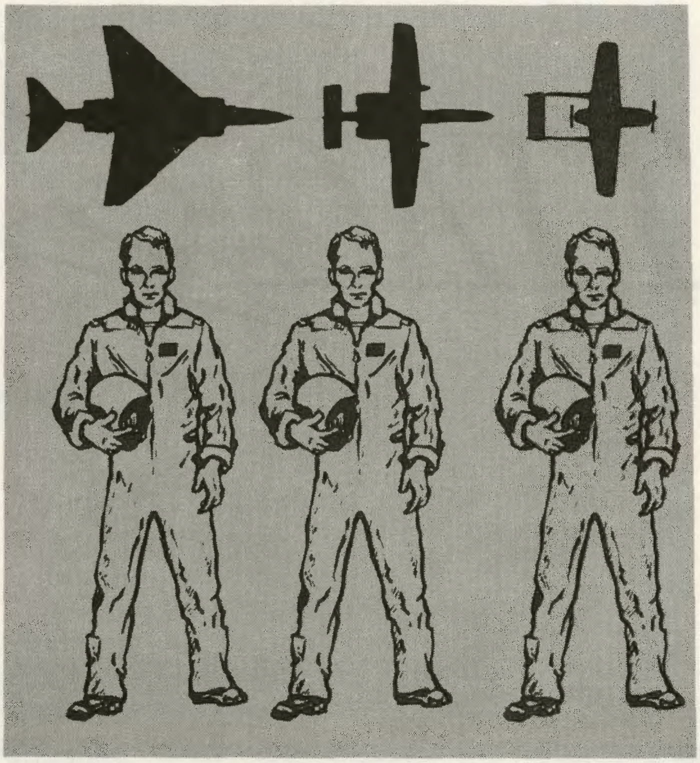
TAC ATTACK

AUGUST 1984



ANGLE OF ATTACK

The air and ground losses reflected in this issue of *TAC Attack* are intended to remind us that during the first half of 1984 we have lost more than cold statistics. We have lost dear friends and precious combat capability. While our record is about the same as last year at the midway point, operator factor is higher than last year. There is no time in our business to rest on laurels. Still, we are optimistic that the last half of the year will parallel the 1983 history.

One reason for our optimism is that we have begun to receive your reports on TAC Safety Day. The reports confirm one thing we already knew--you know how to make things better. We are reviewing each report in detail and will be sharing the lessons learned through command and safety channels.

While current leadership writings extol the virtues of one-minute management, quality circles, and other buzz words, we in TAC continue to rely on the value of *listening*. The basic organization of the command is the flight or section. Flight commanders and section leaders are in position to learn good ideas from their teammates. But that doesn't just happen. Each of us must be innovative in soliciting ideas on doing the mission smarter--therefore safer. Don't wait for the next safety day to listen.

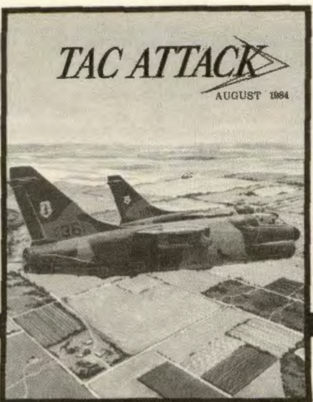
In hangar flying sessions, younger pilots wonder (but seldom ask) how bold pilots become old pilots. Maj John Gibbs (who really isn't *that* old) shares a dozen bullets of *back-to-basics* information that flight commanders and section leaders throughout TAC should use as a starter to answer the question.

Also in this issue, Lt Col Tim Kinnan takes a detailed look at what happens inside the engine during compressor stalls. Nearly all jets are susceptible when we fly in the top left side of the flight envelope. Capt Larry Danner explains that the reason your F-16 doesn't always rotate when you expect it can be right in front of your eyes. And MSgt David MacDonald provides his own "bullets" for towing an aircraft from here to yon in one piece.

Let's capitalize on the lessons of safety day, listen to the troops, and work smarter. Time invested in building the team and drilling on the basics will be returned in performance.

Harold E. Watson

Harold E. Watson, Colonel USAF
Chief of Safety



ON THE COVER:
A-7D Corsair II s
over the midwest.

AUGUST 1984

DEPARTMENT OF THE AIR FORCE

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

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

Distribution F(X) is controlled by TAC/SEP through the PDO, based on a ratio of 1 copy per 10 persons assigned. DOD units other than USAF have no fixed ratio; requests will be considered individually.

Subscriptions for readers outside of DOD are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. All correspondence on subscription service should be directed to the superintendent, not to TAC/SEP.

TAC ATTACK (ISSN 0494-3880) is published monthly by HQ TAC/SEP, Langley AFB, VA.
POSTMASTER: Send address changes to *TAC ATTACK*, TAC/SEP, Langley AFB, VA 23665.
Second-class postage paid at Hampton, Virginia, and additional mailing offices.

It won't rotate— I'm aborting

By Capt Larry Danner
4th TFS/SEF
Hill AFB, Utah

We have recently seen a rash of aborted takeoffs in the F-16 community for *no rotation.* A striking example is the pilot who aborts at 160 knots—when the rotation speed for his 2-bag, block 10 Falcon is 161 knots.

The first obvious impact of an abort for no rotation is a lost sortie. However, the more important consideration is the effect on the aircraft itself: hot brakes, brakes in the caution or danger zone, and potential aircraft damage (see the article "F-16 Brakes: A Fiery Issue" in the December 1983 issue of *TAC ATTACK).* In most *no rotation* cases, the aircraft was responding properly and the lack of rotation was the result of *pilot technique, strut servicing,* or a combination of the two. Although lack of flight control response cannot be discounted, it should be evident when you check flight control response prior to takeoff.

Rotation speed obtained from the Dash One performance charts is based on two assumptions (unfortunately, the Dash One does not tell us what these assumptions are). First, rotation speed charts assume exact strut servicing. Second, they assume that the pilot is applying FULL aft stick pressure. Any deviations from these conditions will directly affect the speed at which the aircraft rotates.

First, let us look at strut servicing. When the struts are serviced, the crew chief starts by letting out all the gaseous nitrogen pressure and then ensuring the hydraulic fluid level is correct. Next, he attaches a nitrogen bottle to the strut through a pressure gauge and valve assembly. Our intrepid maintainer then adds compressed nitrogen gas from the bottle to the strut and refers to a chart that lists pressure ranges and an "X-dimension" or strut extension value for each pressure range. The strut pressure is varied until the X-dimension matches its corresponding pressure range.

When all three struts are properly serviced, the angle between the floor of the cockpit and the horizontal plane of the earth (the deck angle) will be a given value. Misserviced struts change the deck angle. Two other relationships can be determined from deck angle: the wing angle of attack and the longitudinal distance between the center of gravity (CG) and the main gear axle (Figure 1).

If the deck angle changes because of an underserviced nose strut, for example, the longitudinal distance from the CG to the main gear axle changes; in this case (Figure 2) it increases to d. It is now apparent that the force required to lift the nose is increased in direct proportion to the change in d. Put another way, the weight held up by the nose strut (Wn) increases and the weight held up by the main struts (Wm) decreases.

Now, let's look at what happens when we roll down the runway with our underserviced nose strut (Figure 3). The first effect will be less lift developed by the wing (Lw) because the nose is lower and thus the initial angle of attack is lower than it would be on the same aircraft with correctly serviced struts. Consequently, the natural tendency of Lw to raise the nose is reduced. As Lw (which is forward of the CG) increases, the weight supported by both the nose strut (Wn) and main gear struts (Wm) is reduced, but Wn is reduced faster than Wm. If the forward velocity is increased enough, the aircraft will tend to rotate and fly without any input from the pilot; however, to keep the takeoff roll within reasonable tire speed and runway length limits, we require the pilot to make flight control inputs.

Thus, the pilot enters the picture. The pilot's input is aft stick pressure which drives the trailing edge of the horizontal tails up and, therefore, creates a downward lift component (Lht). This downward lift vector, well aft of the CG, forces the tail down and the nose up. If the pilot does not apply full back pressure (the performance chart assumption for computing rotation speed), the Lht will be less and therefore, not lift the nose until increased airspeed makes up for the reduced pitch input. The aircraft will eventually become airborne; it is simply a matter of gaining enough speed to raise the nose.

In our attempts to make the rotation and takeoff occur at the computed numbers, we must ensure the servicing is correct and then input full aft stick. If this is not done, the aircraft cannot rotate at the computed speed.

Figure 1

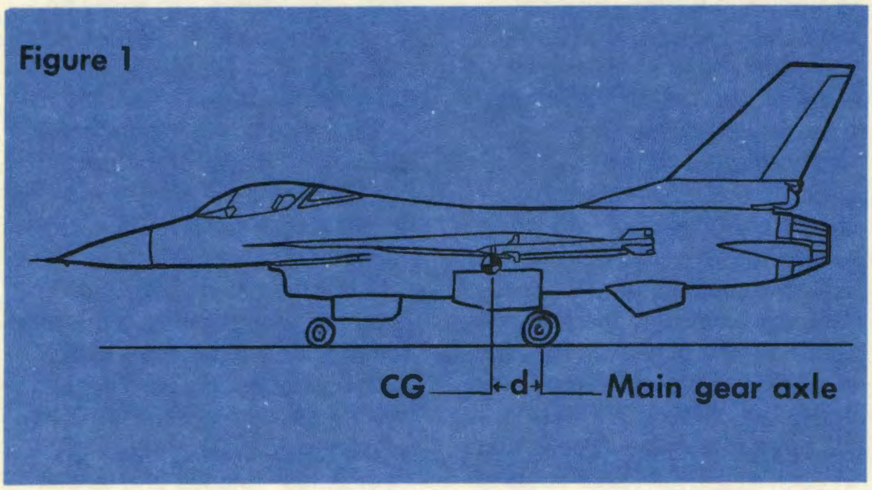


Figure 2

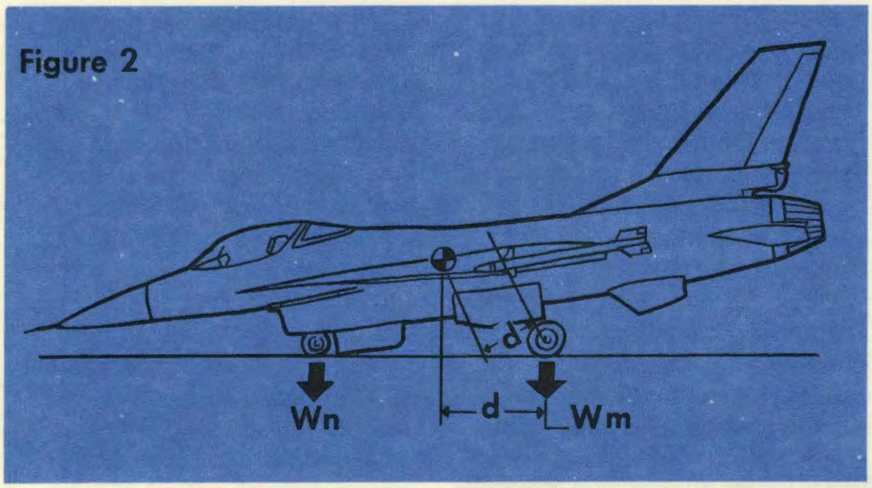
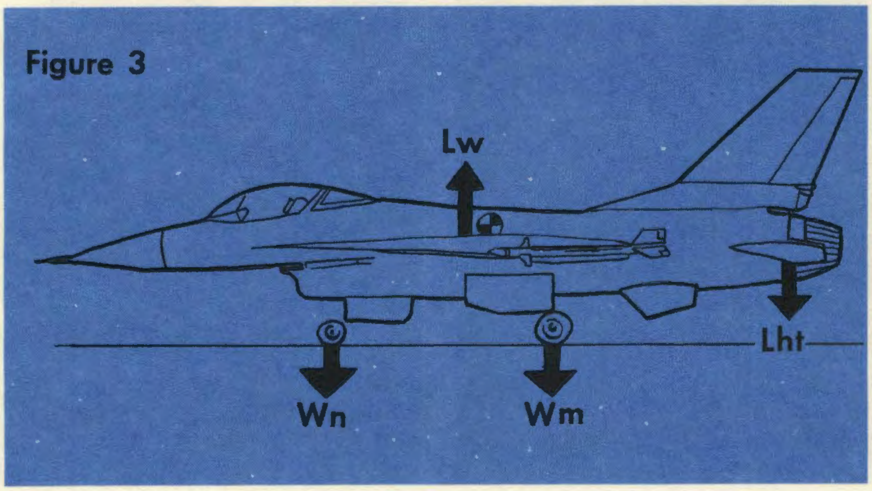


Figure 3



It won't rotate—I'm aborting

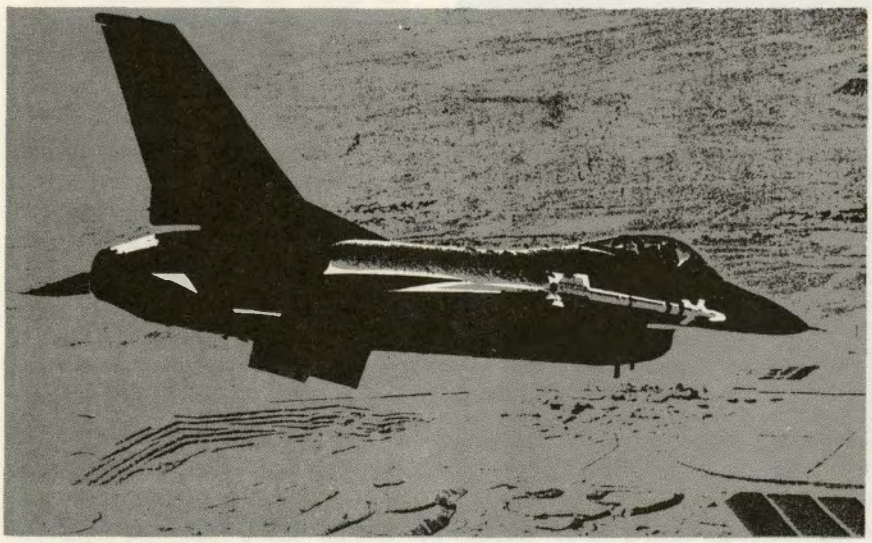
"But how do we check the servicing," you ask? Other than putting a pressure gauge on each strut and comparing the pressure to the X-dimension, there is no book answer. Here is a rule of thumb that works for me: depending on what kind of a load the aircraft is dragging around, if the pitot tube is somewhere between the top of my head and my throat, then everything is OK. But if the pitot tube is down by my navel, something is not right. And if I have to stretch to get the pitot cover off, it is also time to start asking questions. Oh yes, I'm 5 foot 8. Another thing I've noticed: if one wing tip is at eye level and the other is the height of a chin-up bar, maintenance usually finds one main strut flat. So, since you probably don't carry your own pressure gauge to check actual strut servicing, you can develop a "feel" for what looks about right, and at least feel comfortable about everything being close. Another indicator of a misserviced nose strut is "bottoming out" during the BUC check, the 80 percent run-up check, or during taxi—too much air and too little fluid is most likely the problem here.

Now a word from the folks that figure out the dynamics involved in rotating the jet for takeoff. The engineers at General Dynamics tell me that a one-degree change in deck angle will result in about seven knots change in rotation speed. What is one degree relative, for example, to nose strut extension? My slide rule says it is about a 2¾-inch change in nose strut extension. That works out to about six inches at the pitot tube. But the nose can change that much by putting a load of MK-82s on the aircraft. So, as I said before, you can only get a feeling of "reasonable" based on the aircraft's ground attitude.

The method used to compute rotation speed is critical if you use that speed as an abort criteria. If you race through the chart two minutes prior to brief and do not take CG into account, then your figures can easily be five to ten knots off. "Where does one find CG," you ask? Talk to your friendly Quality Assurance folks; they have computed the CGs for all loads for the most forward and most aft CG aircraft in the wing. Wing Stan/Eval also has the information; they tell you where it's located in volume V of the FCIF. Some shops gather this information into an easy-to-use chart showing configuration and worst case (most forward) CG which you can use to get "corrected" rotation and takeoff speeds.

Although you are now armed with all the information you need to rotate at the precise book airspeed, expect to find actual rotation speed plus-or-minus five knots and possibly more because of strut servicing and other variables that are beyond your control.

What the experts say is, "Give the jet a chance." Do a good check of flight control movement at EOR; make sure you've applied full aft stick by the time you're at the computed rotation speed; then be patient. Don't expect that "on speed" takeoff everytime. ➤



Captain Danner graduated from Northrop Institute of Technology in 1972 with a BS in Aerospace Engineering. He was commissioned through ROTC then went to UPT at Craig AFB, Alabama. From there he went to F-4 RTU at Luke AFB, Arizona. He was an F-4 pilot at Bitburg, Germany, and Osan AB, Korea. He spent two years as an O-2 FAC at Bergstrom AFB, Texas, and has been flying F-16s at Hill AFB, Utah, since Jun 80. He's also been additional duty safety officer since Sep 82.

AIRCREW OF DISTINCTION

1st Lt Joseph M. Ford
Capt Ronald A. Rubenbauer
68 TFS, 347 TFW
Moody AFB, GA

On 26 February 1984, 1st Lt Joseph M. Ford and Capt Ronald A. Rubenbauer were number two on a 2-v-2 air intercept mission. Passing 14,000 feet MSL on departure, their F-4E began to yaw severely left and right. Lieutenant Ford immediately squeezed the emergency quick-release lever (paddle switch) on the control stick in case the stability augmentation system had malfunctioned. But the paddle switches in both cockpits were useless.

Lieutenant Ford informed his flight leader of the problem, and the flight began to turn to RTB. During the right turn, the aircraft rolled violently to the left. Lieutenant Ford was able to stop the roll with full aileron and rudder. Then the aircraft began banking 30 to 70 degrees alternately left and right. The flight lead reported that the rudder was continuously moving 5-10 degrees either side of center.

While dumping fuel, Lieutenant Ford and Captain Rubenbauer reviewed the emergency procedures for several flight control malfunctions that might be causing the problem. They tried using rudder trim, turning off stab augs, and pulling the ARI and rudder trim circuit breakers. But none of these actions improved or corrected the situation. The crew discussed their dilemma with the supervisor of flying who phoned the F-4 air logistics center (ALC) for help. A technical representative at the ALC suggested turning off the generators. But that didn't work either.

Lieutenant Ford and Captain Rubenbauer rejected bailout, because their aircraft was not uncontrollable. At 15,000 feet MSL, they slowed the aircraft to see if it was flyable when configured. When the gear and flaps came down, the Phantom rolled into a right bank which the pilot was unable to counter until he raised them again.

The crew tried a second controllability check (this time with flaps up) at 12,000 feet MSL, 35 miles out on final. When Lieutenant Ford lowered the gear handle, the gear did not extend. So he blew down the gear. Configured, the aircraft was stable in pitch, and the pilot was able to successfully counter yaw and roll inputs. The crew felt they could continue to a safe landing.

Lieutenant Ford flew final at 230 knots. Eight miles from touchdown, the aircraft rolled into a right 45-degree bank turn that he could not override until the Phantom had turned 180 degrees. Then, Lieutenant Ford continued the turn and rolled out heading for the runway. Touchdown occurred at 220 knots in a left bank. The aircraft engaged the departure-end cable and stopped on the runway.

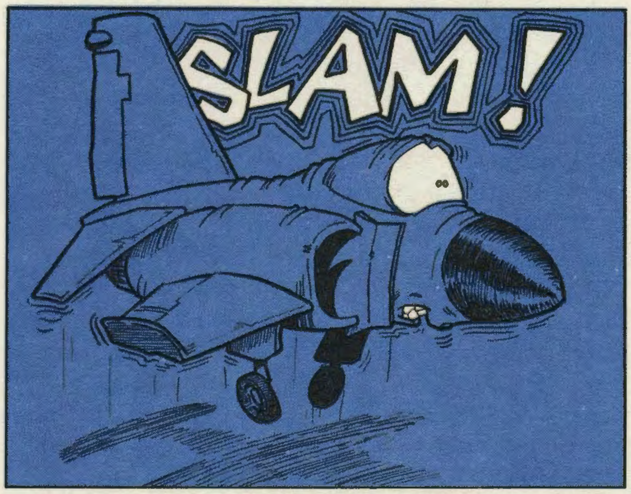
The outstanding airmanship and professional skill of Lieutenant Ford and Captain Rubenbauer saved a valuable aircraft and earned them the Tactical Air Command Aircrew of Distinction Award.

CHOCK TALK

INCIDENTS AND

A closer eye

As the F-4 returned to its parking spot, the crew chief and his new assistant were standing by to park and chock the aircraft. Once that was done, the inexperienced chief got a little ahead of his checklist. He tried to install a safety lock onto the aux air door actuator before the pilot shut down the engines. He just about had the lock in place when the generator dropped off the line in the shut down sequence. The power interruption caused the door to slam violently. When it did, the partially installed



safety lock damaged the door. It bent it up so badly that it couldn't be repaired locally. Imagine what it could have done to the chief's arm. He was lucky. Even safety equipment that's designed to prevent injuries can bite if it's used improperly.

The Phantom has been around a long time. And its aux air door bite is about as well known as that gator who took off Captain Hook's hand. Despite the door's reputation and without close supervision, this fairly new guy (FNG) was almost seriously injured.

Does your aircraft bite? Does it have special hazards that you've learned to watch out for or work around? Well, they may be second nature to you now—but the FNG in your outfit will try to learn them the hard way unless you help point them out. Keep a close eye on him while he's learning. It could save you both a lot of grief.

Skipped step

A worker was performing maintenance on the armament control panel of an A-10. To get at the works behind the panel and to have more room to maneuver his tools, he raised the landing gear handle. When the job was complete, he signed off the aircraft forms and headed for another job.

A while later, a pilot came out to fly the aircraft. When he started the first engine, hydraulic fluid found its way to the nose gear actuator, and the nose gear retracted. Kabam! The Warthog's snout slammed to the concrete ramp. The actuator was only doing what the raised gear handle was telling it.

In the A-10, a solenoid operated mechanism locks the handle in the down position. Normally the handle can't be raised until weight is off the gear. But a manual override feature allows maintenance workers to move the handle while the aircraft is on the ground.

The maintenance TO for the job that the worker was doing has two separate warnings at crucial steps in the procedure to insure the worker returns the landing gear handle to the down and locked position. And confirming the handle is down before engine start is one of the pilot's cockpit checks as well. But they each missed the step in their tech data. And the Warthog took it on the nose. Another case of "failure to follow tech data." It happens too often.

INCIDENTALS WITH A MAINTENANCE SLANT

Dear transient alert

Hi. I'm the highlighted pin you see in the drawing over there. My Air Force name is "rocket motor initiator hose safety pin," but you can call me Rocky. I'm one of hundreds of parts that fit together to make up the Martin-Baker ejection seat in the F-4. *And I need your help.*

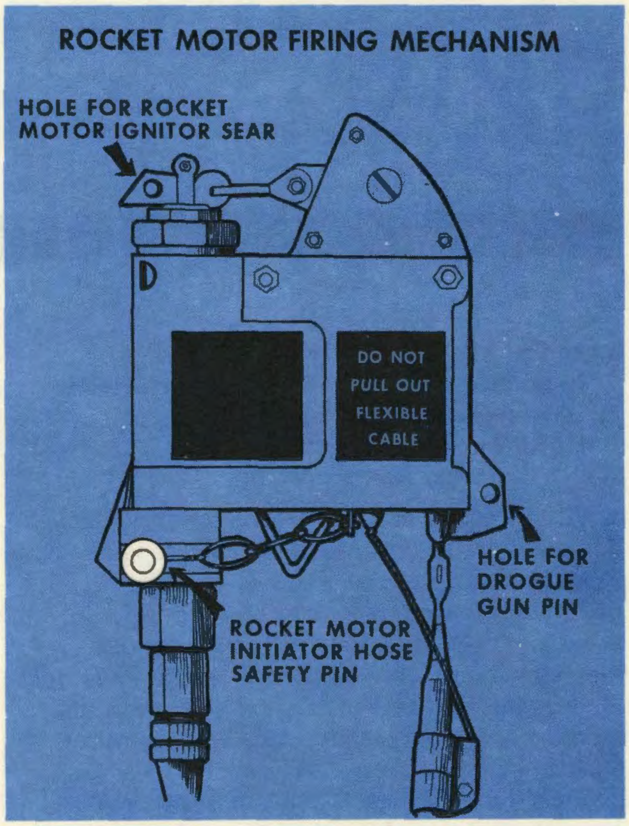
I was recently placed here on the side of the seat by TCTO 1F-4-1299. The rocket motor firing mechanism that I was added to used to be under the seat. But some folks thought it was a safety hazard there; so they moved us up where they could keep an eye on us. Here's my problem: a number of transient alert workers aren't familiar with my being up here yet. And one of the pins that safes the seat (the drogue gun pin) looks a lot like me. In fact, we look so much alike that occasionally I get pulled out too. Please don't ever do that—it destroys the seat's zero-zero capability.

I know, I know, they should have made me more distinguished looking than the other pin. But they didn't. So here's a couple of ways to remember me:

1) I'm about 4½ inches below the safety pin that fits into the rocket motor ignitor sear. And I'm about 4 inches left of the drogue gun safety pin.

2) Here's the big clue! I have a 3½ inch chain that attaches me to the seat. The other pins are on streamers and go into the pin bag.

Now that you know me, please LEAVE ME ALONE!



THE FIGHTER PILOTS' GUIDE TO COMPRESSOR STALLS

By Lt Col Timothy A. Kinnan
In collaboration with Dr. William H. Heiser
Distinguished Visiting Professor,
USAF Academy

Every fighter pilot has stories to tell about compressor stalls, surges, and related engine misadventures. But how many of us really understand these phenomena?

It's a widespread problem. There were 599 reportable compressor stalls last year in TAC. But this number is understated since most stalls are reported only if they lead to overtemp, flameout, intentional shutdown, or damage.

And it's a complicated problem. Each new generation of aircraft engines has included efforts to design out compressor stalls. We thought we had done pretty well with the J-79—until we put leading edge slats on the F-4E. A by-product of flying the Phantom at higher angles of attack is increased stalls. Despite our best efforts, the compressor stall remains a fact of life in modern fighters. Since the F-15 and F-16 have entered the force, we've added terms like stagnation and nonrecoverable stall to our vocabulary.

My purpose in this article is to explain in layman's terms how compressor stalls occur.

Very basically, a compressor can be thought of as a fan that pulls air through the tube. If the tube behind the fan is constricted, the air becomes compressed (Figure1). If we install a valve to adjust

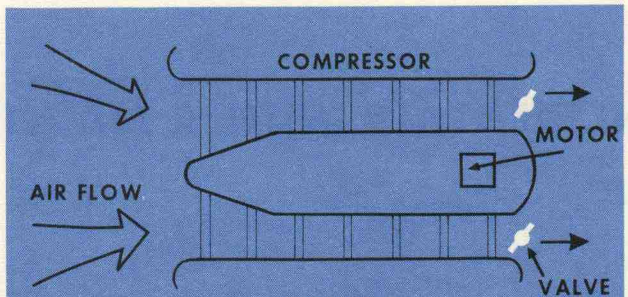


FIGURE 1

the size of opening behind the fan, we can vary the amount of compression. By reducing the size of the valve opening, air flow through the tube will decrease and the amount of compression will increase.

In Figure 2, compression (pressure rise) is on the

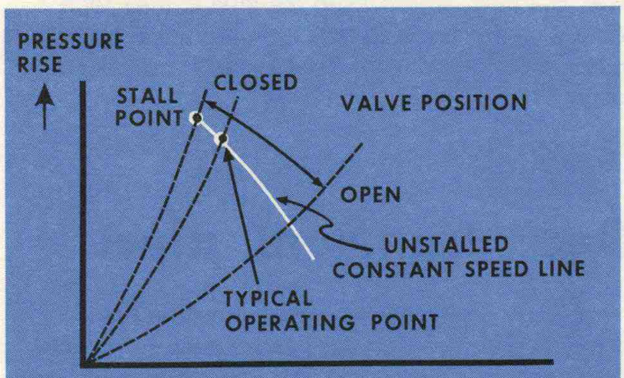


FIGURE 2

vertical axis, and amount of flow is on the horizontal axis. Because we hold rpm constant during this experiment, the solid line is called a constant speed line. As we open and close our valve, the compressor operating point moves back and forth along the line.

Since the compressor blades are airfoils creating lift, you can visualize their angle of attack increasing as the valve closes. Like all airfoils, they can reach a point where the flow separates from them and they stall (stall point in Figure 2). An important fact you won't read in your Dash One is that the compressor design point, for peak efficiency and high compression, is as close as reasonably possible to the stall point. This is significant, because it means the compressor doesn't have to deviate very far from normal flow before it stalls. When that occurs, the blades can no longer effectively pull the air through the tube; so the flow decreases drastically, and the compression drops. This is depicted in Figure 3

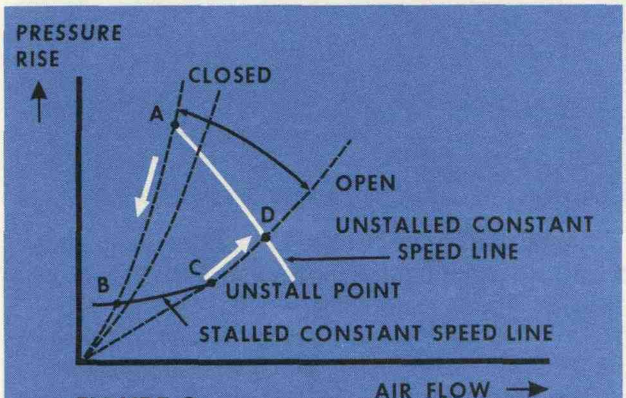


FIGURE 3

as a sudden departure from the *unstalled* constant speed line, a move from point a (stall point) to point b.

Intuitively, it would seem you could unstall the compressor by opening the valve a little bit, putting you back at point a, right? Wrong. Once the blades are stalled, the flow through the compressor is reduced to the point that the blades remain stalled. When the valve is opened, we now move up a *new* line, the *stalled* constant speed line, from point b towards point c. Once the compressor has moved onto the stalled constant speed line, it will stay there forever unless some action is taken, in this case opening valve sufficiently to get to the unstall point, c. At point c enough air is moving through the compressor that the blades' angle of attack is reduced below the stall point. When that happens, we jump back up to point d on the unstalled constant speed line. We say that the stall is now cleared.

It's worth noting that the blades don't stall uniformly. There will be patches of dead flow and patches of almost full flow. These patches would like to be stationary with respect to the compressor, but they can't decide whether to cling to the stationary vanes (stators) or turning blades (rotors). As a result, they split the difference and rotate at one half the rotor speed. Hence, the name "rotating stall" has become associated with the stalled constant speed line.

So much for theory. Now let's attach our compressor to a combustor, put a turbine behind the combustor (which we'll use to drive the compressor) and bolt it behind the inlet of a fighter. The valve behind the compressor in our theoretical engine has been replaced in the actual engine by turbine inlet guide vanes. The compressor operates in much the same manner as before, and either distorting the flow into the compressor or raising the pressure behind it will have the same effect (cause a stall) as closing the theoretical valve.

There are three general ways to distort the flow into or raise the pressure behind the compressor: compressor damage, engine malfunctions, and pilot inputs. Compressor damage, usually the result of FOD or birdstrikes, can distort the flow, and the inlet and engine controls have no way to compensate. Engine malfunctions can result from many things, such as material failure or improper engine rigging. The cause that you have the most control over is, of course, *pilot inputs.* If you make abrupt changes in angle of attack or sideslip angle, particularly in the upper left portion of the flight envelope, the inlet flow can be sufficiently distorted to cause a stall. If you combine that with throttle movements, particularly into and out of the afterburner range, you can send pressure pulses upstream through the turbine and backpressure the compressor.

Let's take a look at what happens in real life. You're flying an F-4, and you've just lured an aggressor into gun range. You're slow at 28,000 feet when you start a rolling break while lighting your afterburner. Pop! As our compressor stalls, the operating point starts down the line from point a to point b just as before. But real engines have an added complication: there's a big space right behind the compressor in the combustor. This space has the ability to store energy (or pressure) when the flow through the compressor suddenly drops, and then to release that energy (like a spring in a mechanical system). The result is shown in Figure 4. The operating point starts down toward b,

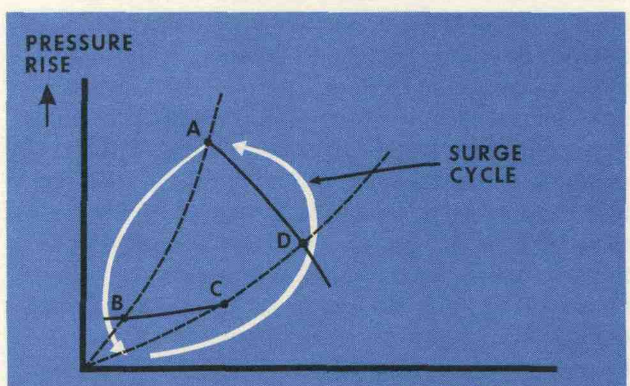


FIGURE 4

THE FIGHTER PILOTS' GUIDE TO COMPRESSOR STALLS

but as it arrives, the combustor releases its stored energy, and the compressor rebounds past points b, c, and d to return to point a. If the condition which caused the stall is still present, the compressor will stall again. This cycle repeats itself hundreds of times a second. During each cycle, the flow can actually reverse itself. The fuel/air mixture ignites in the combustor and actually goes backwards through the compressor and out the inlet. Any fighter pilot knows the result: loud noise (the hundreds of cycles actually sound like one loud thump or pop), spectacular flames out both ends of the airplane, and in airplanes like the F-100, where the pilot sits over the inlet, his feet get knocked off the rudder pedals.

Fortunately, the duration of the event is so short that it seldom results in damage. More importantly, it is so obvious that something is wrong that the corrective action is obvious—even instinctive. Once you've stopped doing whatever you were doing, the compressor's operating point usually returns to the unstalled speed line and you're back in business. This process is called "surge," and the loops around the chart in Figure 4 are called "surge cycles."

The previous discussion of the F-4 versus Aggressor engagement is not entirely pertinent to the F-15 and F-16. What's different in the F100 engine? Among the advances in the evolution of jet engines have been relatively smaller, lighter and more efficient combustors. The new combustors are less capable of storing enough energy to cause the compressor to go into a surge cycle. Other changes in the design of the compressor itself can also reduce the ability of the system to spring back towards point a. The result is that the compressor tends to spiral down to point b and damp out as shown in Figure 5. No bangs; no flames; just greatly diminished compressor performance. As I said before, the compressor is very happy to operate there forever until we take action to get it off the stalled constant speed line.

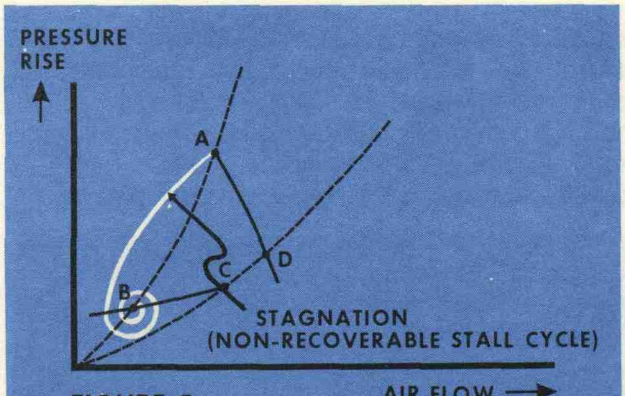


FIGURE 5

But we don't have a valve to open to get to point c as we did in the theoretical case. Rather, in most cases, we have to shut the engine down and start over. This is the type of stall that has emerged as our most serious problem, and it goes by many names: stagnation stall, nonrecoverable stall, and rotating stall. Whatever the name, the result is a loss of thrust, decaying rpm, little indication to the pilot, and possible engine damage from high temperatures.

Is there a moral to the story? You can certainly improve your odds by knowing your engine's operating restrictions, particularly for afterburner operation and by realizing that stalls are the result of the whole engine system working together. You are in charge of that system. Be aware of the problem; the sooner you recognize a stagnation stall, the more time (altitude) you have to work the problem, and the less chance of damaging the engine. Respect your engine and it will pay you back with reliable operation. Abuse it and lose it.

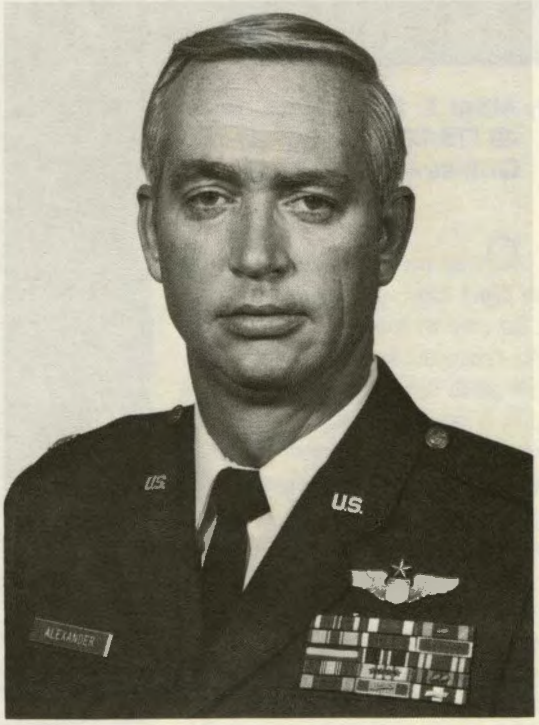
For those readers interested in a more rigorous and detailed discussion of compressor stalls, Dr. William H. Heiser will publish an article in *Aeronautics Digest* this September. This periodical is edited by the Department of Aeronautics at the U.S. Air Force Academy. To receive a copy, contact USAFA/DFAN, USAFA, Colorado, 80840, AUTOVON 259-4010.

Lt Col Kinnan graduated with a BS degree from the USAF Academy in 1970. He received his MS in astronautical and aeronautical engineering from Purdue University in 1971. He went to UPT at Columbus AFB, Mississippi. He has flown the F-4 at George AFB, California; RAF Woodbridge, UK; Clark AB, Philippines; and as a fighter weapons school instructor at Nellis AFB, Nevada. He completed a tour at Air Staff (Directorate of Programs), attended Armed Forces Staff College, and most recently worked for the command section at HQ TAC.

USAF SAFETY AWARDS

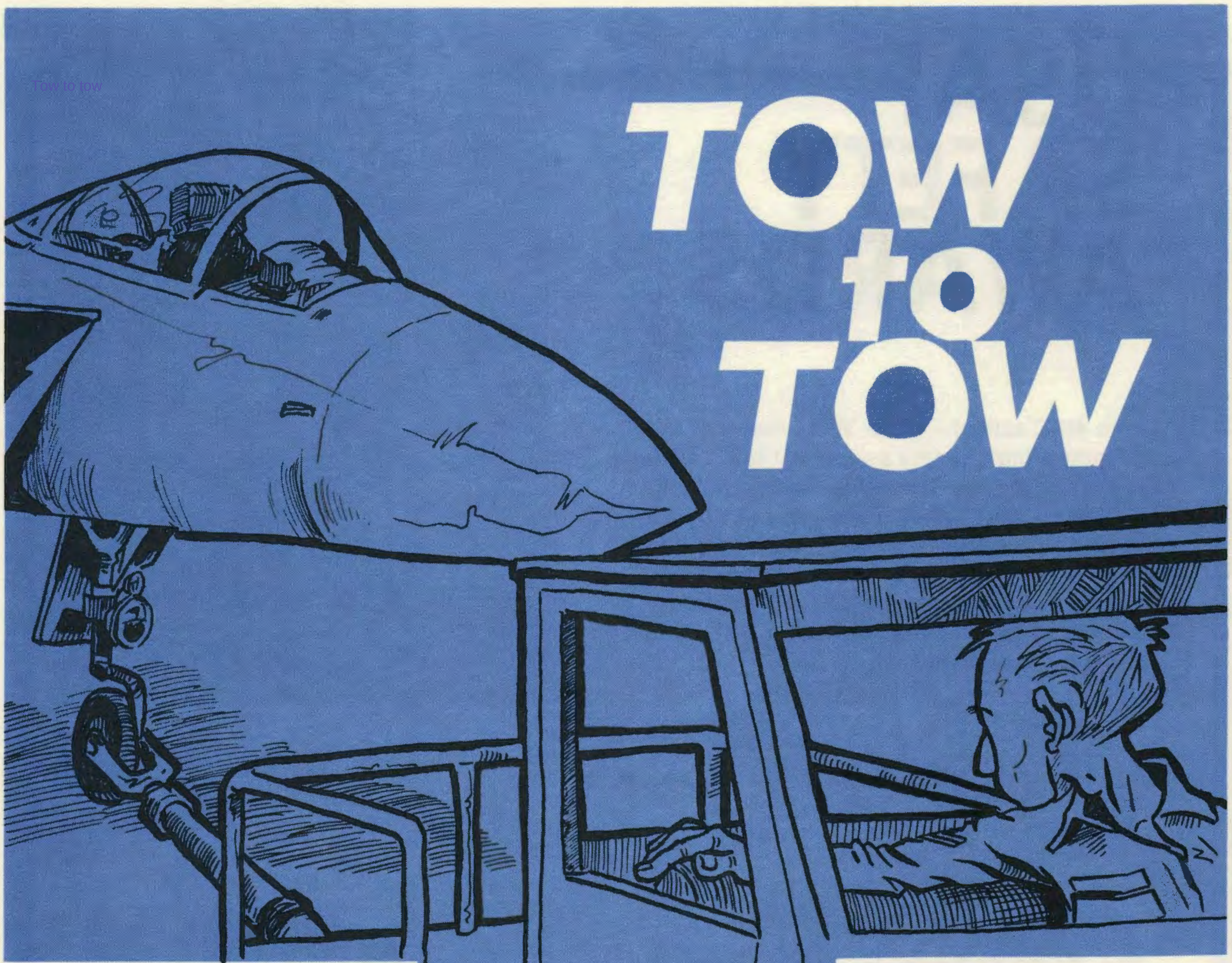
The 4th Tactical Fighter Wing made an outstanding flight safety sweep in 1983. The wing won the Colombian Trophy for flying more than 27,000 hours and 23,300 sorties in F-4 aircraft without a Class A or B mishap; the USAF Flight Safety Plaque for meritorious achievement in mishap prevention; and the TAC Flight Safety Award for flying one year without a command-controlled Class A mishap.

• • •



The Koren Kolligian, Jr., Trophy, which is awarded to the Air Force aircrew member who most successfully coped with an emergency in flight, also went to a member of the 4th Tactical Fighter Wing, Major Jon R. Alexander. Major Alexander was on a unit transatlantic deployment when he lost an engine on his F-4. With the help of his wingman and a KC-135 tanker, Major Alexander successfully flew 520 NM to the diversion base, Gander, Newfoundland, and landed safely despite an 800-foot ceiling and high surface winds. Major Alexander also won the USAF Well Done Award and the TAC Aircrew of Distinction Award for his superior flying skills in handling this serious inflight emergency.

TOW to TOW



By MSgt T. David MacDonald
49 FIS/MAAF
Griffiss AFB, New York

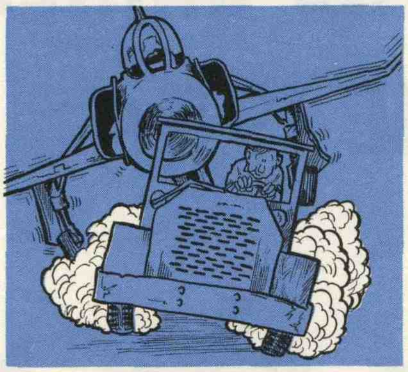
Of all the jobs required on the flight line, towing aircraft has to be one of the most common. The requirements are the same no matter where you go: start at point A and move to point B arriving with the aircraft intact. As a flight chief assigned to a fighter outfit, I am involved with a lot of towing. So when one of my crew chiefs is rated Unsat on a Quality Assurance evaluation because of a towing violation, I have to ask myself how this can happen.

From day one until retirement, crew chiefs are involved with towing. By regulation, a maintenance man cannot taxi an aircraft; so any time one has to be moved (and there are plenty of reasons), it's towed. And unless someone develops a better mousetrap, the tow vehicle and tow bar will be the equipment that's used.

So where is the problem? Why do we replace wingtips, stabilizers, rudders, and landing gear doors that were missing or damaged when we completed the task? Something happens between points A and B.

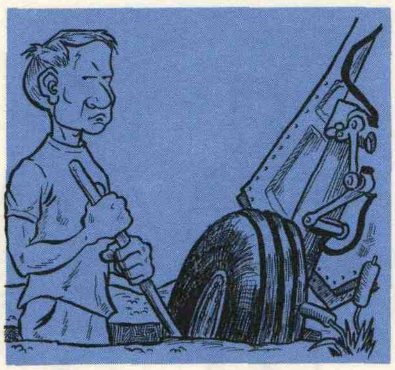
Let's examine a few misconceptions about towing aircraft, and see if they sound familiar:

• **The proper towing speed is 55 mph.** Have you ever been driving a pickup on the flight line and been passed by an aircraft that's being towed by a Coleman (MB-4) and tow bar? I have



received phone calls from my boss asking me if tail number 074 qualified for the Indy 500. Then he asks for my presence in his office. Believe me, flight chiefs don't need this.

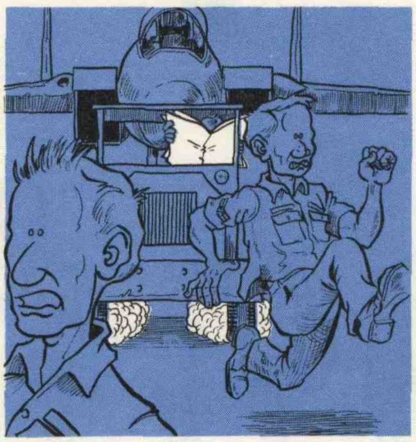
• **Yellow lines on the flight line and taxiways are just for pilots.** I have spent hours helping dig aircraft tires out of the mud because some yo-yo towed the aircraft 20 feet to the side of the center yellow line.



Please be assured, when a landing gear sinks in the dirt off the taxiway, you will receive swift attention and plenty of help pulling it out. Every agency that is even remotely related to aircraft maintenance will honor you with their presence. However, your flight chief won't be there; he or she will be explaining to the boss why, in the middle of a tow, one of his maintenance people changed his career field to civil engineering.

• **Checking the AFTO Form 373 (Operator's Inspection Guide) is only required when the tow vehicle runs out of gas or the transmission quits for no apparent reason.** Nothing turns my hair gray quicker than hearing someone say, "Just keep pumping the brake; it will eventually stop." And when the Coleman breaks down, there is the mad rush to sign off *all* the missing daily inspections—or worse, the driver will suddenly realize it's a different month than the one printed on the form.

• **Once the tow starts is a good time for the vehicle operator to take a break.** The break lasts until the aircraft reaches its destination, with or without him. Would you believe *some operators have been* known to smoke, drink, talk, and read while driving a vehicle



pulling a multimillion-dollar aircraft? Sure, we've read about them; and like the postman, they do it in the fog, rain, snow, and ice. Flight chiefs have been known to seek other employment when accidents occur under these circumstances.

• **The only qualification for tow team supervisors is being able to pick (within three guesses) the base that he or**

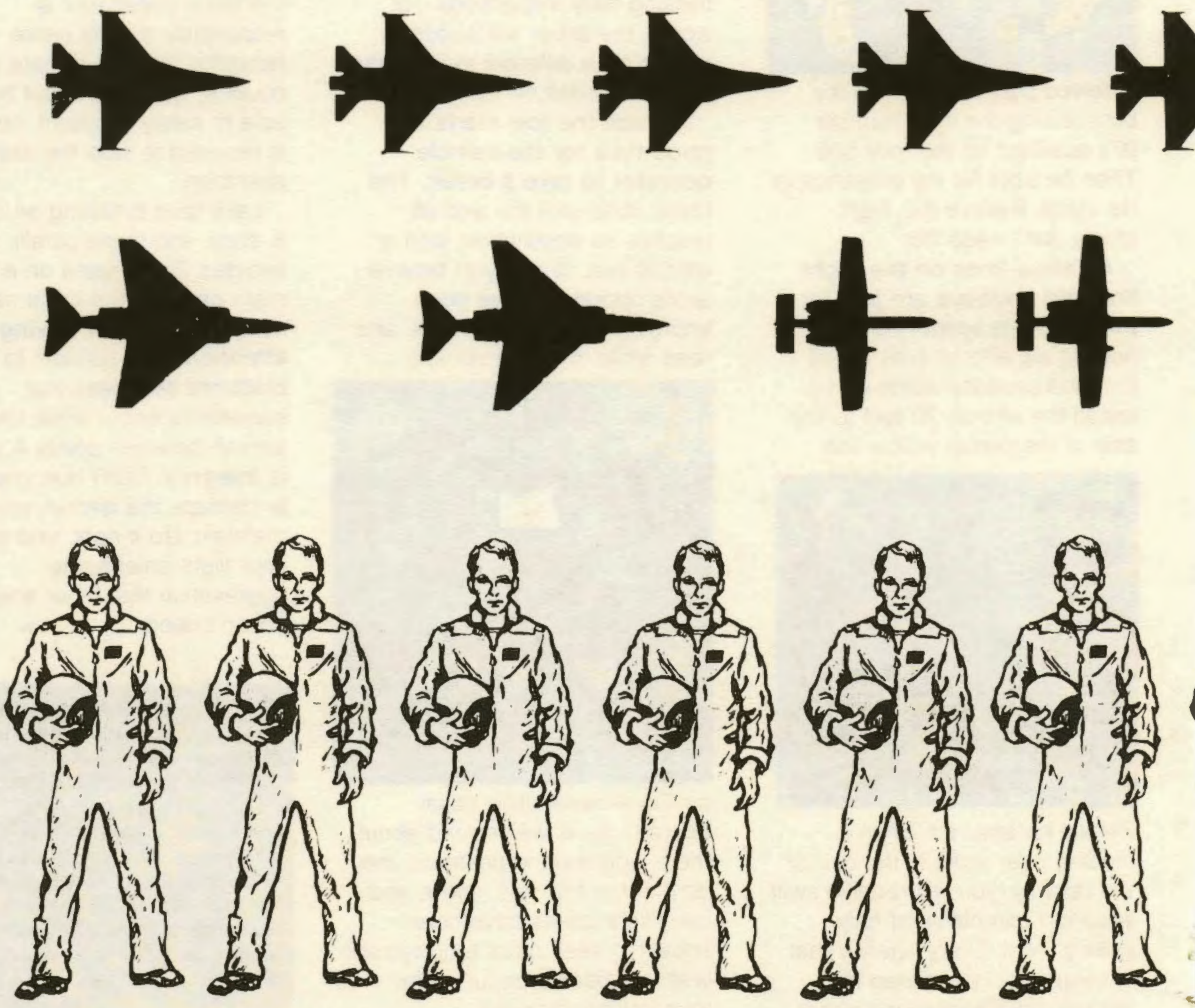
she is assigned to. In fact, the tow team supervisor is responsible for the entire operation. Period. If there is any doubt or question about being able to safely proceed, he or she is required to stop the towing operation.

Let's face it, towing an aircraft is easy, and these pitfalls can be avoided. But anyone on a tow *team can ruin the unit's safety* record just by ***not paying attention***. The solution to problems like these that sometimes occur while towing an aircraft between points A and B is ***integrity***. Don't hurt yourself or damage the aircraft you maintain. Do it right, and save your flight chief some aggravation that he or she doesn't need. ➤

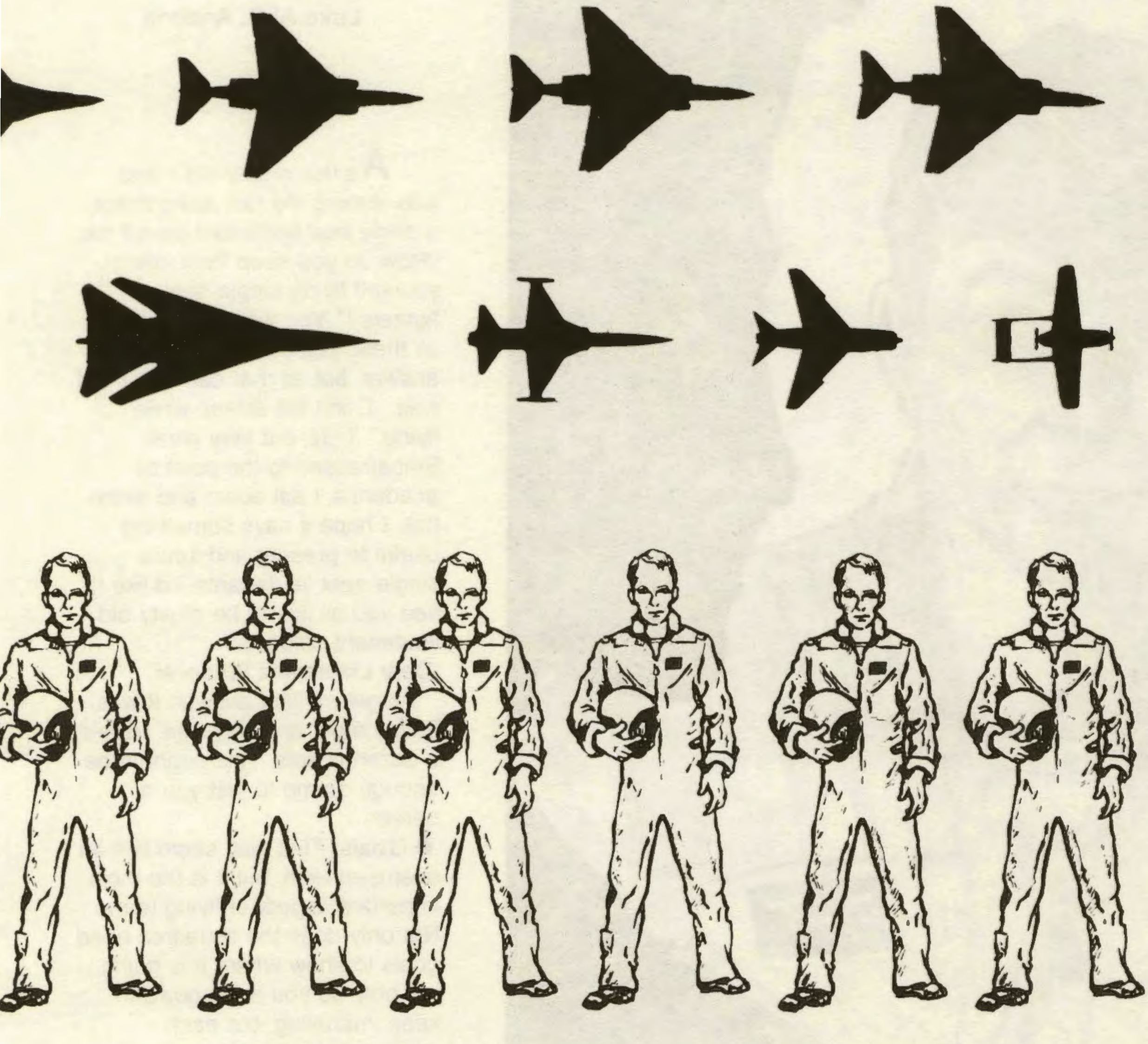
Sergeant MacDonald entered the Air Force in August 1969. Since then he's earned an AAS from the Community College of the Air Force and City College of Chicago. He has worked on and around aircraft most of his career, including assignments as the NCOIC of the repair and reclamation shop, 325 EMS, Tyndall AFB, Florida, and as the Flight Chief for 57 FIS, Keflavik, Iceland. Sergeant MacDonald is a graduate of NCO Leadership School, where he won the class speaker's award, and the NCO Academy where he won the Commandant's award. He's currently an interceptor flight superintendent with the 49 FIS, Griffiss AFB, New York.

OUR TAC AND TAC-GAINED

JANUARY-JUNE 1984

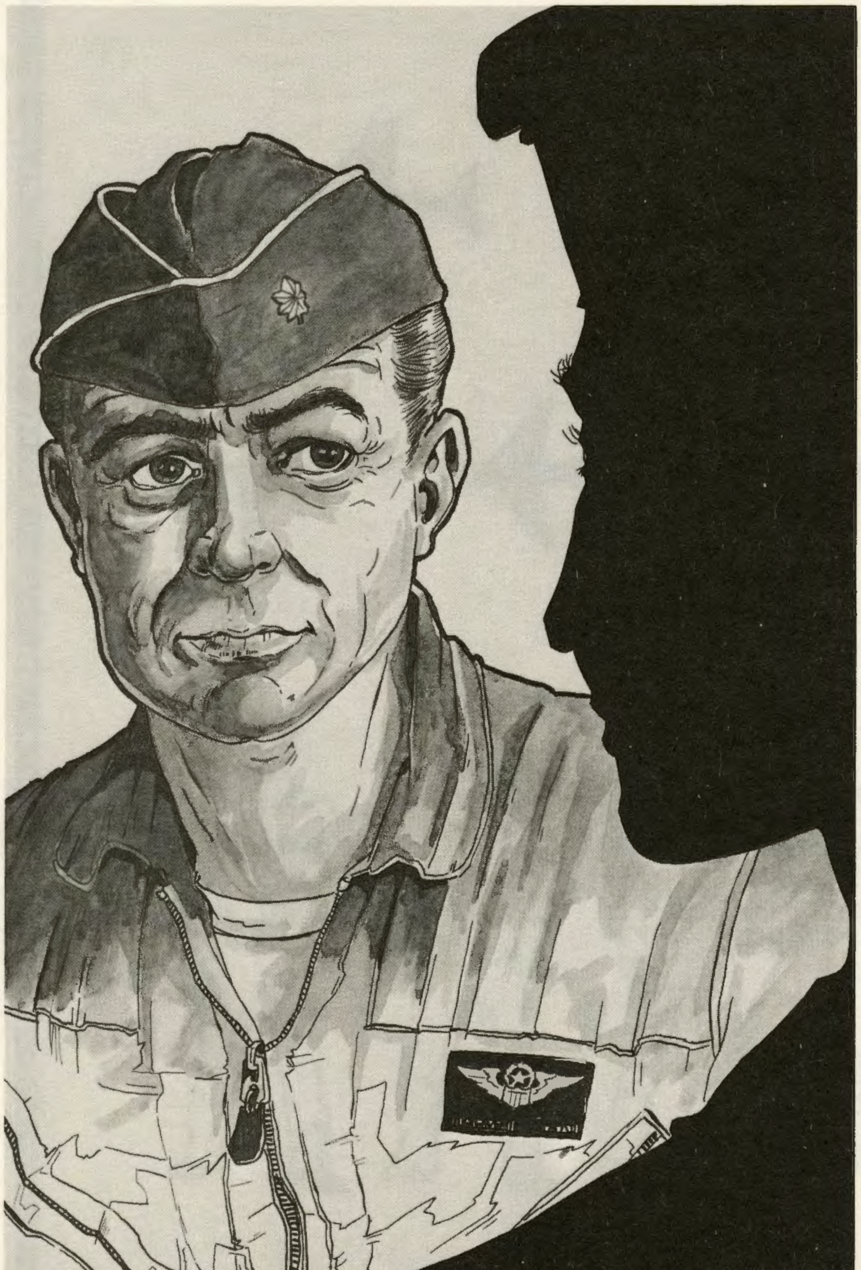


LOSSES IN THE AIR



GIBBER'S DOZEN BULLETS

how to survive a single-



By Maj John B. Gibbs
310 TFTS
Luke AFB, Arizona

As this crusty old major was leaving my last assignment, a shiny new lieutenant asked me, "How do you keep from killing yourself flying single-seat fighters?" You would think after all these years I'd have a good answer, but all that came to mind was, "Don't fall asleep while flying." True, but very weak. Embarrassed to the point of academia, I sat down and wrote this. I hope it says something useful to present and future single-seat lieutenants. I'd like to see you all live to be crusty old lieutenant colonels.

Dear Lieutenant Whoever,

Forget my last answer. It was Friday night and very late. Here's a dozen bullets. This ought to be enough ammo to last you a career.

● **Goals.** This may seem like an overused term, but it is the most important aspect of flying to me. Not only does the squadron need goals to know where it is going, not only do you need goals to keep improving, but each mission and mission segment needs goals. Without them, flights become lax; discipline suffers. Fighter pilots must be

OR

seat fighter

challenged. Idle hands and all that.

●**Instruments.** You must be the best instrument pilot there is. Handling complex situations or emergencies in the weather is not the time to discover you have no crosscheck. I know "sunshine IFR" is not the best place to develop good instrument habit patterns, but be honest with yourself—use a chase and really fly heads down now and again. Don't pencil-whip those approach requirements. Use your time in the simulator effectively; work on instruments, not trying to depart it or zoom to 100,000 feet. If it has visual capability, crank in a 300-foot ceiling and 1 mile vis. ***Instrument flying is as important to single-seat flying as BFM.***

●**Blindfold Cockpit Check.** Have you done one since UPT? I can't always put my fingers on every switch the first time, but I can find every switch (and change TACAN channels) without looking. When it's IMC or night on the wing, I want to be able to handle the situation or the emergency without taking my eyes off the primary attitude indicator.

●**Humility.** Be humble (occasionally anyway). Don't let your ego hide poor or unsafe habit patterns. Listen to other people. Listen between the lines; criticism is sometimes veiled. Be critical of yourself. Being positive, not negative, makes a big difference in your flying attitude.

●**Efficiency (or economy of effort).** Organize your cockpit. Depending on the flying demands, place your checklists where they can do you some good, not where they require unnecessary movements or where they compete for your attention. Develop and use good habit patterns. Organize your missions in the same way. "Cosmicity" kills in my book. Simple tactics with straight forward backups always work best, especially in combat. One of my squadron commanders put it best: "To the IP you are a clock; to the target you are a bomb." KISS (keeping it simple) is a proven technique.

● **Regulations.** ***Know*** them. How many accident reports have you read that might have been avoided if the pilot had ***followed*** regulations, known the Dash One better, or used common sense (see below). In today's Air Force, there's plenty of challenging tactical aviation ***within*** the regulations. If you don't like them, don't disregard them.

●**Sense (as in common).** I like to say that the rules of engagement we fly with are a replacement for common sense. We all know that most ROE was developed from accidents where someone had a lapse in common sense for one reason or another. Be aware of the impact of your decisions. Don't hesitate to make them, but use your head. Addendum for leaders: Treat your people as if they can think for themselves, or they will prove your worst suspicions to be well-founded.

●**Realism.** Try to achieve realism on all sorties. Incorporate fence checks into all missions. However, being "over realistic" is very dangerous. Losing a combat aircraft in a noncombat situation, because you pushed yourself or your wingman over the limit, is inexcuseable.

●**Unnatural.** If it feels unnatural, (i.e., night weather formation) there's a good reason for it. It's your mind telling you to back off. You may be pushing the limit of your gas or your low altitude comfort level or the regulations. Listen to your personal warning device.

●**Lead (not led).** Every single-seat fighter pilot should be a leader. Just because you are a wingie doesn't mean you don't lead. Do you participate in mission preparation and debrief, or do you do as told? Do you tell your leaders what really went wrong, or do you just gripe at the bar? Don't let bad leaders lead you down the wrong path.

●**Emergencies.** Again, keep it simple. Have a plan to get your jet on the ground, wheels down, safely. Develop rules of thumb that allow you to maintain control while you analyze the situation. Climb, stabilize, cope. Don't kiss off your emergency procedure practice sessions. Learn from others' mistakes and situations.

●**Safety.** Added to make an even dozen. Seriously, if you follow all the above rules, safety will take care of itself.

Well, Lieutenant, good flying to you. Of course, the worst flying I ever had was great.

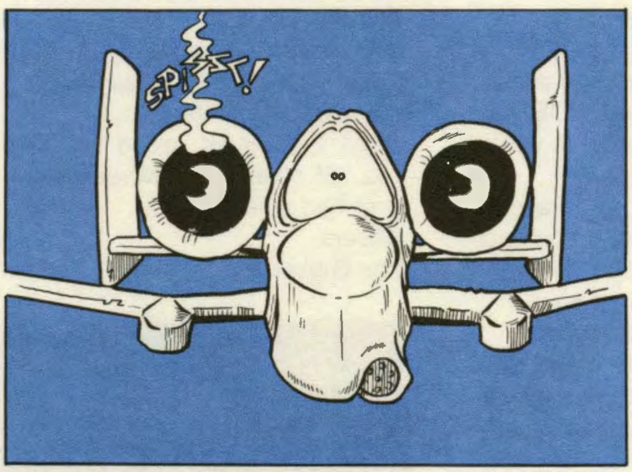
Cheers,
The Gibber

After he received his BS from Baylor University in 1968, Major Gibbs went to pilot training in Laredo AFB, Texas. Since then he's flown the 0-2A in Vietnam; the OV-10A in Thailand and at Hurlburt Field, Florida; the A-7D at England AFB, Louisiana; and the F-16 at Hahn AB, Germany. While in Germany, he was also at the HQ USAFE Command Center at Ramstein and Chief of the Command Post at Hahn. He's currently an F-16 IP at Luke AFB, Arizona, and has over 3,370 hours flying time.

TAC tips INTEREST ITEMS,

Dense

During a functional check flight, the A-10 FCF pilot shut down his right engine according to the Dash Six checklist. At 12,500 feet MSL and around 160 knots, with the auxiliary power unit (APU) running smoothly, he tried to restart the turbine. After an initial rise, the ITT (inter-turbine temperature) warmed up in a hurry. The pilot shut down the engine again as the ITT climbed through 860 degrees, but the temperature reached 1,000 degrees before cooling off again. The pilot limped home on his Warthog's one good engine.



Maintenance troubleshooters couldn't find any damage or good reasons why the engine acted up. The aircraft flew another FCF without engine problems and, as far as we know, is still behaving itself.

So what happened? The FCF profile requires an APU-assisted airstart at 10,000 feet MSL. And the flight manual advertises that the APU will provide adequate air pressure and flow for starting an engine at altitudes up to 10,000 feet. We found out that the APU will run smoothly at 12,500 feet, but won't put out enough air pressure to keep a starting engine's temperature in the green.

The weather guesser may have helped uncloud the issue even further: you see, this episode happened in the great southwest during July when the surface temperatures can hover around 115 degrees. *Density* altitude varies proportionally with *temperature*. That means the *density* altitude may have been as much as 2,000 feet higher than the pressure altitude the pilot was looking at on his altimeter.

Caution Arny owners

What's the first cockpit indication of the oil quantity in one engine being so low that the constant speed drive (CSD) begins to fail and causes an unstable phase/frequency between the two generators?

A. The affected engine's generator warning light will illuminate when the generator drops off the line.

B. The bus tie will open.

C. All the aircraft heading indicators (in primary and standby) will freeze and be unusable for the remainder of the flight.

Good question. Let's start from the top. Each J-79 engine holds 5.3 gallons of oil. If enough oil (about 2.8 gallons) oozes out of the reservoir, CSD failure will in fact light up the applicable generator warning light. That's why the Dash One says single generator failure may be an early indication of oil failure. But before the CSD gives up the ghost, the frequency differential between the two generators should cause the bus tie to open. For years aircrews have regarded the Bus Tie Open light (with both generators operating) as the indication of an out of phase condition. So in a *vanilla* F-4, answer B is probably the first cockpit indication. Not so in an Arny jet (ARN-101-equipped F/RF-4). Answer C is the longest choice. Let's see why it's correct: the power supply for the ARN-101's IMU may shut down in response to the phase/frequency oscillations *before* the bus tie opens. Apparently, the IMU is more sensitive to power fluctuations than the system that was intended to protect it.

Slippery survival gear

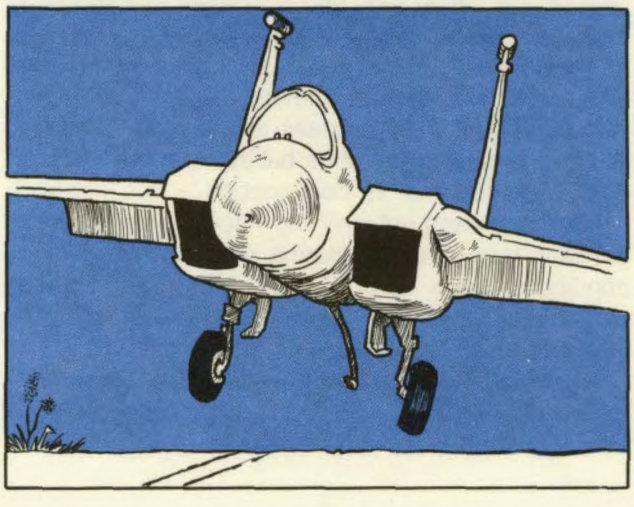
According to the Navy's *Weekly Summary*, a couple of maintenance workers on the deck of a carrier were unexpectedly blown overboard by the exhaust from a turning aircraft. They were properly attired in survival gear, but once in the water, they experienced great difficulty in opening their sea dye marker packets. One of the survivors managed to work one packet partially open; the other man just couldn't open his. The men said the sea water made their hands slippery and required excessive force to even partially open the little varmints. The dunkees and their CO invite you to deploy a sea dye marker with wet hands—it's an eye opener.

Guess where the Air Force gets its sea dye markers—from the Navy. Wet hands can also complicate using some of the other treasures hidden in our survival kits. And more than one pilot has commented about the difficulty he had releasing the Koch fittings on the parachute risers while wearing wet flying gloves. Could you release yours? Think about it.

Now that warm weather's here and many units are scheduling annual water survival training, maybe you could arrange some slippery hands-on training.

First brick

When his landing gear didn't come up after he raised the handle on takeoff, an F-15 pilot put the handle back down and decided to burn down fuel for landing. With reliable gear down indications, he was flying multiple radar approaches when the Antiskid warning light came on. Now he made



arrangements for an approach-end arrestment and brought the Eagle around for landing.

Unfortunately, he landed on the first brick—the wheels touched on the first few feet of the runway, but the tailhook hit in the overrun. And before the hook completed the 1,000 plus-foot trip to the cable, it was damaged by several collisions. The first contact in the obstacle course was with a threshold light. This collision sheared the mounting bolts and ripped the wear pad from the hook. Then the hook tried to grab a raised portion of one of the concrete slabs of the runway which caused the hook to skip over the cable.

When the pilot realized a missed engagement, he went around for another try. But even though this touchdown was more like TACR 60-2 Q criteria for landing, the hook missed the cable again. The pilot elected to keep the aircraft on the ground this time and brought the Eagle to a halt on the runway.

With the misalignment of concrete slabs just before the cable, who's to say the lad wouldn't have missed the engagement if his first landing had been on the money? Then again, who's to say the initial damage caused by the short landing didn't magnify the problem?

A number of airfield managers and civil engineers at a number of locations are working hard to fix the runway hazards that cause hook skip. Looks like we can help.

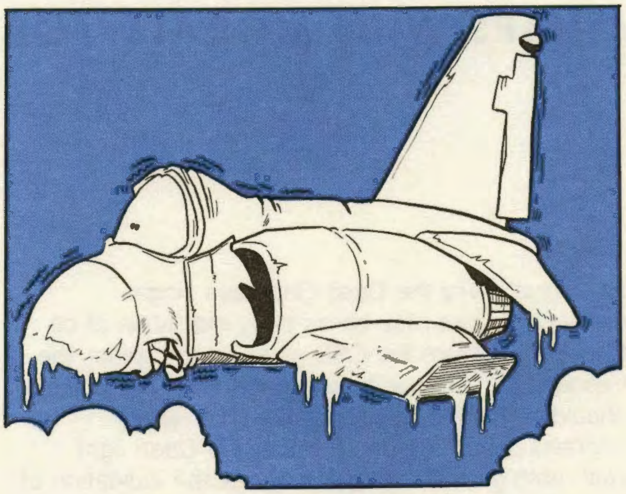
Brrrrrrrr

Sitting on the runway with the canopy down on a sunny summer day waiting for clearance to take off, the sweat runs into your eyes and stings so badly you can hardly see lead. Have you been there? Or haven't you climbed out of the cockpit drenched with sweat following a low-level mission in July or August when it's 100 degrees on the ramp? Times like these make many of us believe that the F-4's cockpit could never be cool enough.

But there I was out over the Pacific, halfway between Hawaii and California, when my air conditioner stuck *full cold*. It was plenty warm when we took off, so it wasn't that uncomfortable when I first noticed it. I could hack it.

A few minutes later it was a little chilly, but I was busy refueling. Once off the boom, my backseater and I went through the checklist for extreme cockpit temperatures. But since we were up around 30,000 feet, I didn't pull the vent knob—it wasn't bad enough to depart the flight and descend below 25,000 feet where the aircraft could be depressurized.

About thirty minutes later I felt like I was freezing.



I was shivering uncontrollably. When I looked in the mirror, I saw icicles attached to my mask near my exhalation valve. I asked around the flight if any one had ever run into this on a deployment before. One old, crusty guy had and told me to—

1) Descend to 25,000 feet MSL.
2) Set the air conditioner's controls to auto/full hot.
3) Push the defog/footheat lever full forward.
4) Slowly pull out the vent knob to depressurize the aircraft.
5) Wait about 5 minutes with the cockpit depressurized.
6) Suddenly slam the vent knob back.

It worked like a charm. Ice flew all over the cockpit, out of the air conditioning outlets and from the window defogger. Then heat slowly began filling the cockpits. We rejoined the flight above us and cruised uneventfully to destination.

I thought this was an isolated incident until last winter when a friend said he'd suffered frostbite on his toes when the same thing happened to his F-4's air conditioner on a flight back from Europe. So hang on to this; you may not need it now, but over the Atlantic or Pacific one day perhaps it'll be useful.

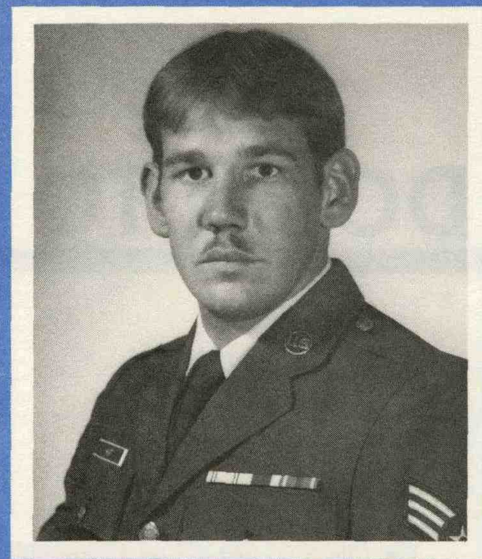
How do you remember these steps? Easy. They're actually the same ones in the checklist for extreme cockpit temperatures. Have a look. The only difference is a little patience.

SAFETY AWARDS

CREW CHIEF SAFETY AWARD

During an operational readiness exercise, SGT MARK T. HUNT was in the process of preparing his aircraft for taxi when he noticed an aircraft taxiing by that had the safety pin to the front ejection seat still installed; the pin and bag were on top of the seat. Sergeant Hunt took immediate action. He directed the aircraft to stop, connected the intercom, and informed the aircrew of the situation. If the safety pin had gone undetected, the pilot would not have been able to use the primary ejection handle.

Sergeant King's actions exemplify a dedicated crew chief. His attention to detail, quick assessment, and quick action reduced the potential for a serious mishap to occur.



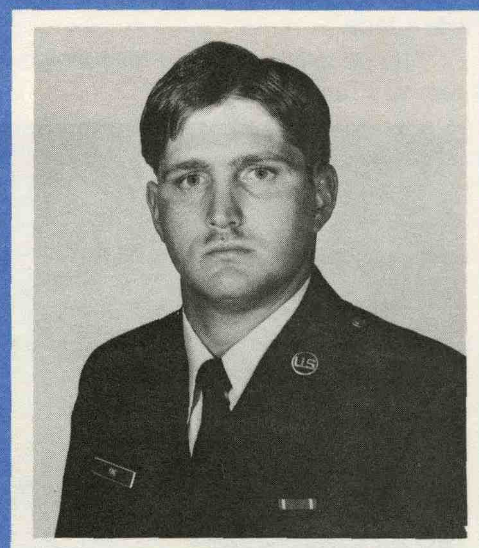
Sgt Mark T. Hunt
37 AGS, 37 TFW
George AFB, CA

INDIVIDUAL SAFETY AWARD

A1C JEFFERY P. KING was driving a forklift to a parked L-188 Logair aircraft when he spotted flames and smoke coming from the emergency brake of a 25 K-loader that was going toward the same aircraft. Airman King knew the aircraft contained Class B explosives, so he overtook the K-loader and warned the driver of the situation. The driver of the K-loader stopped his vehicle.

Airman King then stopped his forklift, chocked it, grabbed his fire extinguisher, and ran to fight the fire. When his extinguisher ran out, the fire was still burning; so Airman King looked for another extinguisher, found one near the aircraft, wheeled it over to the burning K-loader, and extinguished the fire.

Airman King displayed a high degree of safety awareness. He took control of a serious situation that minimized damage to the K-loader and kept the aircraft from being harmed.



A1C Jeffery P. King
832 Trans Sq
Luke AFB, AZ

DOWN TO EARTH

Funny excuses

The following are actual statements found on insurance forms where car drivers attempted to summarize the details of an accident in the fewest words possible.

"Coming home, I drove into the wrong house and collided with a tree I don't have."

"I thought my window was down, but I found out it was up when I put my head through it."

"I collided with a stationary truck coming the other way."

"A truck backed through my windshield into my wife's face."

"The pedestrian had no idea which direction to run, so I ran over him."

"I pulled away from the other side of the road, glanced at my mother-in-law, and headed over the embankment."

"I had been shopping for plants all day and was on my way home. As I reached an intersection, a hedge sprang up, obscuring my vision, and I did not see the other car."

"I was on my way to the doctor with rearend trouble when my universal joint gave way causing me to have an accident."

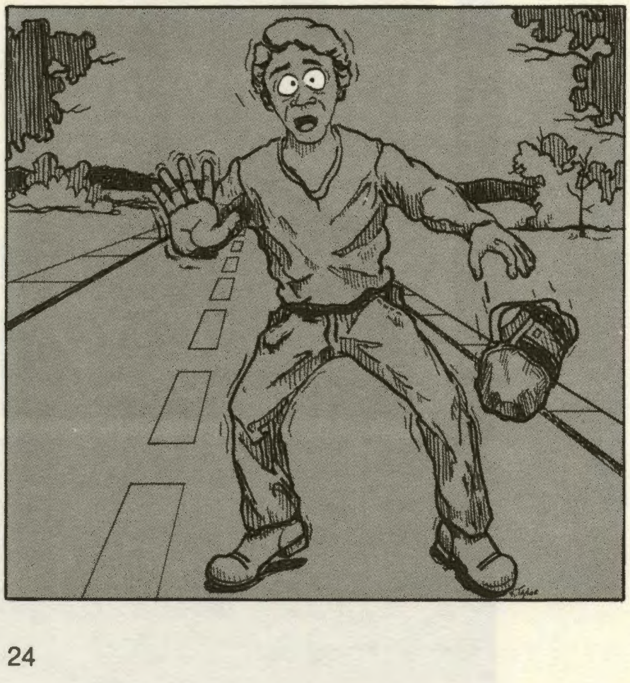
"My car was legally parked as it backed into the other vehicle."

"The guy was all over the road. I had to swerve a number of times before I hit him."

"A pedestrian hit me and went under my car."

"I told the police that I was not injured; but on removing my hat, I found that I had a fractured skull."

—Courtesy ATC



In need of a buddy

A group of seven airmen who were off duty headed for a local river for some fun in the sun. Once they arrived at the river bank, they all immediately entered the water. One of them, a senior NCO, talked to another NCO about swimming across the river. The senior NCO indicated that he wasn't confident enough in his swimming ability to attempt the crossing.

Shortly afterwards, two other members of the group swam across the river; and, as they were swimming, they tried to talk the senior NCO into following them. He began to. He made it halfway and then turned around to try to go back. He sank before he could get back. Some others in the group tried to reach him, but they didn't get to him in time.

Sheriff's department divers found his body four hours later.

When our good sense tells us that we can't hack it, we ought to listen—even if someone else tries to convince us that we can. But beyond that, even if we think we can swim the distance, we shouldn't try it by ourselves. Having someone near you just in case is called the buddy system. And that's what buddies are for—to help you out when you get in trouble, not to goad you into it.

Heat stress

After working or playing outside on a hot day, have you ever felt dizzy or had muscle cramps? If you have, then you probably had a reaction to heat stress.

Heat stress is a combination of environmental heat and physical activity that produces body heat. You have to have both to create heat stress. The body reacts according to the degree of heat stress, and sometimes a heat-related illness occurs. There are three heat-related illnesses: heat cramps, heat exhaustion, and heat stroke.

Heat cramps occur after hard physical activity in a hot environment. Loss of water is a factor, but lack of salt intake is what causes the cramps. Legs and stomach are where you'll probably get the cramps, and they will follow heavy sweating. To treat heat cramps you need to replenish the salt you lost; so drink a cool electrolyte solution, loosen clothing, and rest. If you don't have an electrolyte solution, drink any non-alcoholic fluids and eat something salty, like potato chips or pretzels.

Heat exhaustion (also known as heat collapse or heat prostration) takes longer to develop and results from loss of fluids and salt. Symptoms include profuse sweating, weakness, rapid pulse, dizziness, nausea, headache, and possible unconsciousness. Treat it by resting, drinking a cool electrolyte solution or any other non-alcoholic fluids, and cooling the body.

Heat stroke is the most dangerous of the heat-related illnesses. It's a failure of the body's cooling mechanisms. Symptoms of heat stroke are the same as heat exhaustion except that with heat stroke there won't be any sweating, the skin will be flushed and the body will be hot. Some people can collapse from heat stroke without any warning symptoms. Heat stroke is a medical emergency. Get the person to a hospital or doctor immediately. In the meantime the important thing to do is cool the body. Cool the body with water, bring the person into an air-conditioned room or put them in the shade, and remove as much clothing as possible.

You can prevent a heat-related illness by drinking plenty of fluids, increasing salt intake, wearing lightweight or light-colored clothes, and taking frequent breaks from the heat to cool down. Salt tablets are not recommended—eat salty foods; and alcoholic beverages are not recommended fluids because alcohol will dehydrate you even more. To combine the fluids and salt, you can buy an electrolyte solution at the grocery store.

It also helps to become acclimated to the heat. Start out slowly with a physical activity in the heat for about two hours a day for a week. That's all it takes. Once you're acclimated to the heat, it takes about two to three months to lose acclimation; however, a measurable amount can be lost in a few days. If you stay indoors in an air conditioned room for a whole weekend or if you have just returned from a trip to a cooler climate, expect your heat tolerance to be lowered.

AAFES Recalls Flint stone Xylophone. The Army and Air Force Exchange Service (AAFES) has recalled the Flint stone xylophone, a Gordy International toy. AAFES officials said legs on the orange plastic toy can be easily removed and swallowed by young children. They explained that toys posing such a hazard should carry a warning stating they are not recommended for children under three. Because the xylophone package doesn't carry this warning, AAFES has removed the toy for a refund. AAFES officials also urge parents to look for age recommendations and other safety labels when buying toys.

Pink Elephants. You don't have to drink to see pink elephants. Just stare at your computer and then glance at a white elephant. Some operators of visual display terminals (VDTs) that have green characters on a dark background have reported that when they switch to looking at white characters on a dark background, the characters would appear pink. They also noticed a pink fringe on white walls or the edges of white paper. (After looking at a VDT with amber characters, the fringe would appear blue-green.) This strange effect (called the McCullough effect) never lasted more than a day. The *New England Journal of Medicine* says the effect is normal, never permanent, and is not a symptom of hysteria or eye disease. Whew!

Car Restraints for Kids. As of February this year, the only states that don't have laws requiring the use of approved child restraints or seat belts for small children are Alaska, Idaho, Iowa, Louisiana, South Dakota, Texas, Utah, and Wyoming. Several of these states are expected to enact laws before the year ends. And at least one insurance company is offering a Century 200 child restraint device to policyholders at a significantly reduced price ($20—less than half the retail price). Check into it.

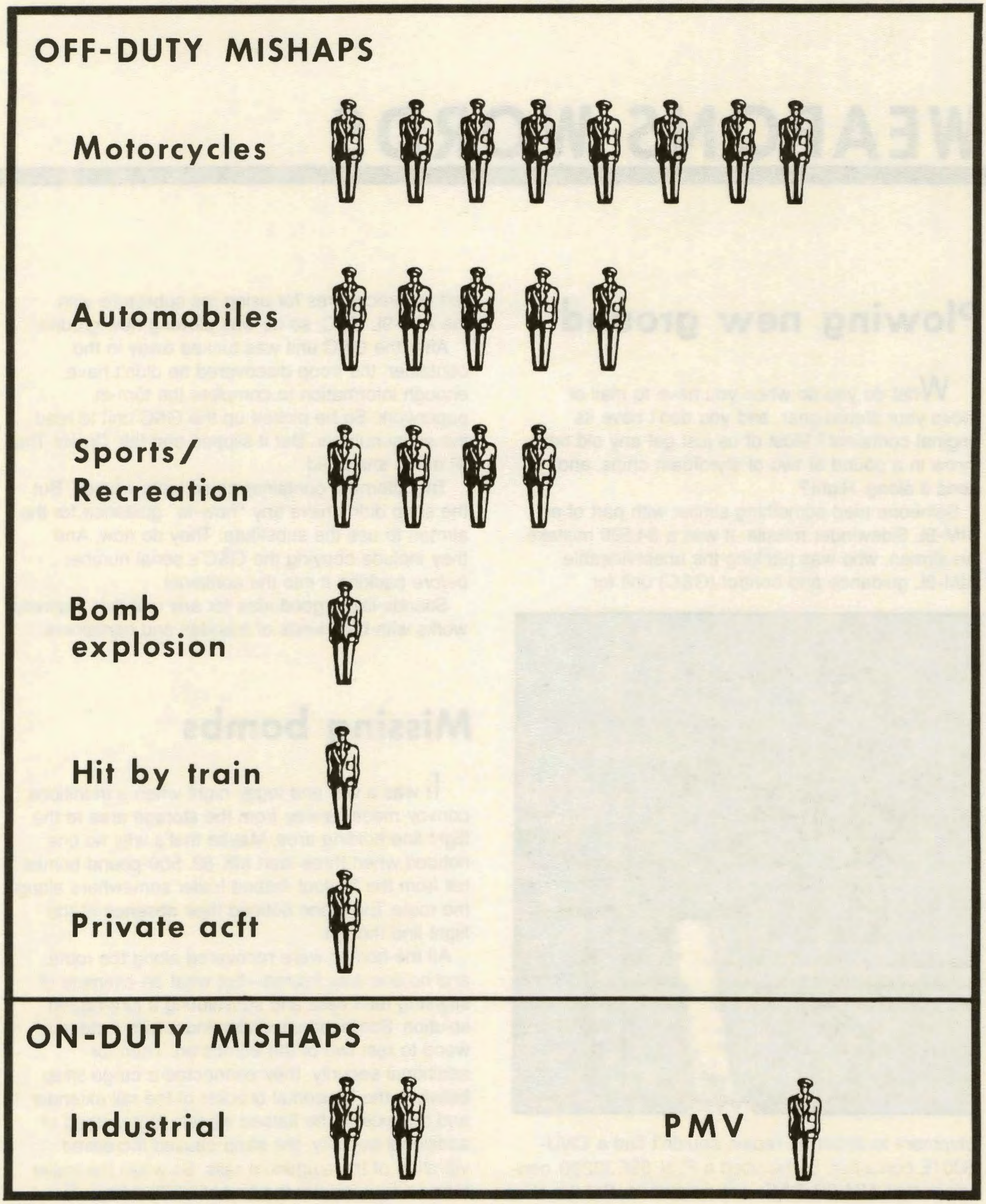
Bet You Didn't Know This. But sassafras tea is harmful. Sassafras contains safrole, an oil once used in root beer and some other beverages, that was banned by the FDA as a flavoring or food additive because it caused cancer in laboratory rats and mice. No one knows how much safrole it takes to be harmful, but one cup of strong sassafras tea contains about 200 milligrams of safrole—that's at least four times the minimal amount believed to be hazardous if used on a regular basis. Camphor is another known toxin—one teaspoon of camphorated oil can be toxic to a baby—the FDA has taken camphorated oil off the market, and over-the-counter products with more than 2.5 percent camphor can be dangerous.

Emergencies in Restaurants or Theaters. When entering a restaurant or theater, check out the location of the exits, and in case of an emergency, plan to use a different exit from the one you entered. Panicked people usually try to leave a building the same way they entered. In an emergency situation, that causes a backup at the exit and loss of precious time.

Conferences. Many hotels and motels set up for conferences by converting large rooms to smaller rooms using partitions. If there aren't two exits in each partitioned area, think twice before entering it. In case of emergency, having another exit could save your life.

Unplug the Toaster. The Consumer Product Safety Commission says fire departments respond to more than 20,000 fires a year that are associated with electrical appliances. To help prevent these fires, the Commission recommends unplugging appliances that produce heat (hair dryers and toasters) and are motorized (can openers and drills) when they aren't in use. Also unplug any appliance near a source of water.

Our TAC Losses on the Ground JAN-JUN 84

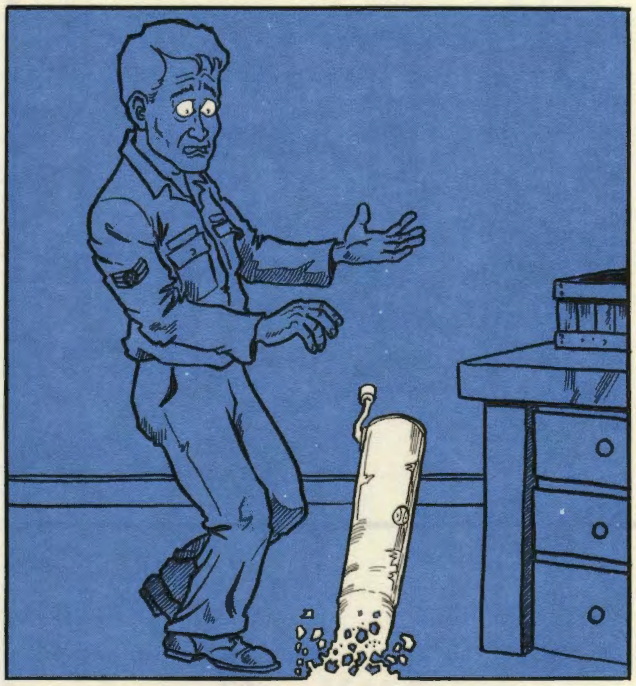


WEAPONS WORDS

Plowing new ground

What do you do when you have to mail or move your stereo gear, and you don't have its original container? Most of us just get any old box, throw in a pound or two of styrofoam chips, and send it along. Right?

Someone tried something similar with part of an AIM-9L Sidewinder missile. It was a $4,500 mistake. An airman, who was packing the unserviceable AIM-9L guidance and control (G&C) unit for



shipment to depot for repair, couldn't find a CNU-300/E container. So he used a P/N 69F33200 container that AIM-9P G&Cs are packed in. But the shop had no procedures for using the substitute with the AIM-9L G&C; so he was plowing new ground.

After the G&C unit was tucked away in the container, the troop discovered he didn't have enough information to complete the turn-in paperwork. So he picked up the G&C unit to read the serial number. But it slipped and fell. Crash! The IR dome shattered.

The alternate container could have worked. But the shop didn't have any "how-to" guidance for the airman to use the substitute. They do now. And they include copying the G&C's serial number *before* packing it into the container.

Sounds like a good idea for any unit that routinely works with both kinds of missiles and containers.

Missing bombs

It was a wet and foggy night when a munitions convoy made its way from the storage area to the flight line holding area. Maybe that's why no one noticed when three inert MK-82, 500-pound bombs fell from the 25-foot flatbed trailer somewhere along the route. Everyone noticed their absence at the flight line though.

All the bombs were recovered along the route, and no one was injured—but what an example of slighting tech data and substituting a jury-rigged solution. Someone used aluminum rails instead of wood to rest two of the bombs on. Then for additional security, they connected a cargo strap between the horizontal bracket of the rail extender and the axle of the flatbed wheels. But instead of additional security, the strap caused increased vibration of the aluminum rails. So when the trailer made a turn, one of the bombs shifted from its chained position and fell off the flatbed. With that bomb missing, the chain, that ran the length of the trailer, developed some slack which allowed the other bombs to shift and fall.

One thing that might have prevented the embarrassment was the alignment of the lugs on the bombs. Had they been turned to face either up or down, like the TO suggests, the lugs may have caught on the chain on top of the bombs or the rails beneath them

Shortcuts plus imaginative attempts to make up for them equal trouble. Good thing the bombs were inert. But we can't always count on that, can we?

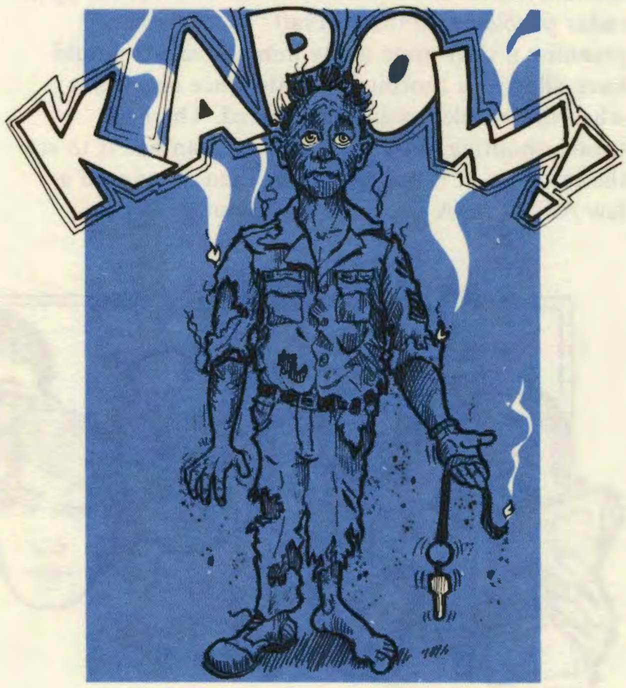
It takes two

A weapons specialist on a load crew was loading a BDU-33D/B practice bomb on station six of a SUU-20 dispenser. He had one hand on the bomb, back near the fin. With the other hand he tried to insert a safety pin into the rack housing. Before the pin went in, the bomb fell to the concrete and discharged. Kapow! Even though the older type safety block was installed on the nose of the bomb, the BDU's spotting charge fired.

The blast caused damage to the SUU-20, a MK-106 practice bomb on an adjacent station, and the crew chief. It singed the hair on his arm, dumped phosphate dust on his neck, and sent him to the hospital complaining of hearing problems.

Apparently there will be no permanent complications, but it was close. The fellow learned a tough lesson. Local directives require *two workers* to upload BDU-33s—for good reason: the practice bomb weighs only 25 pounds, but it caught the man by surprise when it fell. He thought he could stop it, but he wasn't able to because the majority of the bomb's weight is up front in the nose, and his hand was back near the bomb's tail. And his concentration was on the safety pin. His hand and his concentration were in the wrong places to prevent the bomb from falling.

That combination stacked the cards against him. Loading bombs doesn't have to be a gamble. We just need to concentrate on doing it according to Hoyle—or in our case, according to local procedures.



Letters to the Editor

Dear Editor

Just a few lines to clear up an error in an otherwise excellent article, "Asking for It," April 1984, and to raise a couple of questions that were unasked.

First, the magnetron mentioned in your article is the device used to generate the transmitted radar energy, not receive it nor display it.

Second, why didn't the crew have the launch truck weapons control system technician check out the problem? He or she is the expert on the *entire* radar system and quite possibly could have cleared the malfunction in a few minutes. Was there a history of radar problems on this aircraft? If so, perhaps planning a show time a few minutes earlier would have allowed a thorough maintenance check-out when the problem was encountered. The best troubleshooting aid a maintenance man has is to see the problem as it occurs, rather than relying on a few AFTO 781A lines and ten minutes in maintenance debriefing.

Third, from a crew member's point of view, why didn't the crew follow the old maxim, "If you don't know what it does, don't mess with it"? Isn't "fire, smoke, and fumes" considered an inflight emergency? Most all of the Dash Ones I have encountered prohibit reapplication of power to a system causing smoke and/or fumes unless the cause is known *and corrected.*

It appears this is another case of currency and training requirements clouding normally sound judgment. Let me tell you from firsthand experience, an inflight fire is not something to be taken lightly. It can get very hot very quickly, especially in the close confines of a fighter type aircraft.

Thanks for letting me get this off my chest, but every time I read about an incident like this, it really bugs me.

Respectfully
Roy W. Adams, Jr., MSgt, USAF
Chief, AWACS Airborne Radar
Technician Training

Dear Sergeant Adams

Thanks for correctly describing the magnetron. We can't answer why the aircrew didn't call for a redball. Let's give them the benefit of the doubt because we don't know the history of the aircraft's radar; perhaps the initial indications of trouble weren't as cut and dried as it sounded.

We share your concern that the crew apparently did not take the emergency more seriously. Yes, electrical fire/smoke and fumes are F-4 emergency procedures. When we read about an aircrew slighting them, it may bug you and me—but it could really burn them up.
Ed

TAC TALLY

	TAC JUN	TAC THRU 1984	TAC JUN 1983	ANG JUN	ANG THRU 1984	ANG JUN 1983	AFR JUN	AFR THRU 1984	AFR JUN 1983
CLASS A MISHAPS	5	13	14	0	3	6	0	0	0
AIRCREW FATALITIES	2	10	4	0	2	4	0	0	0
TOTAL EJECTIONS	6	10	11	0	2	5	0	0	0
SUCCESSFUL EJECTIONS	6	9	10	0	2	2	0	0	0

TAC's TOP 5 thru JUN 84

TAC FTR/RECCE class A mishap-free months	
55	355 TTW
34	58 TTW
27	4 TFW
23	405 TTW
21	27 TFW

TAC AIR DEFENSE class A mishap-free months	
137	57 FIS
90	5 FIS
87	48 FIS
46	318 FIS
37	87 FIS

TAC-GAINED FTR/RECCE class A mishap-free months	
146	188 TFG (ANG)
138	138 TFG (ANG)
137	917 TFG (AFR)
115	114 TFG&174TFW(ANG)
110	112 TFG (ANG)

TAC-GAINED AIR DEFENSE class A mishap-free months	
120	177 FIG
86	125 FIG
69	119 FIG
53	107 FIG
44	147 FIG

TAC/GAINED Other Units class A mishap-free months	
179	182 TASG (ANG)
163	110 TASG (ANG)
159	USAFTAWC
150	84 FITS
93	552 AWACD

CLASS A MISHAP COMPARISON RATE

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

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	1984	3.4	3.4	2.8	2.0	2.6	3.5						
TAC	1983	6.9	5.3	3.4	3.8	4.0	3.9						
ANG	1984	0.0	2.3	1.5	2.2	2.6	2.1						
ANG	1983	9.1	7.0	4.4	4.3	3.4	4.2						
AFR	1984	0.0	0.0	0.0	0.0	0.0	0.0						
AFR	1983	0.0	0.0	0.0	0.0	0.0	0.0						

US GOVERNMENT PRINTING OFFICE: 1984-739-022/2


FLEAGLE
A LONG VACATION IS FUN AN' RELAXIN', BUT IT'S NICE T'BE BACK AT TH'OLD SQUAD.
TH' SQUAD HEADQUARTERS
IT DO LOOK LIKE A GOOD DAY.
I SURE DO MISS THIS WHEN I'M AWAY FER AWHILE.
HARRISON
NOW FER A FEW SLICK MOVES T'CLEAN OUT TH'OLD COBWEBS.
© STAN HARRISON 1984
?
MY WORD!!
SPATTER!
THOT YOU SAID FLYIN' IS LIKE SWIMMIN'?
NO, IT'S MORE LIKE DIVING. BUT YA'DON'T TRY A 2½ GAINER LESS YOU'RE PERFICIENT.