

TAC Attack

NOVEMBER 1991



USAF Photo by SMS Boyd Belcher

ANGLE OF ATTACK



Where are we now, and where are we going? For a historical perspective on where we are today, let me take you back in time. Forty years ago Tactical Air Command had an average class A flight mishap rate of 25.2 with training losses almost equaling combat losses in Korea. Now for those of us who weren't around 40 years ago, or just can't remember that far back, how about five years ago? TAC ended FY 87 with a 2.9 class A flight mishap rate. And presently? We just completed FY 91 with a class A flight mishap rate of 2.0--a TAC all-time best, and a 31 percent reduction from FY 87. Our ground mishap results were equally impressive--a 34 percent overall reduction compared to last fiscal year. During Desert Shield/Storm, munitions personnel handled over 85 million pounds net explosives weight with 0 class A explosives mishaps and only 1 class B.

Despite incurring losses and having mishaps, overall, I would rate FY 91 as the best year TAC has ever had in safety. Who deserves the credit for this? YOU DO! Each and every member of TAC and their families who support them so well.

Unfortunately, there is a downside to our efforts -- we are still losing people and assets. In all three safety disciplines (flight, ground, and weapons), human factors are the predominant causes of mishaps. Nine of our 13 flight mishaps were attributed to human factors. Just think about it; 5 aviators and 10 airplanes lost due to human factors.

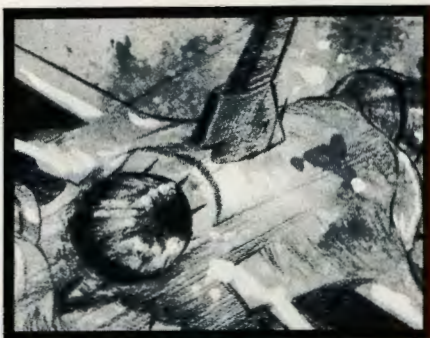
Reducing human factors mishaps requires everyone's attention and effort. Waiting for the Human Factors Engineers to solve the problem won't work. No matter how hard they try, they'll never totally solve it. In the meantime, we all have a responsibility to work toward eliminating human factors as a mishap cause. Before we do something, each of us should ask ourselves, "Does this make sense?" If it doesn't, we probably shouldn't be doing it. More importantly, when we observe others doing something that doesn't make sense, we should speak up. Let everyone know that something isn't right or doesn't pass the "common sense" test. If we let things slide, are we not increasing the risk of yet another human factors mishap? We should apply the same common sense test to everything we do. If it doesn't make sense, don't do it!

Our culture of safety is real! Folks are actively doing things the safe way because it is the right way to do business. The quality of your safety efforts over this past year, both on and off the job, has been truly remarkable. With dedicated TAC professionals continuously seeking to improve our culture of safety, I'm looking forward to FY 92 being even better. Thank you for a great year! Happy Thanksgiving!

BODIE R. BODENHEIM, Colonel, USAF
Chief of Safety

TAC Attack

DEPARTMENT OF THE AIR FORCE



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HON DONALD B. RICE
*SECRETARY OF
THE AIR FORCE*

GEN JOHN M. LOH
COMMANDER

COL BODIE BODENHEIM
CHIEF OF SAFETY

LT COL "NELLIE" BEARD
EDITOR

LT COL SCOTT WALES
ASSOCIATE EDITOR

JANET GAINES
EDITORIAL ASSISTANT

RON SMITH
ART DIRECTOR

SGT MARK S. BAILEY
STAFF ARTIST

STAN HARDISON
CONTRIBUTING ARTIST

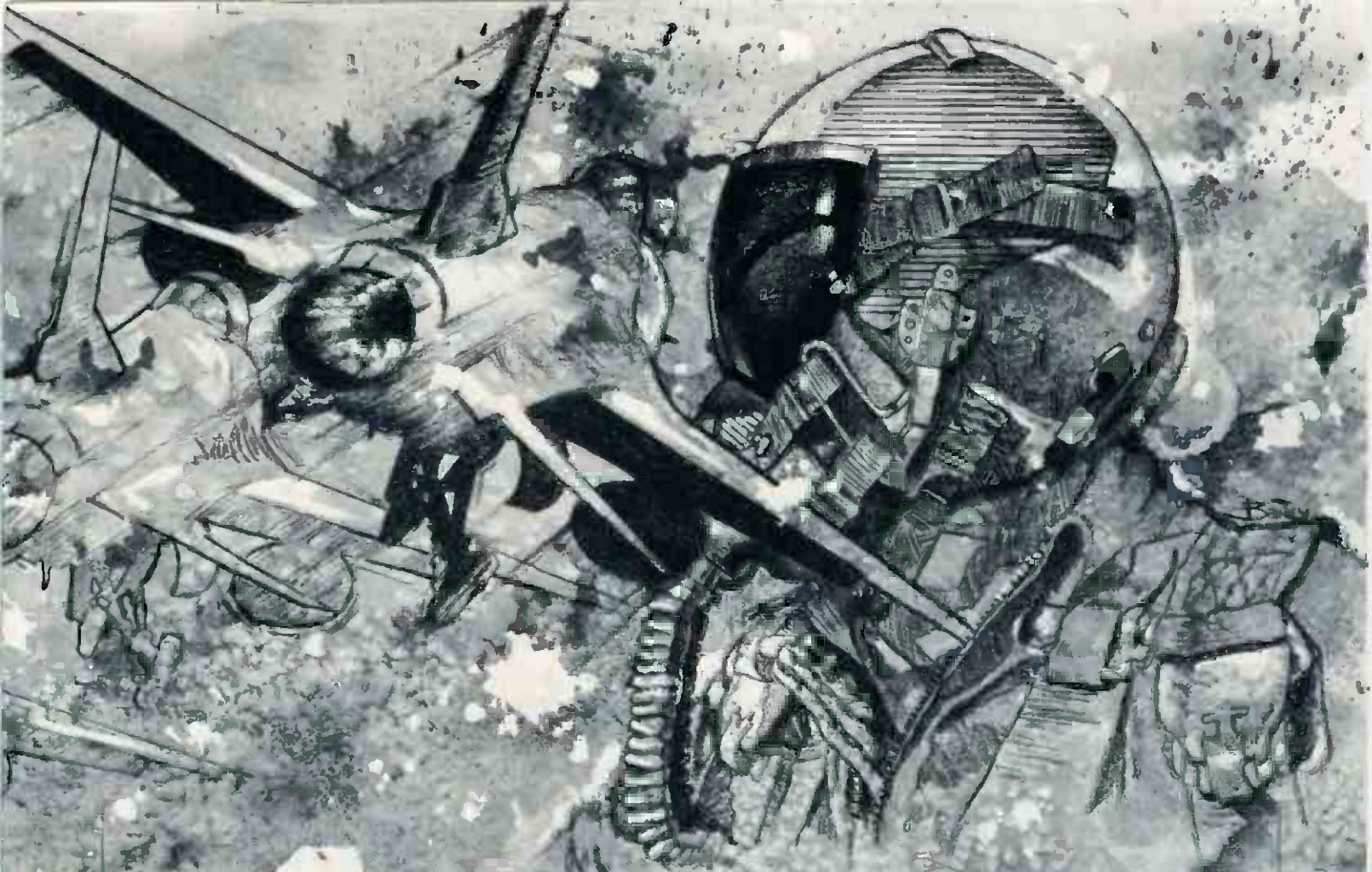
NO EXCUSES!

By Joe Bill Dryden
Senior Experimental Test Pilot
General Dynamics

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Okay, sports fans, here it is. We In Safety have seen a disturbing trend toward "out-of-control" incidents in the F-16, particularly in the F-16A/B community. The following article by Joe Bill Dryden says what I really want to; only difference being, he is more knowledgeable and eloquent in saying it. Please read and enjoy in the manner intended—as a medium for **MISHAP PREVENTION**. See ya around the flagpole!

Maj Ralph E. Gardner
HQ TAC/SEF



All right, you F-16 drivers. No excuses for losing control of an F-16. This fact, though well punctuated on these pages in the past, hasn't kept my compadres in our safety department from passing me reports of some of you losing control. In some cases, this had led to the loss of an aircraft (three in the last two years). My immediate response is to dust off some old copies of Code One and do a little clenched-fisted highlighting. For those of you who've misplaced your back issues, here's a refresher on maintaining control and what to do when you've lost it.

In the first five issues of Code One, I offered a series of articles for your enlightenment and, of course, your reading pleasure. In

that series, called "Semper Viper," I went into some detail about the radical design of the F-16 - its use of negative stability in particular. The airplane is designed to be negatively stable in pitch. Its computer-controlled flight control system uses all the good parts of negative stability and keeps all the bad parts in check. This was a radical departure (pun intentional) in aerodynamics and flight controls, and it gives the F-16 some unique characteristics. That gets me back to the topic at hand.

The most important thing to remember about the F-16 is that it will not depart if you don't get too slow. But being slow does not guarantee a departure! You must still inject a large degree of

ham-handedness before you will depart. The last thing I want to see is a knee-jerk reaction of establishing some minimum airspeed on F-16 maneuvering. While it is not too smart, tactically, to fly slow, you can continue to point the lift vector even when the airspeed is off-scale low. (It is not a very big lift vector under these conditions, but you can still point it to make the aircraft go where you want it to go. You just won't go very fast in that direction until you get some smash.)

In "Semper Viper," I also went to some lengths about the limiters in the F-16 flight control system. The limiters keep an unstable aircraft under control. If you're slow (both airspeed and mentally) and you make some

While it is not too smart, tactically, to fly slow, you can continue to point the lift vector even when the airspeed is off-scale low.

sort of gross or rough input, the flight control computer will try to honor your request. However, it immediately senses that the airplane will depart control as a result. Even though you keep pulling or rolling, the flight control computer has reversed the control input (sometimes all the way to the opposite stop). Because you are slow (airspeed only in this case), the control surface doesn't have enough authority to maintain the control it desires. So the aircraft departs. This situation is **your** fault, not the airplane's.

What are some of the cues you should be looking for? If the airplane is buffeting, you're slowing down. (The altitude or power setting doesn't matter. If you are in buffet, you are slowing down.) The airplane will fly very well deep into buffet, so don't be afraid to pull if the situation dictates. Just remember, to turn in this situation, you must give away energy (airspeed). Before any of you point out that you can maintain this or that altitude/G combination, go back and take another look at that same combination and you will find

that the angle of attack is too small to produce buffet. A little more alpha and buffet appears, and you start to give away airspeed. The same holds true if you are flying vertical, or near vertical. In my previous articles, I went into greater detail as to why. For now, accept the fact that you will slow down if you try to go vertical for very long. (You can't escape the laws of physics, even in an F-16. But you can come closer than in any other jet.)

So, you've been paying attention and know that you're slow (airspeed for sure, maybe mentally). It may help to sneak a peek at the HUD. Still, if you're aware of the cues peculiar to the F-16 (and I've discussed these a time or two in the past), you should never be surprised that you're slow. If you are slow and the aircraft is not going where you want it to go, it's no big deal. Simply allow the flight control limiters to do their thing, and you will get where you want to go without any undue dramatics. How? Be smoooooth!

Smoooooth (that's five o's) doesn't necessarily mean slow.

There's a subtle difference between the two words. If you know that you're slow, and you want to pull or roll the aircraft, then do exactly that. The input should be simply "and pull" or "and roll." (More about defining "and" in a second.) It shouldn't be **pull** or **roll**. It shouldn't be "and pull/roll" or "and roll/pull." In other words, don't assault the two limiters at the same time.

Speaking of time, you might ask, "How long is an 'and'?" The answer depends on your airspeed. At 600 knots, it might be 0.001 second. At less than 100 knots, it might require almost a full second of input. You want to let the flight control system know the input is coming, allowing it to make complete use of its limiters.

Figure 1 gives you a better idea of what I'm talking about. The upper line represents any of the limiters in the flight control system. It could be the AOA limiter or the roll rate limiter. If you make a brutal input, the aircraft immediately tries to honor the request. If you have sufficient airspeed (energy) in the airflow around the control surface, you might see a slight

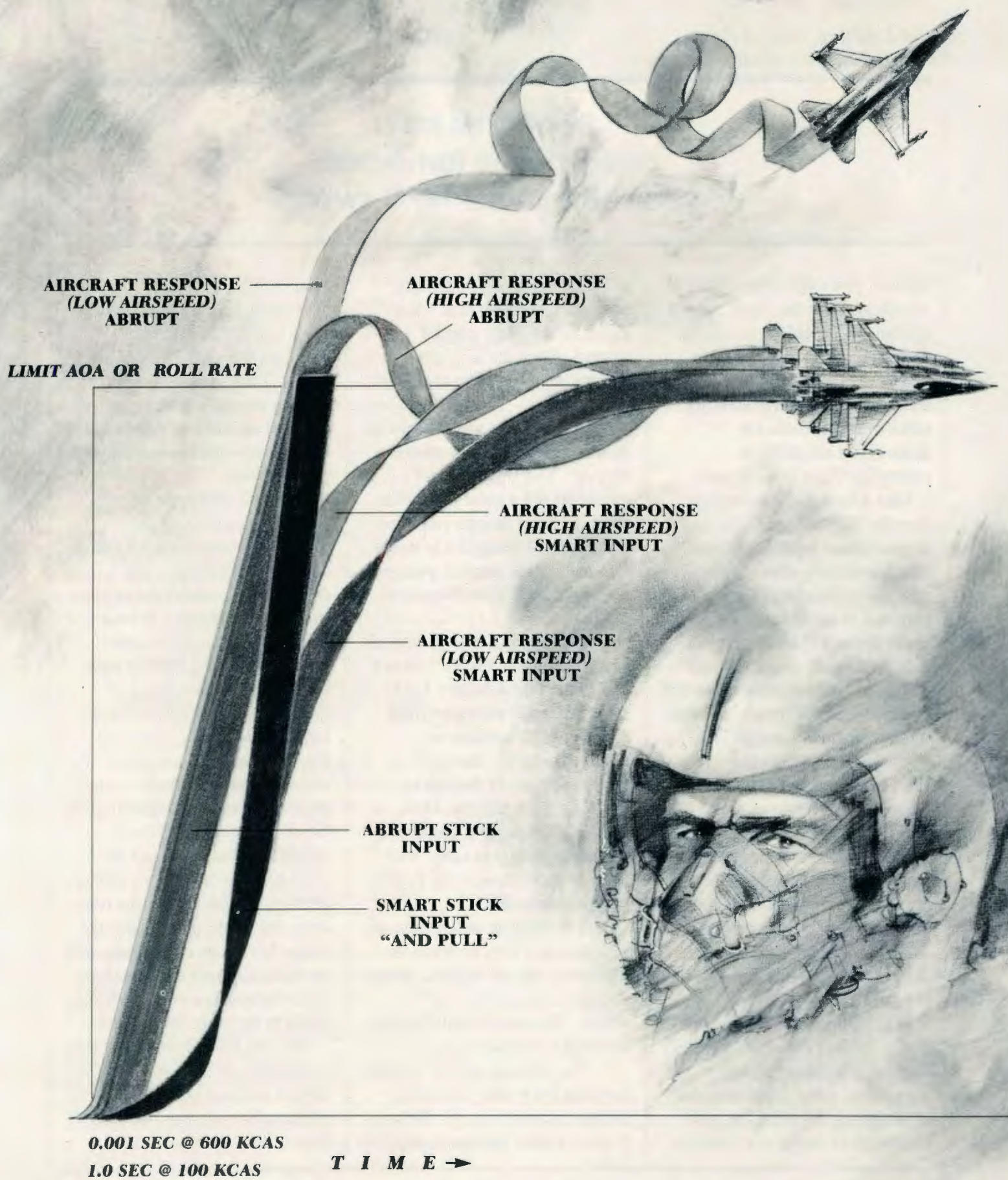


Figure 1

Don't wait for a deep stall to familiarize yourself with the MPO switch.

surface, you might see a slight overshoot. But the flight control system can quickly return to the desired limit. If you are slow, you'll have a gross overshoot. In this case, the negative stability takes over. All bets are temporarily off as far as controlled flight is concerned.

Take a look at the smart input line that I describe as "and pull." If your initial input is smooth (and technically slow) for the first few nanoseconds, you can continue to accelerate your input in the desired channel. Notice that the aircraft response is different since we have given the control system a "heads-up" that a large input is coming. The flight control system knows the limit is there and starts backing off to avoid overshooting it. If you fly the airplane in this manner, it is nearly impossible to depart. The only exception: you are nearly vertical and the airspeed truly goes to zero. When the aircraft falls backward for a short time, it is possible to depart.

In addition to the occasional screw-up with the airplane nearly vertical, you heavy-handers may experience some departures due to rough control inputs at low airspeeds. Despite my words of

wisdom, some of you are still going to make less-than-ideal inputs to the flight control system. Once the airplane departs, it will behave in one of four ways:

1. The airplane will recover on its own. It desperately wants to recover. The flight control engineers did a good job in this respect. Even though you have just departed a negatively stable airplane, it will recover without your help more than 80 percent of the time.

2. The airplane will go into an erect deep stall. Figure 2 shows that in the 50-60 degree AOA range, the total moments (read forces) on the airplane are essentially zero. Therefore, if you do something foolish to force the F-16 past the AOA limiter of 29 degrees and arrive in the 50-60 degree range with little or no pitch rate, the F-16 is happy to stay there.

3. The airplane will go into an inverted stall with no rotation. The other side of Figure 2 shows a location similar to Case 2 above. The aircraft will behave inverted as it does erect.

4. The airplane will go into an inverted deep stall with some amount of rotation. (In "Semper Viper," I went into some detail

as to why.)

So, now, how do you recover?

In Case 1, do nothing. Consider yourself lucky. Go home. Take some time to explain to yourself how you screwed up and don't do it again. Share your experience with your pilot bubbas.

In Case 2, you must do something to recover the airplane. Watch what it's doing in the pitch channel -- the channel that makes your eyes go straight up and down in your head. Ignore any inputs that make your eyes go left or right and ones that make them go clockwise or counterclockwise (usually all three motions are present in various amounts). To recover, you must reinforce the pitch oscillations. Depending on the configuration and the conditions that produced the deep stall, the magnitude of the pitch oscillations will vary from deep stall to deep stall. But the frequency of the oscillations will be fairly constant at about three seconds from one extreme (nose high) to the other (nose low).

Find the MPO switch. As I've mentioned in the past, you should practice locating this switch when it's less hectic in the cockpit. In other words,

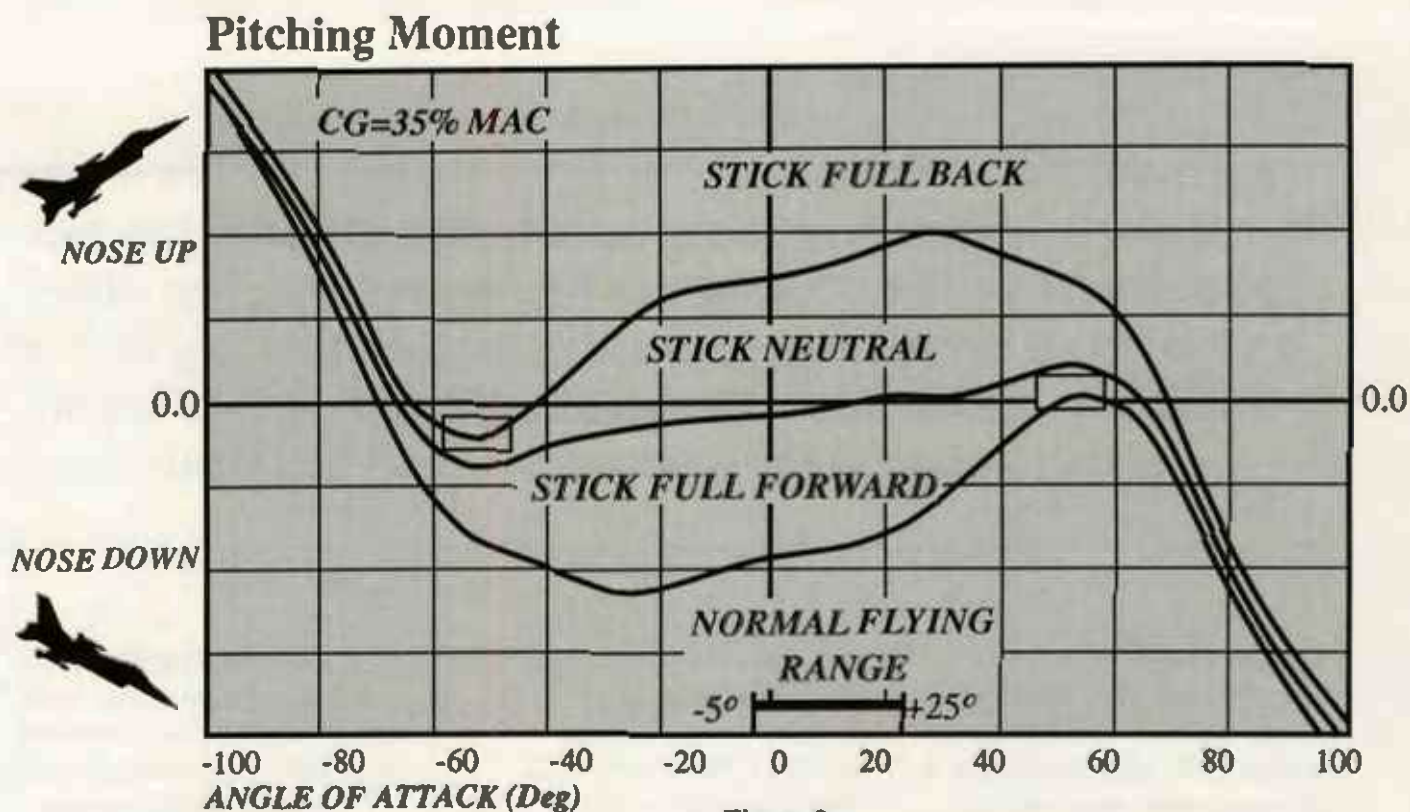


Figure 2

don't wait for a deep stall to familiarize yourself with the MPO switch location. Hold the switch outboard. When the nose is at its lowest point, pull back and hold. At the same time, the other side of your brain should start counting the seconds -- one thousand, two thousand... When you think the nose has reached its highest point and has reversed its direction, push and hold the stick. (The MPO is still outboard.) Check back with the other side of your brain. If it is just completing three thousand, you're doing it right.

A common mistake is to try to do the pitch rocking too fast. (Your body clock is usually running about 10 times its normal rate about now.) Another common mistake is to confuse a yaw or roll oscillation with a pitch increase. Remember what I said about your eyeballs. You should only be concerned with movements straight up and down in relation with your head. (Of course, I'm assuming you're sitting straight up. You are, aren't you?) Don't bite on yaw oscillations and pull when it's not called for.

As you push, the nose should pitch down, hesitate slightly, and then pitch farther down. You'll see the AOA gage break off the peg (32.5 +/- a little), and you'll be flying. If the nose reverses in pitch, pull the normal three seconds and repeat the process. As the nose pushes down and you've recovered, quit pushing so you don't pitch over on your back and enter a situation described in Case 3.

Case 3 is a mirror image of Case 2. Once you're sure that the airplane is indeed in an inverted deep stall (remember, it

For those interested in some nontextual training, the test pilot cadre here at the fighter factory has had an offer on the table since 1978 to provide a short briefing and a one-sortie program to show you all you need to know about keeping the shiny side up all the time.

wants to recover on its own), follow the sequence described above. To review: (1) MPO outboard; (2) when the nose is at its lowest point, push and hold the MPO and begin counting; (3) when the nose is at its highest point (inverted) and total time is three seconds, pull and hold! The nose will pitch down, and you should be flying again. Don't continue pulling and force the airplane into an erect deep stall. Just like before, don't confuse a yaw or a roll for pitch.

Some people would call Case 4 -- an inverted deep stall with some rotation -- a spin, but the marketing guys get upset with me when I do. Whatever you want to call it, your eyeballs will be traveling in a fairly constant direction left or right, rather than oscillating left and right. To recover, step on the opposite

rudder to stop the rotation. (Pitch rocking is usually ineffective if the airplane is rotating.) The airplane will usually recover on its own when you stop the rotation. If it doesn't, you have just entered Case 3. Recover the aircraft as described above, go home, and make sure you don't do it again.

For those interested in some nontextual training, the test pilot cadre here at the fighter factory has had an offer on the table since 1978 to provide a short briefing and a one-sortie program to show you all you need to know about keeping the shiny side up all the time. The sortie was designed by the test and operational pilots of the F-16 Combined Test Force at Edwards AFB. I've already trained pilots in two foreign air forces and am scheduled to fly with a third

soon. Alone, I have done more than 250 intentional deep stalls with these pilots and recovered all of them. Call me stallworthy.

The training sortie includes five maneuvers that, if you understand correctly, will ensure that you never depart the F-16. To make certain that all the bases are covered, I force the F-16 into a deep stall in four additional maneuvers so that you can recover the airplane. These maneuvers get your own references to match up with what I have been saying here about timing, sounds, sights, etc. One sortie will ensure that you'll never lose control of your jet. Give us a call and we'll take you for a spin, or rather, an inverted deep stall with some rotation.

Check six...and remember -- a departure won't improve your tactical situation.

Aircrew of Distinction Award



On 18 June 1991, Major Michael H. Weaver departed Greater Pittsburgh International Airport on a low-level surface attack mission. He was flying as number two in a two-ship flight of A-7s.

Twenty minutes after takeoff and approximately one-third of the way into the low level route, while flying line abreast formation, Major Weaver had only a split second to react to avoid a large bird. Instinctively, he began an immediate climb and ducked behind the glareshield/HUD; but it was too late. Flying at 300' to 400' AGL at 450 KTAS, his A-7 was struck squarely on the radome by a 5-pound turkey vulture.

The collision was violent. The radome disintegrated upon impact, producing a loud explosion, continuous noise and an immediate stench. As he was already climbing, Maj Weaver route aborted the low level, called a knock-it-off, and directed the flight lead to rejoin.

The situation deteriorated upon entering IMC conditions on the route abort at approximately 4000' MSL. The situation was compounded by erroneous airspeed and altitude indications, caused by physical damage to both pitot tubes. With the airspeed indicating 190 KIAS and decreasing in a 10

degree climb, Maj Weaver was still unsure of the engine and started preparation for a possible ejection.



Maj Michael H. Weaver
146 TFS, 112 TFG
Pittsburgh PA

The situation improved when Maj Weaver was able to ascertain normal engine performance by confirming a positive climb on the radar altimeter and valid ground speed via the nav/weapons delivery computer. Upon entering VMC conditions at 12,000' MSL, Maj Weaver declared an IFE, directed the flight to rejoin and obtained a block altitude from ATC for his return to Pittsburgh.

The flight lead, flying chase, reported the radome was missing. Upon seeing debris flying past the windscreen, Maj Weaver extended the Ram Air Turbine, again preparing for the possibility of ejecting. The throttle was set since engine FOD damage was suspected.

Contact was made with the A-7 SOF and recovery plans coordinated. Maj Weaver performed a controllability check 30 miles from Greater Pittsburgh with the flight lead confirming 160 KIAS as the minimum acceptable airspeed. The lead was passed for the IMC penetration and passed back to Maj Weaver upon reestablishing VMC conditions at approximately 4,000' MSL. A close-in precautionary landing pattern was flown to an uneventful landing.

Upon inspection, the engine was found to have suffered extensive FOD damage to the inlet extension casing, fan and both compressor sections. Engine failure was imminent.

The calm, methodical and expeditious handling of this emergency by Maj Weaver and textbook coordination between himself and the flight lead enabled him to avoid a potential disaster and earned him the TAC Aircrew of Distinction Award.

The Right Place, The Right Time

Maj Len Olson
Air Force Liaison
Crane Army Ammunition Activity
Crane IN

For a long time, I've been itching to tell folks how badly I think one of our most common safety maxims is misunderstood. I'm sure you've heard "Safety First" or Safety is Paramount" used to emphasize how important safety is to us. But has anybody told you what it does **NOT** mean? I think it's important to know in order to avoid misunderstanding.

Safety first does not mean that safety is more important than the mission. The mission is our top priority; it always has been and always will be. For years, safety people have used the phrase "maximum safety consistent with operational need" to explain the relationship between the mission and safety. I believe this can still lead to some serious misunderstandings.

Nobody ever says "safety first, consistent with operational need." Even if they did, I think there would still be problems. To me, "consistent with operational need" implies a conflict between the mission and safety. I've seen it in practice, mission planners and safety people often try to "balance" opposing requirements. It's not a very productive approach, and I think we can do better.

What we're really trying to do is get the mission done as safely as possible. So why don't we use that as our guideline for safety? Get the mission done as safely as possible. There's no conflict in that. We all have the same goal, and using language expressing a clear link to that goal will help eliminate misunderstandings. Safety

Safety first does not mean that safety is more important than the mission. The mission is our top priority; it always has been and always will be.

should to be seen as an essential part of the mission, not an obstacle that keeps us from getting it done.

Now, back to our adage, Safety First. When we say that, what do we mean? When we design a new weapons system, when we start a new job, when we start anything new, what's the first thing we think of? I

hope it's safety. When we write out procedures, when we work with something hazardous, when we just change the way we do things, is safety first on our minds? Again, I hope so. Safety should permeate everything we do right from the start. That's what safety first means to me—putting safety in the right place, at the right time.

I chose that for my title because I was afraid using Safety First would turn off potential readers—too many of them see an implied statement there putting safety ahead of the mission. Since they know better than that, they see it as a hypocritical statement. It worries me to see people with this attitude. Sometimes they just don't think we're really serious about safety. I've seen these attitudes get so far out of hand that a unit had actually written into their warplan that they would ignore safety rules. Not just waive them—**IGNORE** them. Sounds dangerous doesn't it? The absolute **WORST** time for a mishap is during combat.

So having said the mission is our top priority, let me add this: It is not an excuse to ignore safety. Safety must be an integral part of any unit's warplan; safety must be a part of the solution to those difficult



problems we face in combat. Sure, we are forced to do some things in wartime that we wouldn't try in peacetime, but we still need to get the mission done as safely as possible. We just cannot afford to waste valuable combat resources through mishaps.

History has been too generous with unfortunate

lessons that should have taught us long ago that safety plays an important part in preventing mishaps that result in the loss of lives and valuable resources. Some of those events have been so catastrophic that the mission was jeopardized or even failed. The 1980 hostage rescue attempt in Iran that ended in a crash in the desert is an

example. Our mission is too important for that kind of loss. That's why we should always push for the safest way to get the job done, even under urgent deadlines. It's how we put safety in the right place, at the right time. It's a case of safety first, the way we really mean it.





AN ALARMING INCIDENT

MSgt Francis S. Gore
363 EMS/MAEMCA
Shaw AFB SC

Sergeant Fast PCS'd into his new base and was assigned as a munitions storage crew member. He had been in the Air Force 6 years and was an exceptional troop. One day he was out at an igloo storing rocket motors. The crew consisted of himself and Airman Rush. Since Amn Rush was not qualified on driving a 6K forklift, Sgt Fast decided to drive with Amn Rush as a spotter. Half way through the operation, Sgt Fast realized he had filled out the crew book incorrectly. He told Amn Rush to go out to the truck and correct the crew book entry. While Amn Rush was out of the building, Sgt Fast continued to stack munitions. He was attempting to exit the igloo

with a box of 2.75 inch rocket motors when the boom of the forklift struck the alarm box bolted to the underside of the door frame. When the boom hit the alarm box, Sgt Fast hit the brake, causing the box of rocket motors to fall over four feet to the concrete floor.

Sgt Fast saw the box fall, and being an ammo troop, he knew what to do next: run! He pulled the emergency brake up, jumped off the forklift, and ran. The rocket motors ignited on impact and were burning while Sgt Fast was reacting. Amn Rush saw this happen and was about 20 yards ahead of Sgt Fast.

Once they were at the designated withdrawal

location, they could see smoke coming out of the igloo. They heard the sound of rocket motors burning, but no loud boom - yet! They called munitions control, fire department, and explosive ordnance disposal (EOD). Within eight minutes of the call, EOD had arrived on the scene and was briefed on the accident. The munitions area was evacuated, and it was not until two days later that EOD secured the area.

EOD entered the building to find that only the six rocket motors in the dropped box ignited!

drive to the right of the box with the forks tilted all the way back. The alarm box in this particular building had been knocked off four times in the past fourteen months. The shop chief was newly assigned to the base and wasn't aware of this hazard. It seemed that it was just one of those things that happened three or four times a year and no one ever did anything about it.

Sgt Fast obviously didn't know about this hazard; true, he should have used a spotter, but the real hazard was the low alarm box. Why had



There were 400 other rocket motors and 600 white phosphorous warheads in the igloo at the time. Amazingly, nothing else was destroyed; however, the building was a mess. The damage and cleanup cost was estimated at over \$3,000.

Sgt Fast and Amn Rush were questioned by the commander about what happened. They told him the story. When the commander asked Sgt Fast about the alarm box, Sgt Fast said, "I didn't know it was that low." The alarm box was so low that any 6K forklift boom would hit it, even when the boom was all the way down. The truck was to

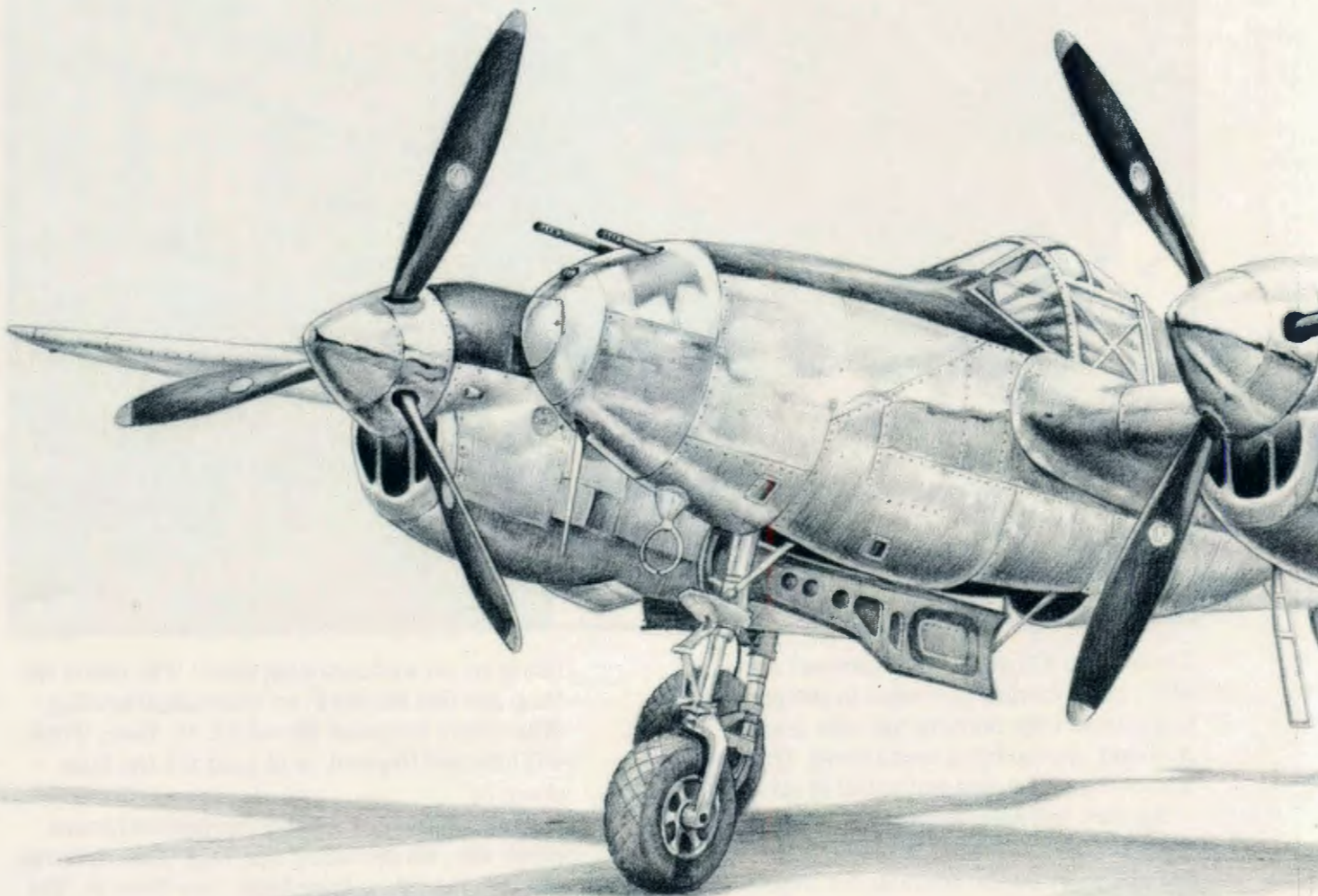
this gone on without being fixed? Why didn't the shop put this hazard in an orientation briefing? Why didn't someone fill out an Air Force Form 457 (Hazard Report), or at least tell the boss about it?

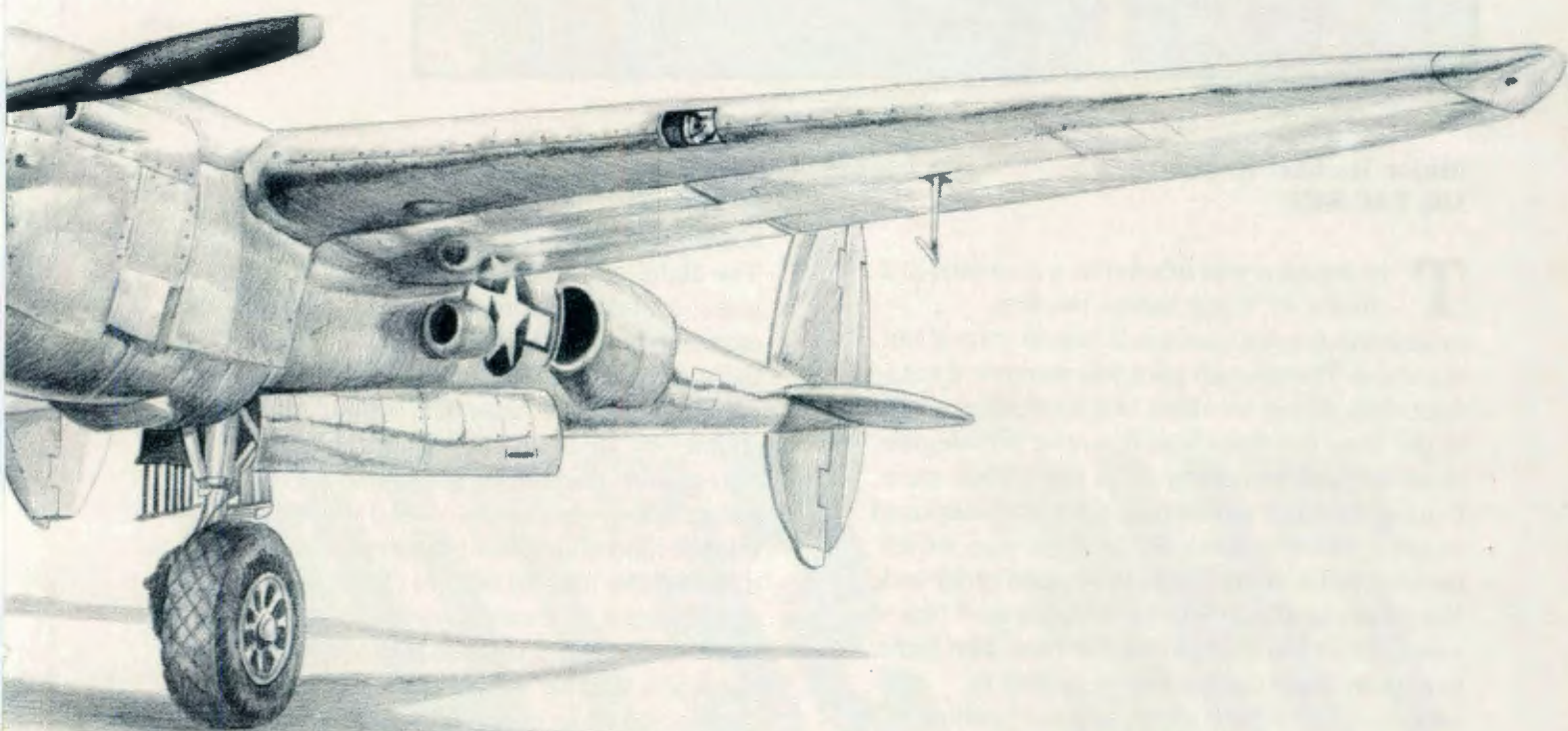
Many of us work around this type of hazard every day. We shouldn't overlook these hazards just because they have been here forever. The next time you're out working, look around. If there are hazards in your work area, report them. You may save someone's life!

P-38 LIGHTNING

was flown by the
48 Fighter Interceptor Squadron
from 1941-1945.

The 48 FIS was deactivated 4 Oct 1991.







Been there, done that The Setup

Major Michael E. Fox
HQ TAC/SEF

The mission was briefed as a standard 2v2 similar ACT; but before the first engagement even started, it was anything but standard. The mishap pilot was number 2 in the four-ship, flying an offset box formation. Once in the area, the flight lead directed a 90 degree G- awareness turn away from the mishap pilot. During the turn, the mishap pilot was supposed to get a systems check on his flight lead, which he was unable to do because of a bad radar lock. His preoccupation with the radar caused him to lose sight of his lead during the turn. The flight lead then directed another 90 degree G- awareness turn back to the original heading. The mishap pilot made an aggressive pull to avoid conflict with his lead, whom he still could not see. Once the turn was completed, both the flight lead and the element lead observed the

mishap aircraft roll abruptly to an inverted attitude with the nose of the aircraft falling to approximately 40 degrees below the horizon. The flight lead asked the pilot where he was going, and the pilot responded by saying he had experienced a little spatial disorientation. The flight lead then directed the pilot to rejoin to spread. Soon thereafter, the mishap pilot called "blind." By air-to-air TACAN, flight lead determined that his wingman was 4.2 miles away. The second element lead saw the mishap pilot behind and below his element and directed the mishap pilot to check right to help get him back in formation with his lead. The flight lead cleared the second element to their point and told his wingman to rejoin him at their point while deconflicting altitudes. The wingman soon regained visual and joined to spread. The flight lead asked his wingman how he was feeling and confirmed he was okay. The second element lead also made a radio call to

DONE THAT

the flight lead to make sure the mishap pilot was okay.

The mishap pilot asked to do another G-awareness turn prior to the first engagement. The flight lead directed a G-awareness turn into his wingman starting at 18,000 feet. After 90 degrees of turn, the flight lead observed the mishap aircraft roll inverted and the nose dropped to 70 degrees low with no observed attempt to recover. The flight lead made several radio calls to get his wingman to recover. The flight lead finally observed his wingman roll upright and pull out of his dive. The wingman recovered at 3000 feet over the water. The flight lead asked his wingman if he was okay, and he replied by saying he had experienced more spatial disorientation. At this time, the flight lead elected to discontinue the mission and take his wingman home. The flight lead led his wingman to an uneventful straight-in landing. The mishap pilot had experienced G-induced Loss of Consciousness (GLOC) during both G-awareness exercises.

The pilot had no history of GLOC throughout UPT, LIFT, or RTU and had successfully completed centrifuge training at Holloman. All life support equipment was inspected and found to be working properly. The aircraft G meter showed only 5.5 G's after the flight, so how could this have happened?

Now for the SETUP. The pilot's recent history revealed several factors that set him up for a possible GLOC:

1. When the pilot strapped in, he remembered handing his G-suit hose to the crew chief. He erroneously assumed the crew chief would hook it up. The crew chief reported he did not receive the G-suit hose. **The bottom line is that the G-suit was never connected.** The pilot failed to check the connection on the ground and because of poor habits did not check it prior to the G-awareness turns. The pilot actually believed he had spatial disorientation during the first series of G-awareness turns and never thought to check the G-suit connection after the first GLOC

episode.

2. **The pilot failed to use an effective straining maneuver.** This can be partially attributed to his lack of concentration on the G-awareness maneuver itself while trying to do a systems check and then trying to regain a visual after losing sight. During the second G-awareness maneuver, the pilot was probably more concerned with why he had experienced spatial disorientation during the first turns. This kept him from doing a good straining maneuver this time as well.

3. **The pilot stated that he had not exercised in three weeks.** You may think that you can perform in a 9 G capable jet without exercising periodically, but you are just kidding yourself.

4. **The pilot had only six hours of sleep the night before.** Sleep patterns affect people differently; and in some cases, six hours of sleep may be all a person needs. In this case, however, six hours of sleep was less than normal and could have contributed to the GLOC.

5. **Dehydration may have increased the GLOC risk.** The pilot stated that the only water he had prior to the flight was a sip from the water fountain.

6. **The pilot's diet was less than adequate for the 72 hours leading up to the GLOC episode.** An adequate diet is important to prevent fatigue which can lead to a GLOC.

7. The pilot had just completed a simulator checkride the day before and felt relieved to have that behind him. **His attitude the day of the mishap was relaxed, maybe even complacent. This may have contributed to a lack of concentration.**

Could this happen to you? Think about it. Any one of the above factors could have contributed to a GLOC episode. Together . . . All I can say is we were fortunate this time. Flying is a demanding mission and not one to be taken lightly. Prepare yourself both physically and mentally for each mission. Don't accept less than 100% from yourself. To do so is a crime against yourself and the people who work with and for you.

CLOSE

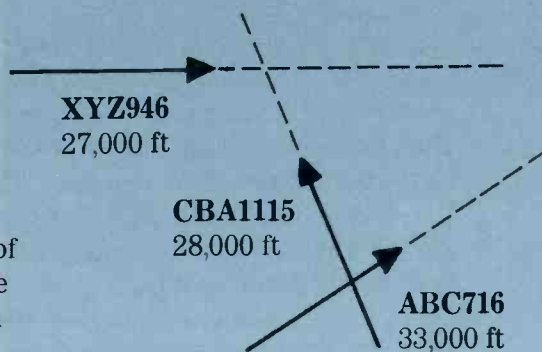


Mr. Ralph B. Priestley
FAA/TAC Liaison Officer
HQ TAC
Langley AFB VA

“D_____! THAT AIRPLANE WAS CLOSE!!” Blurted the Captain of XYZ Airlines Flight 946 after he banked his Boeing 727 to avoid a DC10 that descended across his flight path.

Why? How could this happen in the most advanced ATC

system in the world? Let's look at the sequence of events that led to this occurrence.



XYZ946 was eastbound maintaining 27,000 feet en route from Chicago to Pittsburgh.



YOU BETC

CBA1115 departed Charlotte and was northwestbound en route to Cleveland at 28,000 feet on a course that would cross the flight path of XYZ946. ABC716 was eastbound at FL330 en route to LaGuardia, New York. The flight crew of CBA1115 was nearing the point that they would normally be cleared for descent.

1. ATC issues a clearance to ABC716 to descend to 25,000 feet. "A-B-C seven sixteen descend and maintain flight level two five zero."

2. The flight crew of CBA1115, anticipating a descent clearance, acknowledges for the clearance issued to ABC716. "Descend to two five oh, eleven fifteen."

3. The flight crew of ABC716, hearing CBA1115 acknowledge for the clearance, assumes that the clearance was actually for CBA1115 and, therefore, does not respond.

4. The air traffic controller hearing the acknowledgement does not recognize the incorrect

(incomplete) flight response.

5. CBA1115 descends across the flight path and through the altitude maintained by XYZ946.

THE REST YOU KNOW...

AND A SIMILAR SITUATION HAS OCCURRED.

What caused this incident?

1. Similar call signs.
2. Anticipation of a descent clearance by the crew of CBA1115.

3. Failure of the CBA1115 crew to acknowledge with a complete call sign.

4. The assumption by the ABC716 crew that the clearance was not for them.

5. Failure of air traffic control to recognize the incorrect call sign in the readback.

A communication/readback survey conducted for a five-day period by ATC facilities throughout the United States documented 7,000 incorrect readbacks. The errors included altitude, frequency, heading/route, crossing point, altimeter, speed, accepted

clearance for another aircraft, and others. Errors were made by all users of the ATC system including air carrier, general aviation, air taxi and the military. Air traffic controllers corrected errors accordingly. Few errors, and I emphasize **FEW**, were missed. During the five-day survey, 14 operational errors (an incident when required separation was compromised) were reported across the country. One of the 14 reported operational errors was the result of a communication/readback error. Overall for the past year, 15 per cent of all operational errors were related to communication/readbacks.

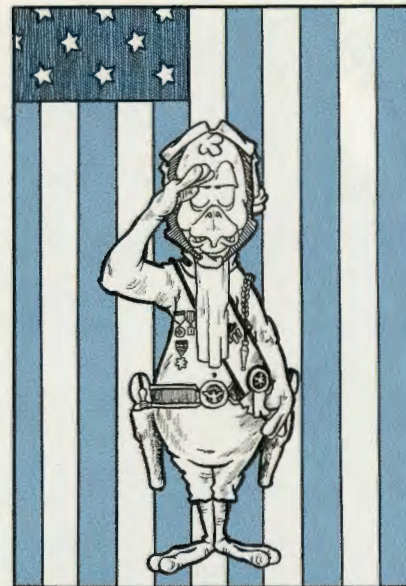
Communication/readbacks are a vital segment of the air traffic control system. We all must be aware that communication/readback errors are occurring in great numbers. We must recognize that any communication/readback error is a potential catastrophe. All of us, pilots, terminal controllers, flight service station specialists, ARINC operators, en route controllers, instructors, and certifiers, need to respond in our own individual way to resolve the problem.

BE AWARE, USE COMPLETE CALL SIGNS, VERIFY IF IN DOUBT, LISTEN, QUESTION, MAKE SURE! . . .

Let's all work together to reduce communication/readback errors.

FLEAGLE SALUTES

TAC'S OUTSTANDING AIRMEN



Master Sergeant Thomas W. Norton, 334 TFS, 4 WG, Seymour Johnson AFB NC, was the 334th Aircraft Maintenance Unit safety monitor from Feb-Apr 91. He voluntarily assisted the 334 TFS ground and motorcycle safety monitor from Apr-Jul 91. During this period, he demonstrated his dedication and professionalism by ensuring that a sound safety program was maintained during the turbulent times associated with the reorganization of the 4th Wing. This reorganization took effect in April and combined the 334 AMU with the 334 TFS, blending their safety programs together. During this reorganization, he provided much needed advice and assistance to the 334 TFS ground safety officer. In addition to his safety related duties, he was the 334 AMU mobility NCO, plans monitor, SORTS monitor, NBC representative, AMU cleanup supervisor, alternate

CAMS monitor, alternate suggestions monitor, and alternate training monitor. Despite this myriad of additional duties, he has consistently maintained a noteworthy safety record. During this period, the 4th Aircraft Generation Squadron won the 4th Wing Ground Safety Award for industrial safety. The 334 AMU and MSgt Norton played an integral role in this accomplishment. During Feb 91, AGS received its annual safety inspection performed by 4th Wing Safety. The 334 AMU was inspected for ground and weapons safety as part of this inspection with no reportable deficiencies noted from the 334 AMU. He promotes the designated driver program and monitors seat belt compliance for the 334 TFS both on the flight line and in the parking lots. He is currently working with the building custodian, wing safety, the fire department,

and civil engineering to correct a serious safety deficiency in the design of aircraft maintenance hangar doors in the 334 TFS maintenance bays. For his consistent quality performance, Sgt Norton receives a **Fleagle Salute**.

Staff Sergeant Henry E. Panaligan, 58th Component Repair Squadron, 58th Tactical Training Wing, Luke AFB AZ, recently assumed responsibility for a low-key squadron safety program and revitalized it into a quality program with all shops participating. The program affects over 230 military and civilian personnel in 16 duty sections. In January, Sergeant Panaligan reviewed the squadron's previous year's mishaps, compiled the causes and corrective actions, and

published a report in an easy to read format for all shops to review. This report became the forum for shop discussions during safety meetings. Numerous shop discrepancies were identified and corrected throughout the squadron due to his cross-talk report. Throughout this period, Sergeant Panaligan focused on squadron mishaps and created weekly safety briefings

addressing prevention of those mishaps. When the squadron experienced a sharp rise in small hand-tool mishaps, Sgt Panaligan thoroughly investigated each incident and researched preventive education materials. As a result, a concise hand-tool safety briefing was published. Since its release, the squadron has not had a single hand-tool mishap. The final proof of Sergeant

Panaligan's efforts is the rating received from the 832 AD Safety Office on its annual inspection. The safety program was rated "Excellent" overall with the management and Safety NCO being rated "Outstanding." They cited Sergeant Panaligan's efforts as one of the most active programs they have seen. Sergeant Panaligan's performance earns him a **Fleagle Salute.**

WANTED



"TALES FROM THE DESERT"

ALL CATEGORIES NEEDED.
SO MUCH TIME IN THE SANDBOX;
AND NO SAFETY STORIES?

Phys Bizz

The "Failing Aviator" Syndrome

WGCDR Graeme R. Peel, RAAF
HQ TAC/SGPA
Langley AFB VA

Stress affects us all and fliers are no exception. Unfortunately, the consequences are more severe for aviators. A working definition of stress is: the reaction of the body to outside stimuli which are strong enough to require adjustment. Such stimuli are termed stressors, and these and the accompanying reaction are strictly personal in nature. That is, stress may be manifested as tension or discomfort in one individual while simply appearing as increased motivation in another. There are no good methods to evaluate the relative significance of stressors. Apparently minor problems may be as significant in terms of results as major disasters, depending on the individual.

Nonetheless, the time may come when an individual is confronted by overwhelming stressors and the result, especially in the aviation community, can be disastrous. For this reason fliers have long been the subject of special study, and a condition known as the "failing aviator" syndrome has been identified.

In this condition, a flier is confronted by acute situational factors when his coping abilities are diminished, and an increased potential for a mishap ensues.

There are many environmental stressors; but for ease of discussion they can be placed into four general groups; personal, family, social, and work-related. Personal stress includes inherent personality traits (as modified by experience) such as extroversion, the need to always be in control (not unusual in aircrews), or obsessive features. Family pressures may range from illness of a spouse or child to interpersonal conflicts. Social stressors include such factors as financial and moral pressures and a hectic lifestyle. In the work-related category, example elements are career competition, job difficulty and overwork.

Changes observed due to stress include excesses in routine habits: eating, drinking and smoking, agitation, aggression and irritability, retreat from social activities, fatigue, deteriorating or poor flying performance, and

increased risk taking. The loss of a sense of humor is a notable negative sign. The errors of judgement which appear in degraded flying skills are often of the omission or commission type, such as a failure to complete checklist actions or excessive channelization of attention.

Under "normal" peacetime conditions, aircrew stressors can be fairly predictable: Unfavorable conditions of service; frequent moves, relatively poor pay, constraints on flying hours; additional duties; the prospect of a staff job, etc. Such factors usually predominate, with family problems following. Unless unusual circumstances exist, and the stressors become overwhelming, most aircrew have sufficient capacity to adapt in a healthy way. Such causal human factors identified in aircraft mishaps are not always as common as other players. However, with a change in the game rules, patterns of stress and consequences are accentuated.

The stressors induced by Desert Shield/Storm were numerous. Problems observed in the field included family separation trauma, financial pressures, boredom due to inactivity and the many uncertainties associated with the future. The inability of fliers to control their situation was perhaps the greatest stressor faced.

For example: A pilot and WSO were lost when their aircraft flew into the ground during unauthorized and unsafe maneuvering. The pilot was an aggressive, self-confident individual with high motivation to succeed. Unfortunately his strong personality created difficulties in his duty performance; he adapted poorly to regulatory restrictions placed on his flying, since he considered that survival in combat required more realistic training than that being undertaken. He had recently been removed from his position as flight commander due to ongoing conflicts with squadron supervisors. In addition, he greatly missed his family and friends. There were several cues to alert his colleagues to his gradual succumbing to stress. These included increases in his anti-authoritarian behavior on the ground and in the air, irritability and deteriorating social contacts. The failure of supervisors and colleagues to

respond to the pilot's warning signs contributed to the loss of the crew.

Appropriate management of the "failing aviator" is one key to mishap prevention. The goal is to reduce tensions in the individual to allow for adequate coping. Recognition of a problem is the first step. This may be difficult in view of the subtle cues exhibited, a lack of opportunity to observe, the ability of many to deny or disguise the stress response and a lack of understanding of the situation by fliers and their colleagues. Suppression of identified stress may occur in a short-sighted attempt by fellow squadron members to "protect" affected fliers.

Once excessive stress is identified, fliers, just like other mortals, must accept personal responsibility for their well-being and actions. It is not enough to expect others to fully manage an abnormal stress response and provide the cure. Problems must be addressed with friends; admitting the existence of a problem is not admitting failure. The source of stressors must be removed whenever possible, and then attention may be turned to treating the individual. Adverse habits have to be controlled, and increased sleep and recreational opportunities taken. Work should also be realistically assessed and arranged to allow for flexibility and reasonable completion. Additional training may be necessary to allow for all of this. Social support, an essential component of survival, should be sought and provided.

Education of squadron members in all aspects of stress is another "must" for flight surgeons, psychologists and supervisors alike. Formal stress management, to include self-awareness programs, follows under the guidance of health services professionals.

Stress is very real. It is essential to life, but equally it can destroy life. An increased awareness by all concerned of the effects of ever-present stress on aircrew, and how to manage resulting problems, is essential if flight safety is to be maintained. Ignoring a failing aviator is fair to no one, as treatment to fully restore the flier is both available and effective.





Outstanding Individual Safety Achievement Award



Sgt Richard C. Beiter
49 CRS, 49 TFW
Holloman AFB NM

Is awarded to Sergeant Richard C. Beiter, 49th Consolidated Repair Squadron, 49th Tactical Fighter Wing, Holloman AFB NM. His immediate reactions to emergencies and his complete comprehension of technical data prevented two separate potentially catastrophic aircraft/engine mishaps within a two-day period. While operating aircraft 77-0111 in the hush house for a reported double augmentor blowout, the right Aircraft Mounted Accessory Drive (AMAD) failed internally and caught fire causing a portion of the aircraft to be engulfed in flames. At the first indication of smoke, Sgt Beiter retarded the throttles when the AMAD fire light illuminated, then discharged the aircraft mounted extinguisher prior to performing emergency engine shutdown procedures. His flawless actions in response to this emergency contained the AMAD fire and prevented

damage to the aircraft and engine. The aircraft was returned to fully mission capable status within 24 hours. On the following day, an uninstalled engine was operating at military power when a stall/stagnation occurred, creating an internal engine bore fire. Sgt Beiter was performing the engine trim

recorder duties and observed the increasing internal engine temperature as the engine was shut down. Emergency procedures were performed by motoring the engine to reduce the temperature and extinguish the fire. After two attempts to extinguish the fire, the engine seized but continued to burn internally. Sgt Beiter immediately exited the control cab and assisted in discharging a 150 gallon bottle of halon into the engine intake, which had little effect on the increasing temperature. Sgt Beiter attained another 150 gallon bottle of halon and discharged it down the engine exhaust successfully extinguishing the fire. Sgt Beiter's quick actions and thorough knowledge of tech data prevented personnel injury and damage to equipment.

Sgt Beiter's expertise and attention to detail have earned him the TAC Outstanding Individual Safety Achievement Award.

A "10" ... ON THE WRONG INDEX

DOWN TO EARTH



ITEMS THAT CAN AFFECT YOU AND YOUR FAMILY HERE ON THE GROUND

Master Sergeant Lewis E. Newman
347 CS/SE
Moody AFB GA

The "101 Critical Days of Summer" program provides excellent information which most of us use to benefit from the experience of others. Some people, however, never learn. The following story dramatically shows how people can hear, but not listen. The outing was planned to be a fun time; but, a disregard for sensible—reasonable—safe behavior, led to a fairly predictable outcome. In fact, the surprise would have been if nothing adverse had happened.

While on a camping trip, a group of six people were driving down a service road to visit some ancient Indian paintings. The vehicle was so small that three passengers decided to ride on the outside: one on the hood and two (one on



each side) on the roof. The setting was summertime, temperature over 100 degrees and plenty of beer.

The passengers inside passed beer to the roof riders. The driver was only doing 20 mph because of the large rocks and potholes in the road. The roof riders picked up a traffic cone and passed it around as a dunce cap. The roof passenger on the right was holding the cone between his calves with his feet on the windowsill of the passenger door, while he dipped into his stash of snuff.

As he was squirming around, the cone, jutting into the passenger compartment, hit the inside passenger in the shoulder. Just picture it: the

car bouncing over rocks and dodging potholes; a drinking roof rider trying to hold a traffic cone between his knees; digging for his can of dip; and then the inside passenger pushes the cone away. Away went both the cone **and** the roof rider. He slid off the truck, hit the ground, and bounced several times; ending up face down in a ditch.

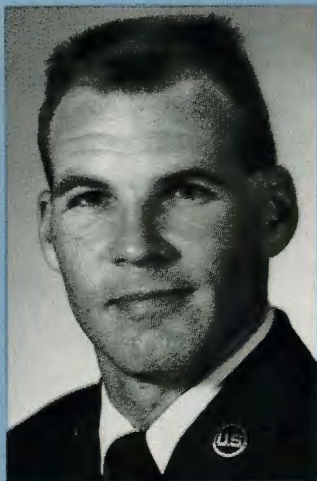
So what was the cost of this bit of summer fun? More than anyone should pay. A permanent total disability. Please listen and learn. We all need to score points, but not on the wrong index.

Outstanding Individual Safety Achievement Award

On 13 Jul 91, Staff Sergeant Larry J. Nunn, aircraft operator, Staff Sergeant Michael R. Ring, control room monitor, Sergeant Sherri A. Northington and Sergeant Dean A. Ellison, aircraft ground observation crew, were troubleshooting an F-15 in the hush house for an afterburner blowout. After stabilizing at idle for ten minutes and successfully completing the dynamics test, Sgt Nunn continued the test with a rapid throttle movement to military power. After approximately three seconds at military power, the engine speed and temperature started fluctuating, alerting him to return the throttle to idle.

During throttle transition from military to idle, the engine stagnated with ferocity. Thinking quickly, Sgt Nunn chopped the throttle, armed the fire system and started the jet fuel starter in preparation to motor the engine for cool down. It was at this point that he observed Sgts Northington and Ellison running toward the left engine, fire hose in hand. Sgt Ring remained at the fire suppression panel in the control room communicating that smoke was rolling out from under the engine. Despite the absence of fire, Sgt Northington and Sgt Ellison assessed the potentially dangerous situation and discovered an exploded

gear box. With this added knowledge, they knew that motoring the engine to cool it could destroy the engine and severely damage the aircraft. They quickly signaled Sgt Nunn to shut everything down and evacuate the aircraft. Sgts Nunn, Ring, Northington and Ellison displayed superior knowledge and execution of emergency procedures under extremely challenging conditions. Their exceptional performance precluded possible injury to personnel, averted collateral damage to nearby facilities, saved a valuable combat asset, and earned them the TAC Outstanding Individual Safety Achievement Award.



SSgt Larry J. Nunn



SSgt Michael R. Ring



Sgt Sherri A. Northington



Sgt Dean A. Ellison

405 CRS, 405 TTW
Luke AFB AZ



TAC TALLY

CLASS A MISHAPS
AIRCREW FATALITIES
* IN THE ENVELOPE EJECTIONS
* OUT OF ENVELOPE EJECTIONS

* (SUCCESSFUL/UNSUCCESSFUL)

TOTAL			TAC			ANG			AFR		
SEP	THRU SEP		SEP	THRU SEP		SEP	THRU SEP		SEP	THRU SEP	
	FY91	FY90		FY91	FY90		FY91	FY90		FY91	FY90
2	25	29	2	13	20	0	12	6	0	0	3
2	9	18	2	5	10	0	4	6	0	0	2
2/0	21/1	23/0	2/0	10/0	15/0	0/0	11/1	6/0	0/0	0/0	2/0
0/0	0/2	1/1	0/0	0/0	1/1	0/0	0/2	0/0	0/0	0/0	0/0

CLASS A MISHAP COMPARISON RATE

(CUMULATIVE RATE BASED ON ACCIDENTS PER 100,000 HOURS FLYING)

TAC	FY 91	0.0	0.0	0.7	1.8	2.2	2.2	2.2	1.9	1.7	1.8	1.8	2.0
	FY 90	1.8	2.8	2.7	3.0	2.4	2.7	2.8	2.9	2.8	2.7	2.8	3.2
ANG	FY 91	3.8	2.0	1.3	3.9	3.2	4.0	5.2	5.0	4.9	4.8	4.3	4.3
	FY 90	0.0	0.0	1.6	1.2	0.9	0.8	1.3	2.2	2.4	2.2	2.0	2.2
AFR	FY 91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	FY 90	20.4	11.2	8.2	5.9	4.7	7.7	6.4	5.5	4.8	4.4	4.0	3.6
TOTAL	FY 91	1.2	0.6	0.8	2.3	2.4	2.6	2.9	2.7	2.5	2.5	2.4	2.5
	FY 90	2.4	2.5	2.7	2.6	2.1	2.4	2.6	2.9	2.8	2.7	2.6	3.0
MONTH	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	

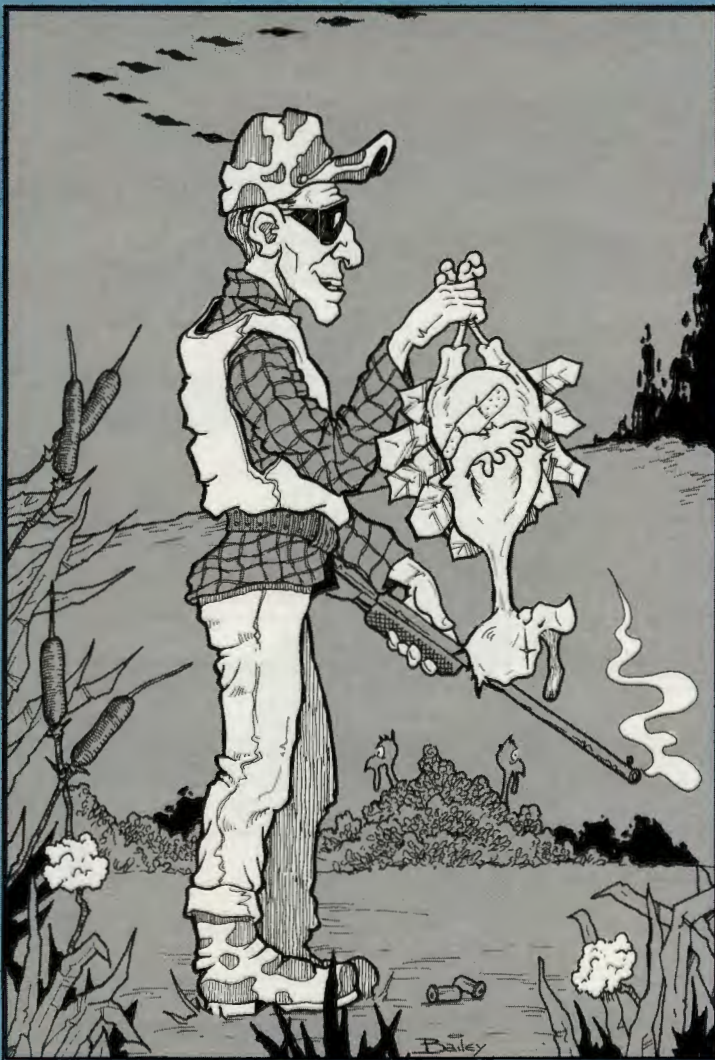
TAC'S TOP 5 thru SEPTEMBER 1991

1st AF		9th AF		12th AF	
"COMMAND-CONTROLLED CLASS A MISHAP-FREE MONTHS"					
143	48 FIS	51	1 TFW	53	479 TTW
68	57 FIS	30	56 TTW	45	355 TTW
28	325 TTW	22	31 TFW	44	366 TFW
		21	33 TFW	39	27 TFW
		15	354 TFW	25	49 TFW
ANG		AFRES		DRUs	
"COMMAND-CONTROLLED CLASS A MISHAP-FREE MONTHS"					
464	119 FIG	181	301 TFW	180	552 AWACW
440	147 FIG	125	482 TFW	71	28 AD
250	110 TASG	122	924 TFG	50	USAFTAWC
224	138 TFG	110	906 TFG	42	USAFTFWC
203	112 TFG	85	507 TFG		

SAFETY

**DON'T JUST THINK IT,
LIVE IT**

THIS...



NOT THIS...

