 in his conversion turn at left 9 o'clock, slightly high, about a mile out. *Com-*

*mie! We'll just turn into him, unload and go. "Bomber pukes" — that's what they always call us. I'll show him that this "bomber" can turn.*

You start your turn. Stall warning. *Play the 14 alpha. Not a bad turn, but . . . What the hell, I'll just pull to the limiter for a couple of seconds and really water his eyes.* You grunt a little harder and pull the stick back farther. All of a sudden, the nose slices right. Simultaneously, the aircraft rolls right. Before you can do anything, you feel the shoulder harness pull you back tightly and you're forced down in the seat to the tune of a tremendous roar. You realize that your WSO has pulled the ejection handle. @\*&#%!!! You can't tell your attitude, but you

know you're dead. Yet, in a couple of seconds, after the capsule's rolling slows down, you realize that, miraculously, your ejection vector was upright.

The rest of the ejection sequence is textbook. After filling all the post-ejection and SAR squares, you sit down and wait for the chopper to come pick you up. And you think. And you think some more. What happened? A SIS-modified aircraft can't depart controlled flight. What went wrong?

The above situation can happen — in fact, it will happen every time — if either AOA probe sticks below approximately 18–20 degrees and the pilot doesn't monitor and control AOA. The explanation lies in the Dash One figure of the SIS probe selector's logic:



## SIS Probe Selector Logic

Difference between left and right AOA probes in degrees	Beta probe position in degrees	SIS Caution lamp	Type signal selected
less than 6 degrees	less than 7 degrees	OFF	lower AOA
greater than 6 degrees	less than 7 degrees	ON	lower AOA
any	greater than 7 degrees	INHIBITED	higher AOA

The SIS computer uses only one AOA value at a time; it doesn't average the two inputs. As long as the beta probe's position is less than 7 degrees, SIS will always use the lower AOA. But if either AOA probe sticks, you are effectively flying non-SIS aircraft.

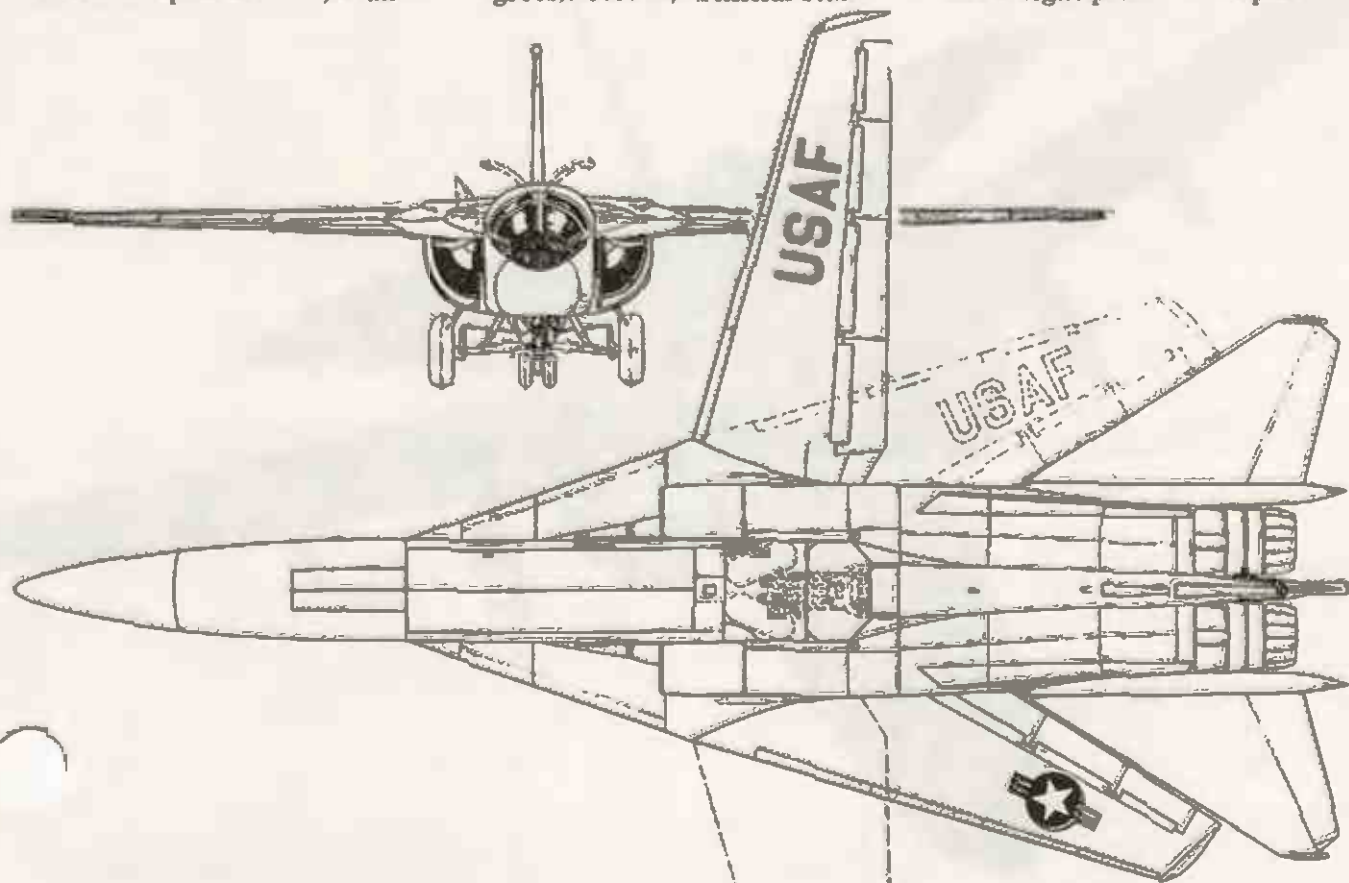
This discussion will use only two assumptions. First, if an

**If either AOA probe sticks, you are effectively flying a non-SIS aircraft.**

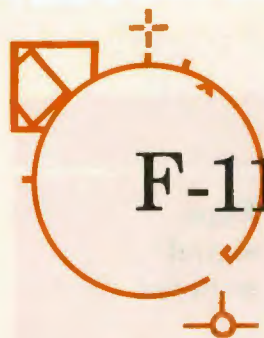
AOA probe sticks, it will probably stick at some value in the normal AOA range (3–14 degrees). Second, artificial stall

warning will occur at 14 degrees. Although the system is designed to come on at 18 degrees (14 degrees plus pitch rate), experience shows that it comes on at 14 degrees during normal maneuvering.

Now, how does a stuck AOA probe give you a non-SIS aircraft? First, let's consider a stuck right probe. If the probe







# F-111 Stall Inhibitor System

sticks at a low value, say 3–4 degrees, as in low level cruise, when you begin to maneuver, it becomes (and remains) the lower AOA, effectively suppressing alpha limiting. As long as beta remains less than 7 degrees, the logic of the SIS probe selector will continue to use the smaller AOA input — the one from the stuck probe. As far as SIS is concerned, no alpha limiting is required — AOA is 3–4 degrees, nowhere

close to the limit of 18–20. The only cockpit indication of a problem is a SIS caution light when the left probe exceeds 9–10 degrees (greater than 6 degrees difference between probes). If you miss the light (padlocked on the attacker), nothing else will warn you of the problem. All artificial stall warning cues function normally, as does the AOA tape — they come off the left probe. So nothing else changes — same

stick force gradient above 11 degrees AOA; stall warning tone, light and pedal shaker above 14 degrees. Just one little difference. When your true wing AOA reaches 18–20, nothing will stop it from exceeding stall AOA except you, the pilot.

Let's take the same situation (stuck right probe) except this time it sticks at a higher value, say 13–14 degrees, while you're maneuvering. In this situation,





if you were to relax back pressure (e.g., a 14 alpha turn followed by a return to one-G flight), the SIS light would come on when the left probe dropped below 7–8 degrees (6 degree difference). You'd probably have a better chance of noticing it this time. If you ignore it and continue to maneuver, you're back to a non-SIS aircraft. If you indiscriminately pull back on the pole, relying on alpha limiting, you're in for a surprise. As your (left) AOA

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**If you indiscriminately full back on the pole, relying on alpha limiting, you could be in for a surprise.**

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increases through 7–8 degrees, the SIS light goes out. *See, nothing to worry about*, you think (wrong, you still have something to worry about; it's just that the two probes now agree within 6 degrees). As you pass 14 degrees AOA, artificial stall warning occurs (normal), but now the right probe (stuck at 13–14) is selected as the lower AOA signal and alpha limiting will not be available. At 19–20 AOA, just prior to departing controlled flight, the SIS light will again illuminate.

Similar scenarios can be constructed by freezing the left probe at a fixed value. The results are the same — a non-SIS



aircraft. There are subtle cues in addition to the SIS light — the AOA tape will be stuck and artificial stall warning will be inoperative (unless you have a good feel for the aircraft, you may not notice this before the nose slices).

So what am I trying to get across? Simple. Fly the aircraft within Dash One limits. Don't intentionally put yourself in a situation where you're relying on SIS. SIS was an add-on to help reduce loss-of-control mishaps. And it works well. But the fact that it has an alpha limiter doesn't mean that we should be flying the F-111 like an F-16. Besides, let's face it, the F-111's turning performance isn't going to water anyone's eyes — not even at 18 alpha. We deplete energy in sustained hard turns. The harder we turn, the faster we slow down, leaving us a sitting duck when we roll out. The

smart way to fly the airplane is to manage energy. In my mind, the only thing that justifies turning above 14 alpha is a last ditch effort — a missile break for example.

One last word. I hope this article has drawn your attention to the Achilles' heel of the system — the AOA probes. They're delicate instruments. I always cringe when I see someone grab one with his grease-soaked flight gloves (you know, the preflight pair) and bash it from stop to stop. Try to avoid introducing any foreign matter into the slots. My technique has been to place a finger along the trailing edge and slowly, gently move it up and down to run the probe through its complete range of travel. It takes about two seconds longer, but it's a lot easier on the equipment and any tendency for the probe to hang up is much more readily recognized. ➤





**Six steps to safer use of pesticides.** 1) Read the label before you use any pesticide product and follow the directions carefully. 2) Don't apply

**PRECAUTIONARY STATEMENTS**  
**HAZARDS TO HUMANS & DOMESTIC ANIMALS**  
**WARNING:** Causes eye irritation. Harmful if swallowed. Do not get in eyes, on skin or on clothing. Avoid breathing vapors or spray mist. In case of eye contact, immediately flush eyes with fresh water for 15 minutes and get medical attention. If swallowed, promptly drink a large quantity of water and induce vomiting. Get medical attention immediately. Wash skin and hands thoroughly with soap and water after using and immediately in case of skin contact. Remove and launder contaminated clothing before reuse.  
**Note to Physicians:** Emergency Information—call (415) 233-3737. This product contains a cholinesterase inhibitor. If signs and symptoms of cholinesterase inhibition are present, atropine is antidotal. 2-PAM may also be given in conjunction with atropine. Keep children and animals away from treated areas until these areas are dry. Food utensils such as teaspoons and tablespoons should not be used for food purposes after use with pesticides. **ENVIRONMENTAL HAZARDS:** This product is toxic to fish, shrimp, crabs and other aquatic organisms. Keep out of lakes, streams, ponds, tidal marshes and estuaries. Do not apply where runoff is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes. This product is highly toxic to bees exposed to direct treatment or residues on crops. Protective information may be obtained from your Cooperative Agricultural Extension Service.  
**PHYSICAL OR CHEMICAL HAZARDS:** Do not use or store near heat or open flame.

**DIRECTIONS FOR USE:** It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
**READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH LABEL PRECAUTIONARY STATEMENTS AND DIRECTIONS.**  
**STORAGE:** Keep pesticide in original container. Do not put concentrate or dilute into food or drink containers. Avoid contamination of feed and foodstuffs. Store in a cool, dry place, preferably in a locked storage area. Do not store diluted spray.  
**DISPOSAL:** Partially filled bottle may be disposed of by securely wrapping original container in several layers of newspaper and discard in trash. **CONTAINER:** Do not reuse empty bottle. Rinse thoroughly before discarding in trash.  
**NOTICE:** Buyer assumes all responsibility for safety and use not in accordance with directions.

pesticides outdoors on windy days. 3) Avoid inhaling pesticides or spilling them on your skin or on the ground. 4) Wash thoroughly with soap and water after using a pesticide and wash the clothing you wore separately from other laundry. 5) Never transfer a pesticide or other poison into a

container, such as a soft drink bottle, that would attract children. It is illegal to do so and extremely dangerous. Always keep children and pets away from pesticides, application equipment, treated areas and used bottles or cans. 6) Dispose of all empty containers as directed on the label.

**Kosher meat,** according to researchers at the Albert Einstein College of Medicine in New York, has almost twice as much sodium as un-kosher meat. There's a solution: soak veal or beef in fresh tap water for about an hour; the salt level goes down to pre-kosher level.

**Jumping rope** with one-minute breathers is as aerobic as walking, running, dancing or swimming say researchers at the Institute for Aerobics Research in Dallas, Texas. Jumping one minute then resting for one minute for at least 22 minutes is the regimen. During the breather, the heart rate stays high enough to remain at training level.

**Here's one for sushi eaters.** There have been reports from doctors at Japan's Kyushu University that raw fish eaters could get larval infections. The larvae, each about an inch long, attach themselves to the stomach lining and cause severe pain and nausea. If you're a sushi eater, you can spot the one-inch larva, which looks like a circle of spaghetti, by holding the fish up to the light or cutting the fish into strips.

**And now there's swimmers' tooth.** According to the American Academy of Pediatrics, 39 percent of the competitive swimmers and 15 percent of frequent swimmers get swimmers' tooth. It's an erosion of dental enamel caused by swimming in overly acidic pool water (usually from using less-expensive chlorine gas). The symptoms: teeth feel gritty or rough, look transparent or yellow or hurt when food is chewed. The solution: strict monitoring of a pool's pH levels.

**Water slides** are the leading source of amusement ride injuries treated in hospital emergency rooms according to the Centers for Disease Control. Although the injury rate is small, only about 3 out of every 10,000 riders, it's still worth mentioning. The slide itself isn't the only problem people with allergies risk reactions from grasses and pollens being implanted in their skin on the fast ride down.



# TAC SAFETY AWARDS

## INDIVIDUAL SAFETY AWARD

**T**SGT NOEL L. SPECHT was appointed Ground Safety NCO for the 325 CRS because of his safety-conscious attitude both on and off duty. He hasn't let the squadron down.

Sergeant Specht developed an easy-to-understand work-center safety briefing to serve as a reminder to senior maintenance managers and also introduce safety program requirements to newly assigned members. He trained and guided branch safety monitors in identifying unsafe equipment and operational procedures. He standardized the contents of the monitors' notebooks and reviews them quarterly. He also developed work-center, branch and squadron safety inspection checklists and a standard list of essential items for squadron safety bulletin boards.

Statistically, the reduction in the number of on- and off-duty injuries (1 vs 0 on-duty; 4 vs 2 off-duty) and mishaps resulted in a substantial monetary difference between 1983 and 1984: \$7,245 vs \$2,705. A Dec 84 TAC Management Effectiveness Inspection report sums his program



**TSgt Noel L. Specht**  
325 CRS, 325 TTW  
Tyndall AFB, Florida

up this way: "The superior squadron safety program is a model for other wing units to follow."

## SPECIAL ACHIEVEMENT IN SAFETY AWARD

**I**n 1984, the 31ST AIRCRAFT GENERATION SQUADRON set a goal to reduce the number of mishaps that occurred in 1983 by at least 25 percent. Through the use of an excellent safety management program and outstanding commander and supervisor support, the squadron exceeded its goal by over 55 percent.

Reportable mishaps were reduced in all areas (83/84): on-duty, 5/0; motor vehicle accident (4-wheel), 5/1; motor vehicle accident (2-wheel), 5/3; sports/recreation, 5/2; miscellaneous, 5/1. There were 6 minor government vehicle mishaps in 1983, reduced to 2 in 1984. Chemical burns on the wash rack requiring hospital treatment were reduced from 10 in 1983 to 5 in 1984.

The squadron also implemented a strong seat-belt program which brought seat belt use up from 60 percent in 1983 to over 75 percent in 1984. Nice job, 31st Aircraft Generation Squadron.



**31 AGS**  
Homestead AFB, Florida



# WEAPONS WORDS

## Exercise, exercise, exercise

**N**ightfall. End of a l-o-n-g day. *No more alarms red and black for me. Let the night crew play these games for awhile. Whew. I've earned my pay today. Time to get some dinner and get out of this sweaty chem gear.* Then, on the way to the car—BOOM! “Alarm red, alarm red, alarm red. Take cover.”

If you haven't been there, you haven't been a member of the TAF (tactical air forces) very long. But what about that boom? Ever wonder where it comes from?

That explosive sound, which we have all learned to dread, comes from an M115-A2 ground burst simulator (GBS), an explosive device used at many air bases to simulate an airfield attack. And like any explosive device, a GBS is not harmless. In fact, it contains more explosive than a quarter stick of dynamite.

Not long ago, an Air Force member who was participating as an aggressor in an airfield attack exercise suffered a permanent eye injury

from the GBS he threw. The GBS landed on the concrete ramp near a building; the fuse end was pointing at him when it detonated. Even though the device landed over 50 feet away, fragments hit him in the face.

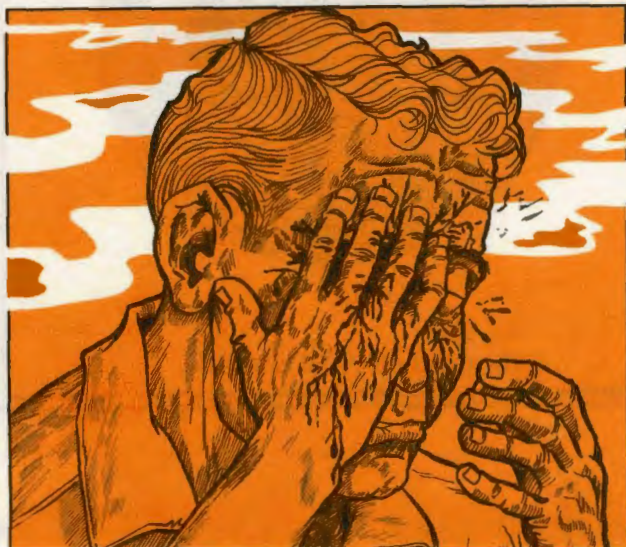
Apparently, his normal practice had been to throw the GBS into the area behind him. But it was dark and that area wasn't lighted. Not knowing if other people were around, he threw the GBS into a lighted area in front of him. But he didn't completely turn away from the blast like the warning says on the instructions printed on the GBS.

In another incident, a group of personnel received minor injuries when an overzealous aggressor pitched a GBS near them. While he got their full attention, injuries are beyond the scope of realism.

If you happen to be lucky enough to be on the exercise team, you may have the privilege of sending the whole base scrambling for cover in response to your GBS. If you do, **READ AND HEED THE INSTRUCTIONS** printed on the device.

## Stuffed

**O**ne member of a load crew was correctly using a loading tool to install 2.75-inch rockets into a LAU-68 rocket launcher that hung under the wing of an OA-37 Dragonfly. As the







worker slid the first of four rockets into one of the launcher's tubes, he noticed the rocket wouldn't lock into place. Hmmm.

On his third attempt, the frustrated worker gave the rocket a healthy shove and stuffed it in the tube. This time it stayed put. It didn't lock like he expected; it was shoved past the stop block and jammed the contact finger around the rocket motor. Neither the load crew, the line supervisor nor the explosives ordnance disposal team that was called could extract the 2.75-inch rocket.

EOD workers removed the launcher from the aircraft and took it to the EOD range where they tried once more, again unsuccessfully, to remove the rocket. With all their good ideas exhausted, they destroyed the rocket and launcher.

Maybe the stop block inside the launcher was insecure. More likely, the application of too much force caused the rocket to stick inside the tube. And the result was a wasted LAU-68 launcher.

Let's face it—some of our work can be downright frustrating. But that gives us an opportunity to demonstrate professionalism. Because strength under control, divorced from emotion, is what professionalism is all about.

## Chaff protection

Football players have pads and helmets. Aircrews have Nomex flight suits and survival vests. And some weapons handlers have

protective equipment too. As a rule, neither football players nor aircrews grumble about wearing their gear—they know the equipment is for their own good and may save them from an injury. And now we know at least one weapons handler who doesn't murmur about the inconvenience of wearing his gear. Shadrack's a believer.

Late one night, Shadrack was working with RR 141B chaff packages. These are hard plastic containers stuffed with a handful of fine-cut chaff. An explosive charge inside the container rips apart the plastic and releases the contents into the air to confuse enemy radars. Shadrack was taking the chaff packages out of the container he had used to transport them in and was placing them into the tray of an ALE-28 chaff dispenser under an F-111. As he placed one of the packages into the tray, it exploded in his hand.

It's a fairly well known fact that the igniter safety rod within RR 141Bs readily falls out, especially when the chaff packages are being moved. Apparently, that's what happened here. When the chaff package contacted the bottom of the tray, the small jolt was enough to initiate the explosive.

Until a new chaff package is in the field, this hazard isn't going to go away. In the meantime, caution and protective equipment are our best defense.

By the way, Shadrack was wearing gloves and a face shield and had his shirt sleeves rolled all the way down. And he walked away without a scratch.



# LAST LOOK



Capt Robert M. Hesselbein  
549 TASTG/SE  
Patrick AFB, Florida

Ed note: The findings of some safety investigating boards seem almost ruthless to some of us who knew the aircrews involved. How did they come to such conclusions? Capt Hesselbein, who has served on several boards, offers some insights.

**T**he captain shook his head. *I just can't believe such an experienced pilot could let himself end up flying into the ground at night.*

The safety investigation board's work was finished at the crash site, and it was time to prepare for the inevitable briefings at headquarters. It wasn't necessary, yet both he, the investigating pilot and the colonel (board president) felt a need to drive out and view the scene one last time. Perhaps both of them needed to purge their minds of any lingering doubts and reaffirm the board's findings.

The area of the crash was quiet now, quite different from the rushed activities that followed the fiery, nighttime crash of a USAF jet fighter.

The captain stopped at the edge of the main crater. Here is where they pulled the separated and broken flight instruments from the mud, the area where the flight control actuators were discovered in an almost unrecognizable condition. Earlier, the recovery team had carefully separated the individual parts required for the investigation and wrapped them for the trip to depot for analysis. The stakes were still



in the ground where the team had placed them to aid in performing the wreckage survey which was critical to determining the aircraft's final vector. The wreckage plot confirmed the mishap airplane had struck the trees that night in a controlled fashion.

The captain thought of the last 25 days' effort and shook his head. *No doubt about it*, he thought to himself, *the interviews were the worst part*. Although everyone was helpful and cooperative, he still felt like an intruder in the private grief of the squadron, asking awkward questions to wingmen, friends and family of the lost pilot. There was no other way to eliminate the unknowns. It was awful not knowing how to answer the questions put to him except to say, "We're looking at all possibilities." The reply was unimaginative and inadequate, but oh how truthful.

He remembered how the board considered all the possibilities during the course of the investigation. The mystery became an obsession discussed day and night, during meals and in the privacy of individual rooms. Sometimes discussions turned to arguments and momentary anger that required defusing by the board president. Everyone felt too close to the tragedy, sympathizing and identifying with the lost pilot.

Hypotheses, speculations, pet theories and wild guesses were each analyzed and reanalyzed. Night reenactments, evaluations, logical deductions, and analysis reports from scattered

laboratories provided hard evidence which eliminated theories and focused the board's efforts towards the revealed causes of the crash. The collage of data was carefully sorted. Teardown of flight controls and instruments indicated the airplane was functioning normally without apparent malfunction. The records of both the pilot and the aircraft reflected a marriage of man and machine equal to the challenges of the night mission. Reenactment flights demonstrated that while the mission profile was challenging and potentially dangerous, it was well within the capabilities of the mishap pilot. Had he honored the basic rule of nighttime flying—constantly crosschecking flight instruments—the mission should have ended routinely. The facts revealed that this accident was not unlike several others; this was not the first experienced pilot deceived into the ground at night.

On the nineteenth day of the investigation, the colonel had directed everyone to take Sunday off, relax and return the following day ready to organize findings and think about recommendations. Although everyone rested, few relaxed. Most reread testimonies, laboratory reports, and previous mishap summaries provided by the Aerospace Safety Center.

The following morning the board members gathered in the office temporarily allocated for their use, and began to conclude the findings of the investigation. The office door remained closed for many hours

before discussion ended and the members began to leave. The investigator remained behind. Alone, he reluctantly typed the findings that identified the cause: the mishap pilot failed to crosscheck his instruments while in a turn at night.

The sound of approaching footsteps interrupted the captain's thoughts. "Hello, sir," he greeted the colonel who was stepping around the shattered trees. "Did you find anything else?"

"No," the colonel answered as the two pilots turned and walked away from the crater. "Our investigation was pretty thorough."

Later as they drove away in their blue staff car, the captain commented: "I don't know, sir. It seems like the pilots we lose in accidents like this are our best."

The board president looked over and said: "Our trouble is that all of our pilots are great guys, too good to allow something like this to happen. But it doesn't take much. Spatial disorientation, visual illusions, self-confidence, allowing yourself to get distracted in the cockpit—even channelizing your attention outside too long—it can put you into the dirt in a hurry." ➤

Captain Hesselbein is the 549 TASTG's chief of safety. He has 1,800 flying hours in the OV-10 and A-10. The Kent State graduate also has 1,250 hours in Army helicopters including a Vietnam tour in Cobras.



# CHOCK TALK

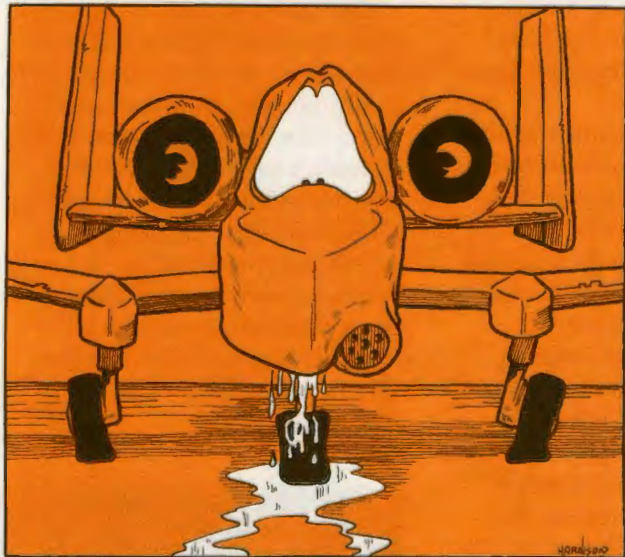
chock talk

Incidents and

## INCIDENTS AND

### Strutting the wrong stuff

When an A-10 returned to its parking spot after a mission, hydraulic fluid was leaking from the strut that supports the nose wheel. That night, some workers took the strut apart, repacked it with new seals and serviced it. Next day when the Warthog was about to taxi, the crew chief noticed the strut was bottomed out. Redball responded to his call with a shot of nitrogen until the strut *looked about right*. Hmmm.



After takeoff when the pilot tried to raise the gear, the nose wheel wouldn't come all the way up. When the pilot tried to lower the gear, the nose wheel wouldn't come down. His wingman told him the nose wheel was cocked and the tire

was rubbing against the wheelwell. Finally, after applying both rudder and 2 Gs, all three gear locked in place, but the nose wheel was still cocked. Fortunately, when the pilot touched down, the nose wheel straightened and the rollout was uneventful.

Troubleshooters found the nose strut extended about 10 inches, indicating overservicing. But when the nitrogen was bled out of the strut, guess what else they found—36 ounces of hydraulic fluid were required to fully service the strut. That's not the way to stop hydraulic leaks!

Actually, it wasn't a bad job of repacking a strut. But after that good work, the worker didn't follow through on the difficult chore of servicing the strut. Experienced hydraulic technicians say that A-10 strut servicing is easy to mess up if a worker isn't familiar with the procedure in the TO (-2-12MS-1). Looks like someone passed up a golden opportunity to call for help.

The decision to service the strut with nitrogen while the aircraft engines were running by the TLAR (that looks about right) method was expedient but not in accordance with any tech data that we know of. Charts and procedures were available but not used. When we sacrifice doing a job right for expediency's sake, the bills always come due—maybe not today and maybe not tomorrow, but somebody is going to have to pay the consequences. Sometimes it may only be a matter of raising a pilot's heart rate. But we can't count on always getting off that easy.



## INCIDENTALS WITH A MAINTENANCE SLANT

### All present and accounted for?

**A**fter an uneventful mission, a pair of F-106s returned home for landing. As the pilot of one of the jets pulled his throttle back for landing, he found that it wouldn't retard below 92 percent. Hmmm.

After a go-around and a long conversation with the SOF (supervisor of flying), the pilot lined up again and brought the Six in for landing again. This time, when touchdown was assured, he used the fuel shutoff switches to turn off the runaway motor. After blowing a tire and material failure causing a major part of the tailhook to be left in the arresting cable, the pilot managed to stop the aircraft in the opposite overrun. Good show.

Wonder what caused the stuck throttle? When troubleshooters had removed the ejection seat and floorboards, they didn't find a broken throttle cable or disconnected throttle linkage, they found a six-inch screwdriver . . .

All present and accounted for?

### Chief under glass

**"U**h, hello Ground, this is aircraft 419."  
"Aircraft 419, Ground, go ahead."

"Uh, you won't believe this, sir, but I can't get the canopy open. I'm trapped in here, and I would have been at chow twenty minutes ago. Could you send somebody over to spot number Able 12 to help . . . please?"



Such a conversation is comical to us, but have you ever wondered what it would take to get you out from under an F-16 canopy stuck closed with you in the driver's seat?

A crew chief was running an F-16 Falcon's engine to make sure the fuel transfer write-up had really been cleared and to check for proper canopy operation after the pressure seal regulator had been changed. The canopy seemed to be working OK and the fuel was transferring normally. So just before shutting down the engine, the chief tried to open the canopy. The actuator started and the canopy hooks began moving but suddenly stopped before releasing.

The chief shut down the engine and then tried to open the lid both electrically and manually. No luck. After some other workers responded to his call for help, they tried without success to



# CHOCK TALK

open the canopy from the outside. Everyone agreed that jettisoning the canopy wasn't a good idea; so they rounded up a circular saw and tried to cut out a hole for the crew chief who had now been trapped for four hours. But the saw blade became so hot that the material melted back together as soon as it was cut. Finally, the workers drilled overlapping holes in the canopy and formed a 20-by-20-inch escape path for the chief to climb through.

Rigging problems don't *always* show up as a canopy failing to close—it can also fail to open. Looks like we rediscovered how important canopy rigging can be.

## Stop distraction, I wanna get off

**A**n FCF pilot was putting his aircraft through its paces on a functional check flight following major maintenance. During one maneuver, he unloaded the aircraft to less than zero G and his ejection seat slid up the rails about three inches. When he returned to normal one-G flight, the seat slid back down where it should be. Sitting atop an ejection seat that's capable of (and threatening) taking the occupant on an exciting unscheduled ride is not a very comforting feeling for any pilot.

After the jet landed, troubleshooters found the attaching bolts that hold the seat to the catapult weren't installed correctly. Apparently, the technician who installed the seat, after doing some work along the floorboard, forgot to raise the seat to check the bolts for proper alignment. His supervisor never checked the alignment either. Before he reached that step, he noticed the canopy rigging was off. The canopy distraction took his full attention, and he signed off the work on the seat without thinking about it again.

Distraction. It's a disease on the flight line and in the air. Not only are we susceptible to distractions, we're often its victims. How do we recover from distraction? Only by double-checking the

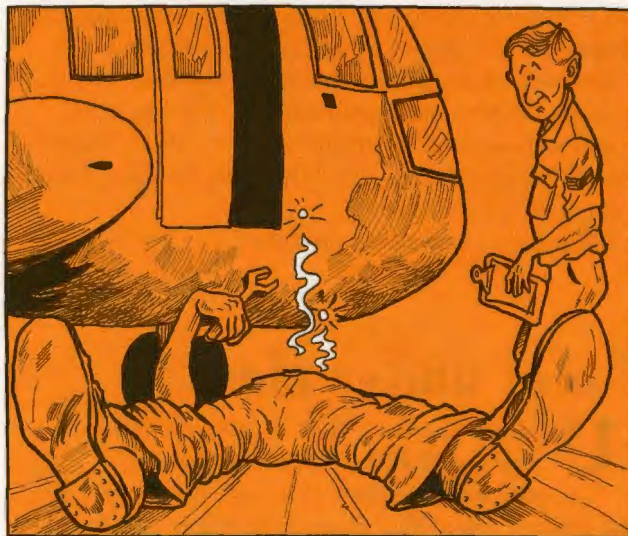
checklist or work card from the top down on every job. Time consuming? You bet. Worth it? Ask the pilot.

## It takes two

**A** veteran aircraft mechanic and his apprentice were tasked with changing the fuel probe inside the fuel tank of a CH-3 helicopter. Rather than hassle with having the 90-foot helicopter towed to the fuel cell dock, the twosome decided to do the work on the flight line. Their second mistake was choosing to ignore the fuel purging procedures in the TO.

By the time they succeeded in removing the malfunctioning probe, it was past supper time. So the older worker sent the younger one along to chow while he installed the new probe inside the fuel tank. Third mistake—the TO says this job requires two people. Wonder why—the work seemed easy enough.

About a half-hour later, another flight-line worker wandered by the helicopter and found the mechanic incoherent from the fuel fumes. He was beside himself beside the helicopter.



What if someone hadn't come by? Last year a similar corner-cutting incident resulted in a fatality.



# F-111



F-111 emergency situation training

## EMERGENCY SITUATION TRAINING

Maj Jon Jordan  
HQ TAC/SEF

**SITUATION:** You've just leveled your Aardvark at FL280, kicked two out to route, engaged the autopilot and settled down for the 45-minute cruise back to home plate. The range work went pretty well—two shacks and a couple of single-digit scores. You're trying to console the WSO on his two gross error radar bombs when you notice a Master Caution light for *fuel low*. A quick check shows 10,300 on the totalizer with 9,000 and 1,000 on the pointers. There's no major airfield (that you're aware of) for over 150 NM. OK, Sport, what's your initial move?

**OPTIONS:** **A.** Sliceback to that civil airport you saw off your left wing about two minutes ago. You don't know what facilities it has or how long the runway is, but a case of hot brakes sure beats a smoking hole after you flame out and eject.

**B.** Key the mic and ask center for a vector to the nearest airstrip with 6,000 feet or more.

Press-to-test the fuel gauge.

**C.** Check to see if the Fuel Pump Low Pressure Indicator lamp for standby pump one is lighted.

**DISCUSSION:** Option A would be viable if you truly had a critically low fuel state. That

would take two independent failures—fuel quantity indicating system and a massive fuel leak.

Since your wingman hasn't mentioned the latter, Option A is not a player. Option B isn't indicated for the same reasoning. Option C is a good start.

After assuring yourself that you have tons of fuel, your pulse can start back down from a figure approaching your WSO's CEA. Option D (which relates to the note under "Fuel Low Caution Lamp" in the Dash One) will further clarify the situation. The note advises that failure of boost pump one to provide fuel circulation through the reservoir tank will result in a small amount of trapped air in the wing carry through box. The air may expand, lowering the fuel level and tripping the Fuel Low light. If boost pump one's Low Pressure lamp is lighted, it all makes sense. Actually, even if it isn't lighted, you still don't need to worry; the same DC power used to light the lamp energizes the relay for the pump. So if that wire breaks or shorts to ground, the pump quits but the lamp won't light. In this case, a lamp test (different circuit) will still cause the pump lamp to light.

While it's uncomfortable flying home with a *Fuel Low* light staring you in the face, this does not constitute a hazard for positive G flight. ➤



# DOWN TO EARTH

ITEMS THAT CAN AFFECT YOU AND YOUR FAMILY HERE ON

## For your enjoyment and pleasure

**T**his summer don't become a weather statistic. A *warning* means seek shelter now, it's here; a *watch* means conditions are right for something serious to happen—watch out—you might have to seek shelter. If you're in a thunderstorm where there's lightning, a building or car is best. If you're out in the open, crouch low in a ditch touching as little ground as possible. Don't seek a solitary tree. If you find several trees, stand 6 feet from the trunk under the shortest one.

If you're swimming, get out of the water after the first crack of thunder and don't go back in until you haven't heard any thunder for at least 15 minutes and the sky is beginning to clear.

Flash floods can occur almost anytime without warning during a heavy rain, especially in an unfamiliar mountain campsite. Watch nearby water—if there's a rapid rise or an increase in water speed—go to higher ground.

When returning to your home after a flood, make sure the electricity is off before you step in any water, and don't light a match until you know the gas has been turned off.

You'll need more water and salt to combat heat stress if you work or play in the heat. And the lower the relative humidity, the cooler actual air temperature feels—don't be fooled—use a sunscreen.

Sun Protection Factors (SPFs) are indicated on all sunscreens, sunblocks and oils. The numbers range from 2 to 15. The higher the number the greater the protection. Here's how it works: if you start to burn after 20 minutes without protection, then using a lotion with SPF 2 means



you can stay out twice as long, or 40 minutes before you'll burn. An SPF of 15 means  $15 \times 20$  minutes, or 300 minutes (5 hours). Sunscreens are usually clear and can wash off when you swim or sweat. Sunblocks use metallic compounds, like zinc oxide. Zinc oxide is white; most people don't use sunblocks for that reason. However, unless they are rubbed off, sunblocks



## THE GROUND the ground



offer almost complete protection. And stay away from perfumed products, they attract bees. So do flowered shirts and hairspray.

If you come in contact with poison ivy, oak or sumac, immediately take a hot shower. The hot water breaks down the histamine cells (that's what makes you feel itchy); that may delay your skin's sensitivity to itching for about 8 hours.

Mayonnaise, meat, fish, eggs and milk products are not the best things to take on a picnic. If they aren't refrigerated, food poisoning can result.

When you barbecue, never use any chemical but charcoal lighter to start the fire—that means no gasoline or kerosene.

Protect your home from burglary when you go on vacation by making it look as lived in as possible. Have newspapers and mail picked up, turn on a light, park a car in the driveway or have a few bags of trash put out on trash day.

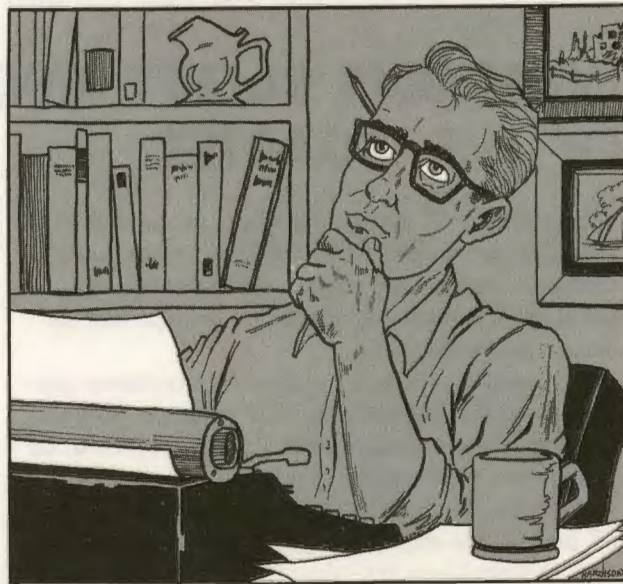
If you're a biker, go with the traffic, not against it. Wear something bright so you can be seen. If you go boating, hiking or camping, let someone know where you're going and when you expect to return.

Learn to swim: two out of three people who drown couldn't swim and never intended to be in the water; about 70 percent of the estimated 8,000 drownings each year are alcohol related. If you're on a boat, always wear a personal flotation device (PFD), whether you can swim or not. And don't dive where there's a "no diving" sign, if the water is less than six feet deep, or in an above-ground swimming pool.

Now go have some fun.

## Add

**H**ey, you're doing a great job out there on the ground. In 1984, 99.8 percent of TAC's military members were injury-free on the job; civilians, 98.8 percent. And off-duty, the injury rate for military members was only 1.2 percent. Pat yourselves on the back, have another cup of coffee and sit down and write us an article. Let



*TAC Attack* tell your story, either how you're doing it safely or how you didn't do it safely. If you don't want your name published, OK. But if your feature article is published and you want a T-shirt, we'll need it. Please send your article(s) to *TAC Attack* Magazine, TAC/SEP, Langley AFB VA 23665-5001. And if you have an idea and need encouragement, call us at AV 432-3658.



## GROUND SAFETY AWARD OF THE QUARTER

**M**R. RONALD E. ROSZKOWIAK has one of the best safety programs for an exterior electric shop in the command. During a recent inspection, Mr. Roszkowiak's comprehensive safety program received high praise.

Mr. Roszkowiak ensures that all his people are periodically briefed on job safety, and requires his workers to double-check each other's safety practices. His comprehensive safety program includes emergency first-aid and CPR training, state-of-the-art safety practices for high-voltage power distribution, a recurring checklist of dielectric tests on high-reach equipment and the proper use of personal protective clothing, such as rubber gloves and blankets. He makes sure all hot-sticks are regularly tested and that all equipment is clean and in the best working condition.

Because of Mr. Roszkowiak's enthusiasm for safety, his people work with confidence that their



**Mr. Ronald E. Roszkowiak**  
832 CES, 832 CSG  
Luke AFB, Arizona

job is safe. His program is effective: the electric shop has a near-zero accident rate.

## WEAPONS SAFETY AWARD OF THE QUARTER

**S**SGT DAVID T. RASMUSSEN has proven to be invaluable to the 347 TFW for his involvement in weapons safety and explosives ordnance disposal (EOD) training: the EOD branch has an accident-free record.

Sergeant Rasmussen instructs munitions personnel on the identification of hazards, precautionary actions and demolition procedures to be used when performing emergency destruction of munitions. To date, he has successfully trained 67 people. He expanded the emergency destruction of munitions training program by developing a slide presentation. During the last three months, Sergeant Rasmussen has given his briefing to Georgia law enforcement agency personnel which provided information to aid them in their fight against drug traffickers.

His greatest contribution to safety is the demonstrations he gives to weapons loading, conventional munitions maintenance, aircraft maintenance and flight crew personnel on the hazards

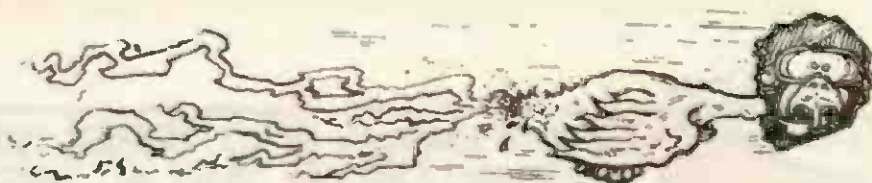


**SSgt David T. Rasmussen**  
347 EMS, 347 TFW  
Moody AFB, Georgia

of accidentally firing 20mm, 30mm, BDU-33 practice bomb, aircraft flare or other explosives components.



# TAC TALLY



CLASS A MISHAPS
AIRCREW FATALITIES
TOTAL EJECTIONS
SUCCESSFUL EJECTIONS

TAC		
APR	THRU APR	
	1985	1984
1	6	6
1	3	8
0	4	5
0	4	5

ANG		
APR	THRU APR	
	1985	1984
2	4	2
2	2	1
1	3	1
1	3	1

AFR		
APR	THRU APR	
	1985	1984
0	0	0
0	0	0
0	0	0
0	0	0

## TAC'S TOP 5 thru APR 85



TAC FTR/RECCE		
class A mishap-free months		
33	405 TFW	(F-15) Luke AFB, AZ
27	1 TFW	(F-15) Langley AFB, VA
26	33 TFW	(F-15) Eglin AFB, FL
24	23 TFW & 366 TFW	
23	49 TFW	(F-15) Holloman AFB, NM

TAC AIR DEFENSE		
class A mishap-free months		
147	57 FIS	(F-4) Keflavik, Iceland
100	5 FIS	(F-15) Minot AFB, ND
97	48 FIS	(F-15) Langley AFB, VA
56	318 FIS	(F-15) McChord AFB, WA
47	87 FIS	(F-106) Keesler AFB, MS

TAC-GAINED FTR/RECCE		
class A mishap-free months		
156	188 TFG	ANG(F-4) Ft Smith, AR
148	138 TFG	ANG(A-7) Tulsa, OK
147	917 TFG	AFR(A-10) Barksdale AFB, LA
125	114 TFG	ANG(A-7) Sioux Falls, SD
114	183 TFG	ANG(F-4) Springfield, IL

TAC-GAINED AIR DEFENSE		
class A mishap-free months		
130	177 FIG	ANG(F-106) Atlantic City, NJ
96	125 FIG	ANG(F-106) Jacksonville, FL
79	119 FIG	ANG(F-4) Fargo, ND
63	107 FIG	ANG(F-4) Niagara Falls, NY
54	147 FIG	ANG(F-4) Ellington AFB, TX

TAC/GAINED Other Units		
class A mishap-free months		
189	182 TASG	ANG(A-37) Peoria, IL
173	110 TASG	ANG(A-37) Battle Creek, MI
169	USAFTAWC	(many fighters) Eglin AFB, FL
161	84 FITS	(F-33) Castle AFB, CA
103	552AWACW	(E-3) 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	2.5														
	1984	3.4	4.3	3.3	2.5														
ANG	1985	4.8	4.8	3.0	4.5														
	1984	0.0	2.3	1.5	2.2														
AFR	1985	0.0	0.0	0.0	0.0														
	1984	0.0	0.0	0.0	0.0														

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



