TAC ATTACK

MAY 1984

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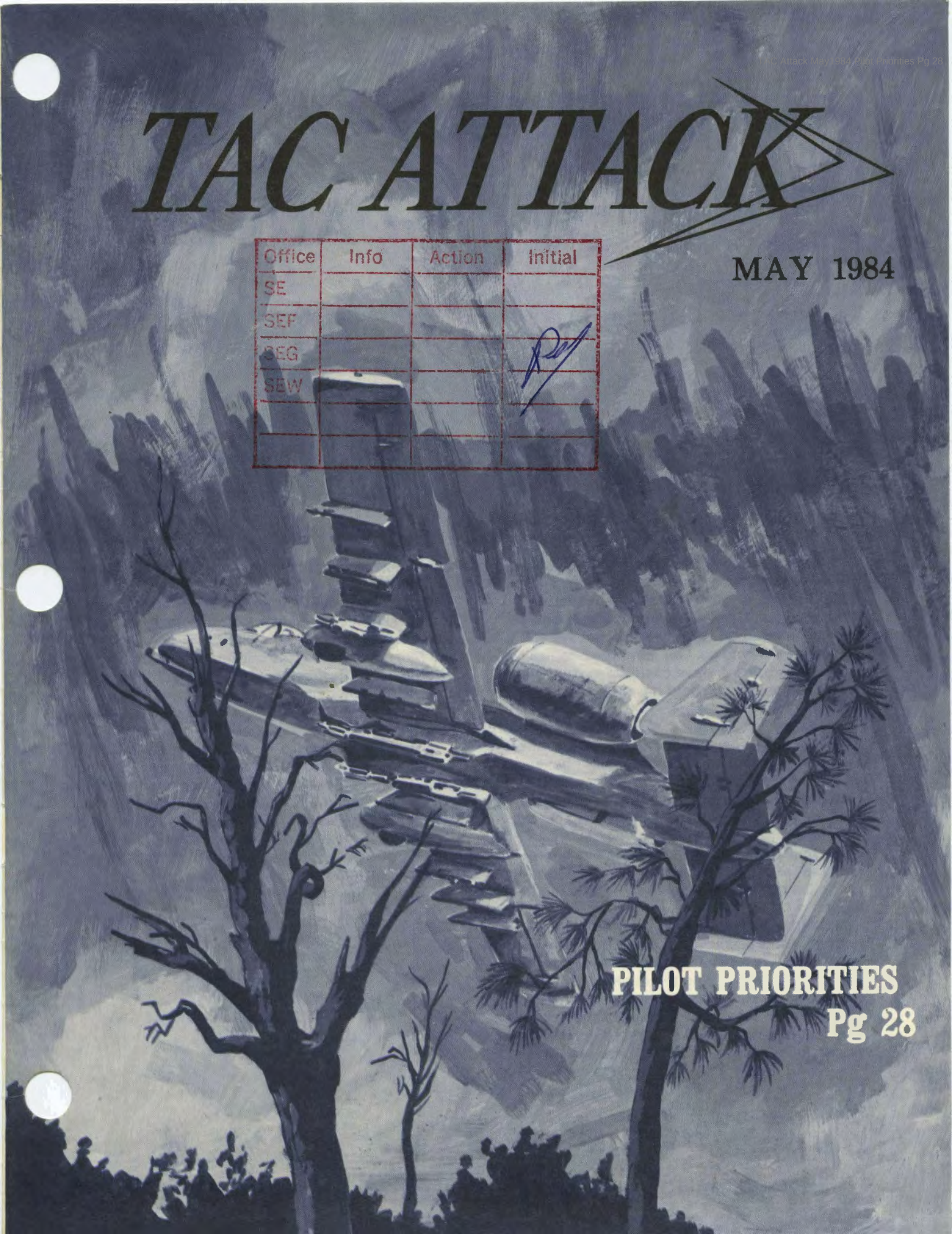

PILOT PRIORITIES
Pg 28

ANGLE OF ATTACK

As you'll see later from the TAC Tally on page 31, we've continued our downward trend in Class A flight mishaps into 1984. We're headed in the right direction. However, when we look closely at our recent aircraft losses, we see that we still have a long way to go. Our command-controlled rate (things that we have control over that could have been changed/could have prevented the mishap) is very disturbing.

Recent collisions with the ground, out-of-control mishaps, and midairs contain elements of aircrew members overextending themselves -- believing their own capabilities, or those of their aircraft, better at a point in time than they really are. Why? Training, proficiency, experience? Perhaps. But what about personality? The individual's *attitude* about imposed rules or minimums has a lot to do with his *response* to them. *Out of the abundance of the heart the mouth speaketh* -- and the hand doeth.

Out attitudes dictate how we respond to restrictions, procedures, and minimums. There are three ways we react. First, we can add our own buffer, such as doubling the minimums, or adding ten knots for Mama, and somehow think we're safer -- never mind about the mission. Next, we can deliberately disregard all those cumbersome restrictions that only exist for those with less common sense and flying ability than we -- after all, we've got a reputation to uphold. Or, lastly, we can be the disciplined professionals who successfully accomplish the mission again and again -- by the book.

Most of the time, we operate in the last category, professionally. However, sometimes a combination of events puts us in a position that challenges our true attitude. In those cases, the outcome will be determined by a snap decision. That decision will be driven by what's in our heart.

What's important? What's the object of pressing the limits in those instances? Pride? Reputation? Is the risk worth the consequences? Of course not. Decide now. Put it in your heart now. When your opportunity comes to make that snap decision, you'll respond according to what you've already decided is important. Heart-check.

Harold E. Watson

Harold E. Watson, Colonel USAF
Chief of Safety

ON THE COVER:
PILOT PRIORITIES,
Aircraft control and
ground avoidance.

MAY 1984

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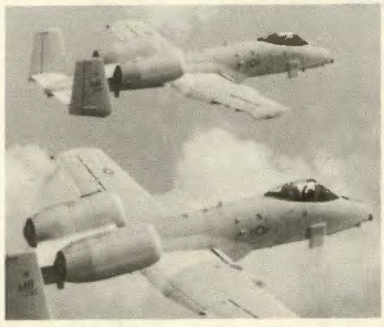
Aircraft surge launch and recovery

ASLAR

A new way to get down



by Maj Bob Keeney
HQ TAC Stan/Eval

"There I was in my Eagle jet, at 20,000 feet, in the holding pattern, waiting my turn to penetrate." It doesn't have the makings of a real war story—or does it? In peacetime, we aircrews have deformed many a seat cushion in similar situations; watching the gas gauge decrease while the DME does not; wondering where, when, and how we were going to land. More than once, while on low altitude vectors or overshooting ILS final, we mumbled unfavorable comments regarding the intelligence, skill, and parentage of the air traffic controllers who worked our flights. After all, it's their fault the system is inflexible, right?

In fact, the air traffic system was never designed for a surge recovery of fighters—until now! Aircraft Surge Launch and Recovery (ASLAR) is an Air Force readiness initiative, now being implemented by several commands, that will more than double our present capacity to recovery aircraft in IMC. Stated another way, ASLAR will allow controllers to clear aircrews for TACAN approaches virtually as fast as they check in. The interaction

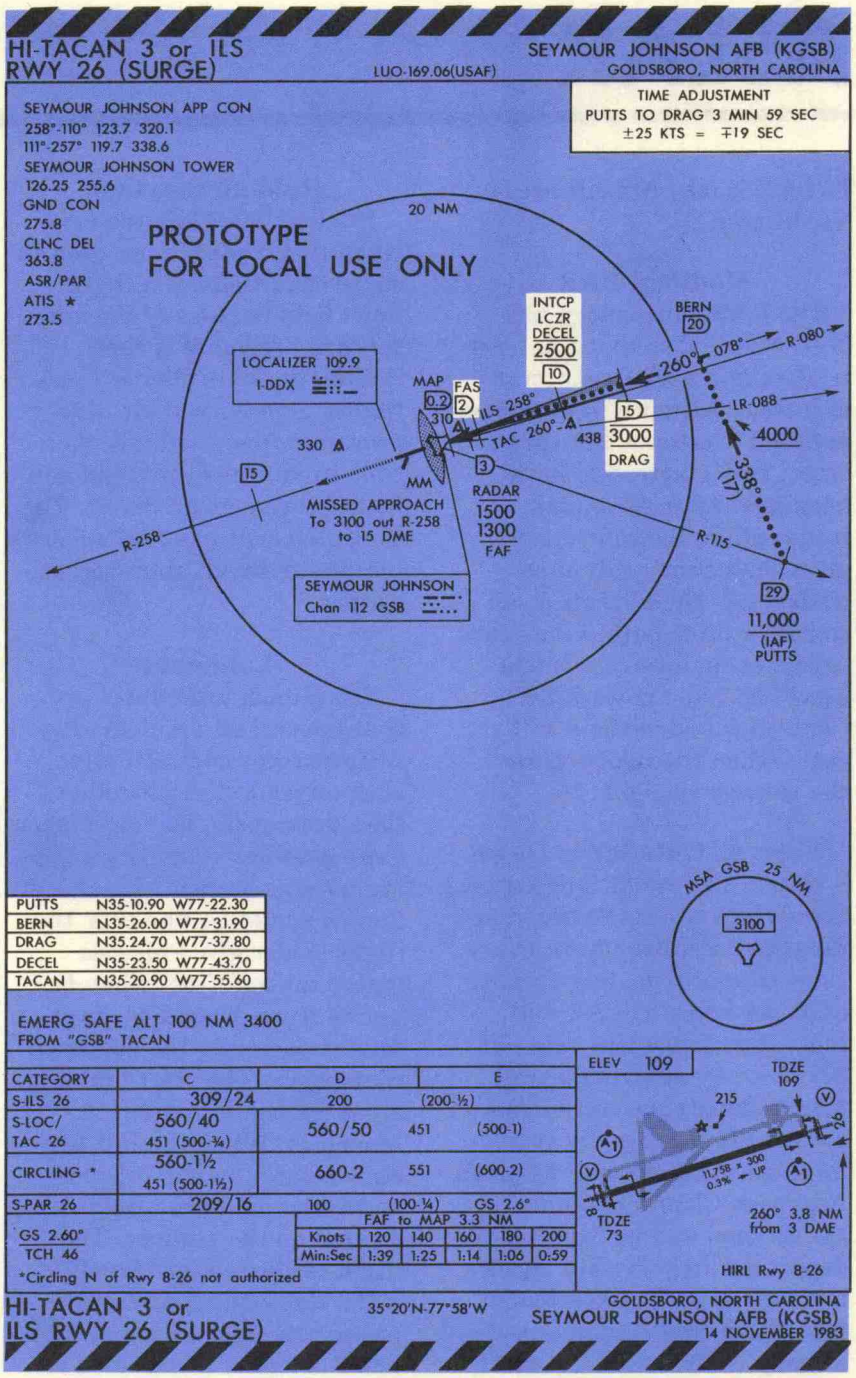
between aircrews and controllers has been improved by changing some of the rules.

Here's how it works:

Approach

Flight leaders split flights into two-ships prior to entering the terminal area, and they obtain field and weather information from ATIS, or another non-ATC source. The flights maintain 300 KIAS unless given a speed adjustment by the controller. (Yes, this even applies to Hog drivers.) The controller will use speed differential instead of vectors to create separation between flights when necessary. After identifying a flight, the controller clears it for a TACAN approach, and the flight leader maintains 300 KIAS (or his adjusted airspeed) until arriving at a point on the profile designated as the *DRAG* point. There, the flight leader transmits "DRAG" plus the altimeter setting, and the wingman uses reduced power and speed brakes to slow to 180 *KIAS*. Five miles later on the approach (at the DECEL point), the leader uses the same technique to slow to 180 KIAS, producing two miles of separation. Instead of this procedural drag, fighters equipped with accurate air-to-air radar (F-15, F-16, F-4, F-106) may take spacing any time prior to the *DRAG* and fly a radar trail approach (under ASLAR, standard radar trail formation is increased to 2 NM).

After the split-up, both aircraft maintain 180 KIAS until a point approximately three miles from the threshold, the Final Approach Speed (*FAS*) point. At the FAS, each aircraft slows to its computed final approach airspeed.



Note that a flight of Eagles looks the same to the controller as a flight of A-10s until the *FAS* point. Because of this new element of predictability, ASLAR has reduced required separation on final from 3 NM to 9,000 feet.

When the Base TACAN Is Out

The TACAN-out scenario is the same as described above, except that the controllers provide vectors along the approach path and call the speed-reduction points. To provide a positive final approach when the

TACAN is out, ASLAR uses a "modified PAR."

Modified PAR

The PAR phraseology has been modified so that final controllers can work two aircraft at a time. Azimuth instructions are "soft" vectors ("left three," "right two") instead of hard headings. After glide path interception, the controller gives instuctions only if required, i.e., the aircraft is off course or glide path. Pilots can expect enough corrections to know the radio is working. Controller instructions will cease when the pilot reports the runway in sight.

When ATC Radar Is Down

When ATC radar fails today, the system reverts to timed approaches, resulting in recovery rates of approximately 15 aircraft per hour. ASLAR will more than triple this rate (50 per hour) by allowing a two-ship to depart the Initial Approach Fix (IAF) every two minutes. Aircrews will be given Approach Clearance Times (*ACTs*) and will be expected to depart the IAFs within 20 seconds of the *ACT*. Experience has shown that most aircrews already in the holding pattern can meet the *ACT* within the 20-second window, and if they can't, the approach plate will provide them with an airspeed correction to put them back in the window. The *DRAG* and *DECEL* points are reporting points that ATC uses to determine if separation has been met.

Holding/Playtime

Holding is seldom required when ATC radar is up, even in surge conditions. If a flight must hold because of the simultaneous arrival of several flights, the controller will ask flights to provide their *playtime*. *Playtime* is simply the time in minutes the flight can hold before it must divert. The controller will use this information to assign approach priorities.

Launches

The launch procedures are, again, based on predictability. ASLAR recoveries actually pack aircraft closer together than previously, leaving bigger gaps elsewhere, and these gaps are used as launch windows. A launch would go like this: the flight leader gives his estimated takeoff time (when he knows it) to ground or tower. This is passed to the approach controllers, who start building a gap for the formation to launch in. When the last aircraft before the gap touches down, the departing flight is cleared on the runway. The flight is cleared for takeoff when the landing aircraft passes the departure-end cable, and the leader is expected to release brakes within 20 seconds after takeoff clearance. Contrast this launch with the present system in which the controller, not knowing how much time the flight will spend on the runway or how big a window to build, simply holds the flight for takeoff indefinitely.

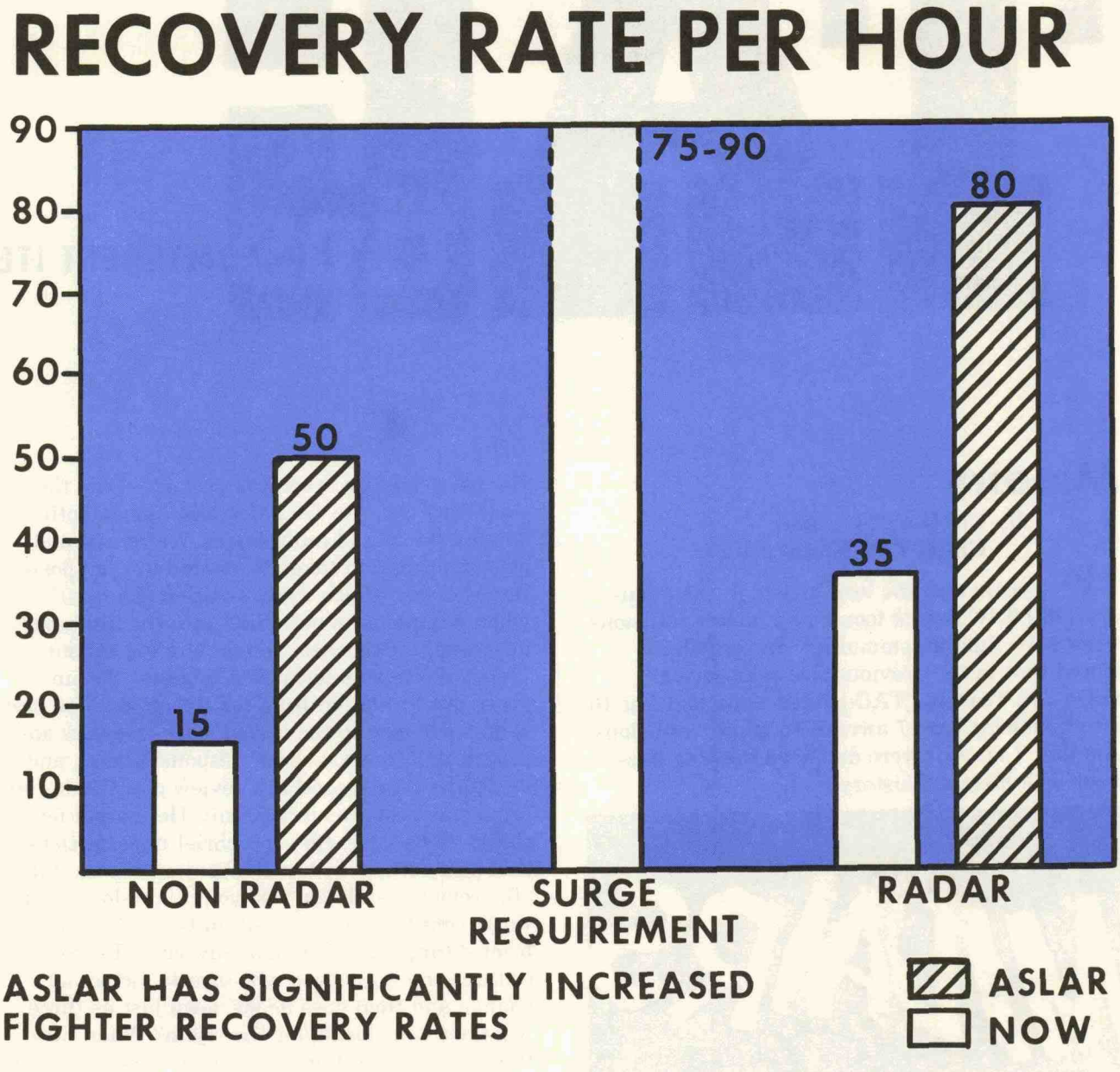
Gotchas

There are two areas of an ASLAR approach that deserve extra pilot attention. First, when the flight leader calls *DRAG*, the wingman performs what is essentially a "lost wingman" maneuver. The difference is that he is straight and level, knows his flight conditions, and is mentally prepared to decelerate and resume the approach as a single-ship. (Note: The deceleration [from 300 to 180 KIAS] will give you the feeling of descending.) Second, slowing down at the *FAS* point will require changing airspeed (from 180 KIAS to final approach airspeed) while maintaining a constant glide path. This requires preparation and is one of the reasons ASLAR weather criteria are 500/1. Three practice approaches (in VMC or simulator) are required in TAC to prepare aircrews for the IMC ASLAR approaches.

Summary

ASLAR is a cooperative effort between aircrews and controllers to achieve the same goals: launch and recovery rates needed to support wartime operational requirements in IFR weather. The procedures have been extensively tested and they work.

The reduced phraseology, speed reduction maneuvers and procedural flight split-ups have redistributed or decreased controller workload so controllers can concentrate on sequencing and separation. Standardization of aircraft speeds, posi-



ASLAR HAS SIGNIFICANTLY INCREASED FIGHTER RECOVERY RATES

tions, and slowdown points allows ATC to safely reduce separation.

TAC has formed a task force helping to implement ASLAR procedures at all active TAC bases within two years. TAC-gained units are also affected because they may find ASLAR procedures in effect at TAC bases as well as several overseas locations they fly to.

ASLAR requires more precision and discipline from all aircrews. Since separation criteria has been significantly reduced, any large deviations in airspeed or ground track will result in a breakout.

Finally, this discussion has probably generated a lot of questions. The answers will be in the ASLAR Aircrew Handbook, Chapter 7 to AFM 51-37 (Draft). This document will be provided to each aircrew during implementation.

Maj Bob Keeney, a graduate in Aerospace Engineering from Texas A&M University, entered the Air Force in 1971. He has 12 years of fighter experience in the A-7D and F-15, including tours at England AFB, LA; Korat AB, Thailand; Langley AFB, VA; Bitburg AB, Germany; and Luke AFB, AZ. He is currently an F-15 Stan/Eval program manager at HQ TAC, and heads the TAC ASLAR task force.

TAC tips INTEREST ITEMS,

Midairs

By Col Gary D. Lape
Chief, TAC Flight Safety

Five years ago, the lead article in the January 1979 *TAC Attack* focused on midair collisions within the fighter community. The article declared that in the previous five-year period (1974-78), TAC and TAC-gained units had lost 10 crewmembers and 17 aircraft in midair collisions. Another 7 aircraft were damaged in these mishaps. Not pleasant history.

Then, in 1979, we didn't have any midairs. What did we do right? Midair Collision Avoidance (MACA) was a special briefing item for each flight; clearing formations were stressed; visual lookout during departure and recovery phases was a high interest item; and the emphasis on formation discipline was at a high level. The threat was well-advertised and we all worked hard to keep from running into each other.

Unfortunately, we've lost something over the last four years (1980-83), because TAC and TAC-gained units have experienced 17 midairs, which destroyed 10 aircraft and killed 10 crewmembers. No major weapon system is exempt—from the smallest fighter to TAC's biggest heavy, both single-seaters and multiholers. We've had midairs on formation takeoffs, on join-ups, on position changes (that's right, position changes), when poking one's nose back into the fight, on formation approaches, and on landing rollout.

How do we stop formation midairs? We improve our formation from top to bottom. The first step is one step to the rear, a back-to-basics approach to formation skills, responsibilities, and discipline. The second is a review of attitudes and formation practices in the unit. Here are a few things to look for: Do you debrief imperfections that you witness in basic formation events (takeoffs, rejoins, landings)? Do you allow sloppy wing work, continual out-of-position tactical, or unbriefed (unpredictable) maneuvering? Do you critique the flight lead who directs a channel change and then goes heads down just as three wingmen are closing for the rejoin? When was the last time you told ATC, "I *can't* change channels right now, I'm maneuvering a formation"? What did you say in the debrief after one of your ACM opponents had blown through your flight, not seeing any of you and commenting, "Well, I *thought* I knew where everyone was when I reentered the fight"? On that formation landing when number 2 started drifting in uncomfortably close, as you started the flare, did you only clench your teeth, knowing in your heart that he wouldn't hit you? The last time Blue Four fouled up a position change, did you stop him and have him start over?

These all sound pretty basic—but that's where the majority of our midairs are occurring. We're

averaging one per quarter doing the basic stuff.

I challenge each of you to sharpen your formation skills. Demand excellence and don't accept less than perfection—from yourself or your wingman. Leaders, be firm, be directive, and demand the proper responses. And the next time you step, don't think "it can't happen to me."

New thunderstorm threat, just what we need

Most of us assume that thunderstorms occur either in frontal or prefrontal squall lines or as somewhat random air mass type storms found on hot summer afternoons. In our idealized view, cells are either scattered here and there during the afternoon, with a lifetime of an hour or two, or organized into narrow, fast moving squall lines sometimes lasting several hours.

Another type of convective system is receiving attention from weather researchers of the National Oceanic and Atmospheric Association. The mesoscale convective complex (MCC) is simply a very large grouping of thunderstorm cells which forms in a circular or elliptical shape, moves very slowly, and persists for twelve to sixteen hours. Within these complexes, surface conditions are typical for thunderstorm activity—heavy rain, gusty surface winds, hail, thunder, and lightning.

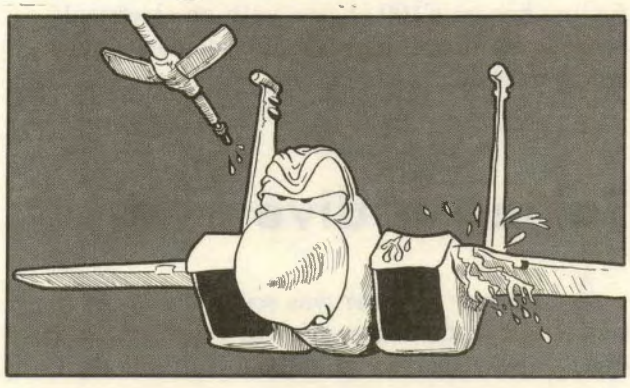
Whereas thunderstorms are thought to pose an intermittent or brief threat to flying operations, MCCs are long-lived and so slow moving that they can affect individual aerodromes for hours. Last summer an MCC produced thunder, lightning, and light-to-moderate rain continuously for more than nine hours at Jackson, Mississippi.

Might be something to grill the weatherman about before declaring an alternate whose forecast includes "intermittent" thunderstorms and rainshowers.

Adapted from *Flight Ops*

Fire during fill-up

Ever wonder about the overspray from the tanker's air refueling nozzle? It's not an everyday occurrence, but we do see it now and again. Most of us don't give it much thought. Perhaps there's reason for some of us to be concerned the next time we notice overspray as each successive wingman is topped off. Here's why.



TAC TIPS

An F-15 pilot had been on the boom about two and a half minutes when all of a sudden he felt a mild explosion and heard that lady's voice as his Master Caution and Left Engine Fire lights came on. The boom operator withdrew the nozzle from the Eagle's air refueling receptacle and told the pilot that a panel had blown off the back left side of his aircraft. The flight lead, on the tanker's wing, confirmed a fire.

The mishap pilot pushed and pulled all the proper switches and handles which shut down the stricken engine and put the fire out. He and his Eagle were able to limp home on the one good engine.

What happened? This was supposed to be an air refueling mission, not practice for the annual qualification emergency procedure evaluation.

This particular KC-135 tanker had been written up for excessive overspray a couple of days in a row. And no wonder it leaked: maintenance workers found a universal in the nozzle tip that only lacked an eighth of a turn from being completely disconnected. That would have been even more exciting.

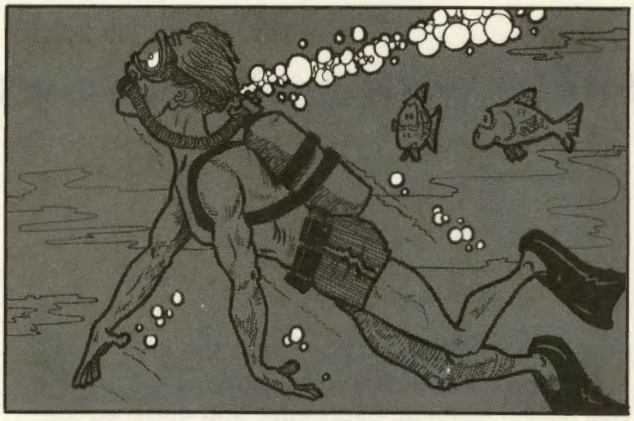
This particular F-15A wasn't running quite at 100 percent either. The wiring harness around part of the left engine had chafed over a period of time from engine/airframe vibration and was arcing. When fuel vapor made its way into the engine bay, the explosion was right behind it.

How did the fuel vapor get in the engine bay? A and B models of the F-15 have the IFR receptacle drain located directly in front of the ram air duct that leads to the engine bay.

Because of the design, excessive overspray *will* drain into the engine bay. Might be a good idea for pilots of these aircraft to decline refueling in flight when they see excessive fuel overspray. Not every A or B model scheduled for air refueling has an F100 engine with an electrical short in its wiring harness. But we don't know which ones do.

Taking a dive

An aircrew member was scuba diving with a couple of friends in the Atlantic Ocean. All three divers were experienced and had suitable equipment for diving in the ocean. But the crew member was using a smaller compressed air tank than his companions. When he noticed his air supply gauge near the danger level, he ascended more rapidly than usual. Sure enough, on the surface he felt signs of the bends. So he strapped



on another air tank, dove down sixty feet, and swam around for a while. It seemed to work because the discomfort went away. He surfaced slowly this time and called it a day.

The next day he returned to the air base and entered the required crew rest period before flying. Even though the dive was two full days ago, his joints began to ache during the preflight. He mentioned it to the aircraft commander, who immediately sent him to the flight surgeon.

The crew member had fully complied with the crew rest requirements. But because of the rapid rise to the surface, he had decompression sickness. Had he flown, the normal 8,000-foot cabin pressure may have killed him. No joke.

AFR 60-16 (and the MAJCOM supplement) specifies a time constraint between scuba diving and flying *when everything goes right.* But the issue isn't the amount of time between diving and flying. The issue here is injury. If a crew member suffers a physiological disorder from diving, the flight surgeon can help get him cured as he did in this case by treating him in a decompression chamber. But first he needs to know about the problem. Even if there's not an injury—just doubt about one's physical capabilities after diving—consult the Doc.

By the way, what happened to the buddy system? Had all three divers surfaced together at a normal rate, the mishap wouldn't have happened. If the crew member had run out of air, buddy-breathing would have helped him make it topside—without the bends.

SAFETY AWARDS

INDIVIDUAL SAFETY AWARD

TSgt Gary L. Porter

TSGT GARY L. PORTER, Unit Safety NCO for the 35th Equipment Maintenance Squadron, 35th Tactical Fighter Wing, George Air Force Base, California, is this month's winner of the Tactical Air Command Individual Safety Award.

Sergeant Porter has significantly improved the safety program for the 35th Equipment Maintenance Squadron. He researched and wrote a briefing on Air Force Occupational Safety and Health that he gives to all newly assigned personnel during their orientation. Since the inception of this briefing, ground mishaps have been reduced by over 20 percent.

Sergeant Porter developed a checklist to insure that all people who drive on the flight line are fully qualified. As a result, the number of government vehicle accidents and moving traffic violations on the flight line has been cut down. He also conducted a survey of squadron motorcycle operators to identify experience levels and training. From this survey Sergeant Porter identified about 50 people who needed more motorcycle training. Because of his vehicle operation knowledge, Sergeant Porter was selected to write the George AFB Supplement to the Special Purpose Vehicle Training Manual (AFM 52-4).

Sergeant Porter is dedicated to raising the safety awareness of the people who work in the 35 EMS. He has earned the Individual Safety Award.

SPECIAL ACHIEVEMENT IN SAFETY AWARD

THE 422d TEST AND EVALUATION SQUADRON, Nellis Air Force Base, Nevada, with its unique mission and excellent safety record, has been selected to receive the Tactical Air Command Special Achievement in Safety Award.

During 1983, the squadron flew in more than 23 operational test and evaluations (OT&E), and tactics development and evaluations (TD&E). These tests included AIM-9M follow-on operational test and evaluations (FOT&E), A-10/AIM-9L compatibility evaluations, GPU-30-mm gun pod lethality evaluations (F-4), and F-15 infrared missile defense TD&E.

As test project officers, squadron members strive to ensure that all new weapons, avionics, or tactics are both effective and safe for release to TAC operational units. When applicable, safety considerations and procedures are developed from lessons learned during tests.

The squadron deployed aircraft to the following locations: F-15s/F-16s to Holloman AFB, New Mexico, for AIM-9M live fire evaluations (12 missiles fired at PQM-102 drones); F-15s/F-16s to Holloman AFB and Point Mugu NAS, California, for Have Glass; F-16s/F-4s to Eglin AFB, Florida, for Model Car II; A-10s to Hill AFB, Utah, for IR Maverick testing; A-10s to Colorado Springs, Colorado, for improved Pave Penny tests, and to Myrtle Beach AFB, South Carolina, to evaluate the gun gas superkit. In addition, the squadron supported two large firepower demonstrations for the American and NATO Chiefs of Staff. Squadron aircrews employed live MK-84s, GBU-10 laser guided bombs, 30-mm HEI, and AIM-9 missiles in time-critical, tactical scenarios. An F-16 flight generated a high accident potential report when the pilot discovered that turning on the ALQ-131 ECM pod caused the aircraft generator to shut down. The unit sent a message which identified recurring AIM-9 fuzing problems encountered during firepower demos. And finally, the squadron received an excellent rating for its safety program during the TAC Management Effectiveness Inspection in November 1983.

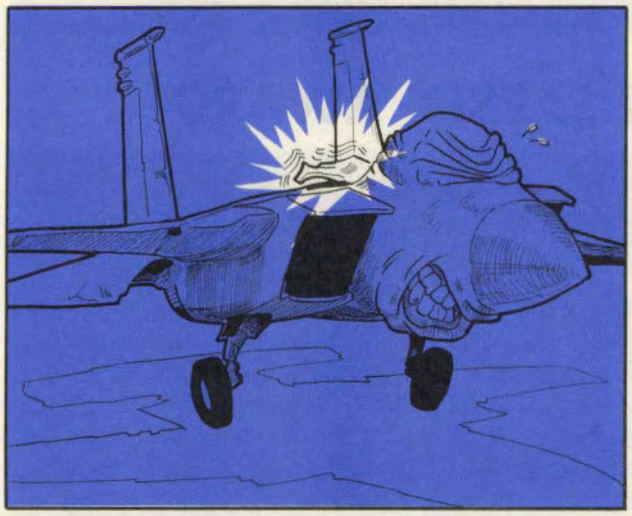
CHOCK TALK

chock talk incidents and INCIDENTS AND

Could have been worse

By Capt. Guy C. Fowl
HQ TAC/LGMF-15

Safety equipment makes maintenance work safer—when it's hooked up correctly. A $48,000 speedbrake was destroyed at one of our units when a jury strut was improperly installed and driven through the speedbrake when a worker



applied hydraulic power to the aircraft. How'd it happen?

Two hydraulic technicians, one a qualified 5-level and the other in training, were repairing a hydraulic leak in the speedbrake well of an F-15. After they tested their work by operating the speedbrake several times, they were ready for a break. Before leaving, the qualified technician lifted the speedbrake and the trainee installed the jury strut—upside down. Apparently neither one knew that TO 1F-15A-1-05-JG-10-1 covers installation of the speedbrake strut. And the condition of the strut didn't help : the arrow labeling the top end of the strut (normally painted on new jury struts) had worn off. Anyway, when the strut was installed, they headed for the dispatch office, planning to apply safety wire later.

When the trainee returned to the Eagle, he found an avionics technician in the cockpit. Without a word to the other worker, the hydraulics trainee climbed atop the aircraft and sat down to install safety wire on several components in the speedbrake well. Unknown to the hydraulic specialist, the avionics technician was about to run an ops check of the flight controls. Sounds like someone is going to get crushed in the flight controls, doesn't it?

The avionics troop applied power to the aircraft from an attached hydraulic power unit before either checking the speedbrake switch's position or seeing that others were clear of the control surfaces. The man in the speedbrake well was startled to hear the speedbrake closing. He immediately got up and ran to the cockpit and told the other worker not to move the flight controls until his safety wiring job was complete.

Several hours later the damaged speedbrake was discovered by the aircraft crew chief.

Lack of training, failure to follow tech data, and the safety equipment's condition contributed to this mishap. While $48,000 is a lot of money to pay for a lesson, it's nothing compared to the cost of an arm, leg, or the life of a worker crushed in the flight controls. As the police sarge on TV used to say, "Hey! Let's be careful out there."

Engine hollers in hush house

Three maintenance workers were checking the health of an F-16's F100 engine inside a noise suppressor unit (hush house). Two of the workers had only run engines on outdoor trim pads, not in a hush house. But an engine run's an engine run, right? Not so fast.

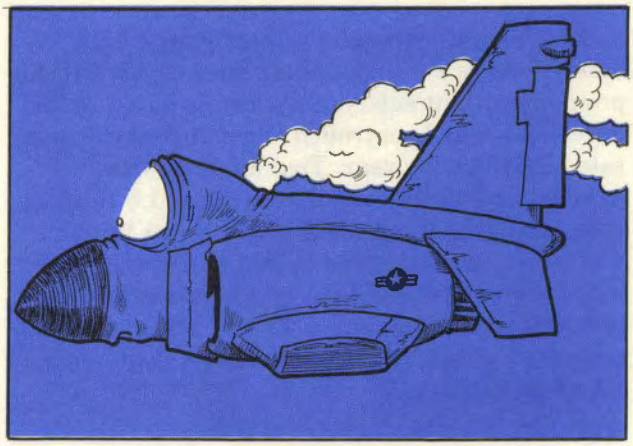
One worker (the operator) was in the F-16's cockpit, another (the ground observer) was on the floor beside the aircraft, and the observer was in the control cab. All the workers were linked together by the aircraft's interphone system. When the worker on the floor with the aircraft hooked up the comm cord, he found it intermittent; so he replaced the cord with a shorter forty-foot communications cord. After the idle power leak checks were completed, the ground observer moved from the right to the left side of the aircraft before the next operation. But he was restricted by the shorter comm cord. So he had to disconnect the cord, pass it under the aircraft behind the nose gear (that is, in front of the intake), walk over to the left side of the aircraft, and then reconnect to the interphone jack. Then he stood over by the fire extinguisher on the left side of the F-16 for the next run.

All three workers confirmed the area was clear, and the operator advanced the throttle. As he did, the observer in the control cab saw the slack in the ground observer's comm cord being sucked up into the engine. He hollered at him to take up the slack, but he didn't understand. The engine ingested the cord and then pulled the cord from it's connection on the ground observer's headset and ate the end of the cord too. Ouch.

Where did that wind come from? A few things about this hush house business are different from the outdoor trim pad. When the aircraft's engine is back at idle, there's not much air flow through the hush house. But when the engine winds up to military or max power, the velocity of wind near the air inlets can reach 46 mph. Two of the workers were unaware of the extra foreign object damage potential created by turbulence during an engine run in a hush house—no one briefed them.

Hot air

An F-4G Wild Weasel was thundering down the runway at about 150 knots, about to rotate and become airborne, when the cockpits began to fill with heat and smoke from along the right side of the aircraft. The pilot knew he'd have a hard time stopping the heavyweight tricycle



right at that moment, so he elected to continue the takeoff and deal with the problem once the aircraft was safely in the air. The crew accomplished the Smoke and Fumes checklist which soon cleared the smoke, but the temperature in the cockpit was still much warmer than usual. So they turned their aircraft back around and landed.

Troubleshooters didn't have to look too far to find the cause. The aircraft forms told the story of a technician who had worked to clear a cabin pressurization problem. All the work he did (and some he didn't do) was neatly recorded. When the troubleshooters pulled panel 6R to have a look at the bleed air pressure regulator that the technician had repaired, they saw that the bleed air line, that the technician had *temporarily* capped off, was still plugged with the cap. The hot air (tapped from the engine's turbine section) that was intended for various components downstream from the pressure regulator in the aircraft's nose, with no outlet, vented overboard within the aircraft's nose section and soon found its way into the cockpit.

Apparently after fixing the pressurization problem, the worker forgot to remove the cap from the bleed air line and to reconnect the line to the regulator. Wonder how the inspector, who signed off the Red X in the forms, also missed it.

The unit now attaches a little red streamer to the caps to remind workers to remove the cap. That's a good idea. But if we don't follow tech data or inspect the job against the tech data in the first place, the right combination of distractions might lead us to overlook the streamers. Then the little red tags may only serve to flag troubleshooters or accident investigators to our incomplete repairs.

TAC COMMANDER'S TROPHY

The TAC Commander's Trophy for Flight Safety honors a numbered air force or ADTAC for promoting flight safety. Selection is based on the lowest command-controlled Class A flight mishap rate in a calendar year. Tied for 1983 were ADTAC and 12 AF with an identical 1.6 mishap rate, including their Air Reserve Force units. The trophy was accepted by Major General Violett, Commander ADTAC, and Lieutenant General Gregory, Commander 12 AF. The award was presented at the TAC Commander's Conference, 17–19 April 1984.

AIRCREW OF DISTINCTION

Capt Peter A. Bonanni
2d Lt John S. Morrison
63 TFTS, 56 TTW
MacDill AFB, FL

On 25 January 1984, *2d Lt John S. Morrison* and his instructor, *Capt Peter A. Bonanni,* were flying a transition mission in a two-seat F-16B. The mission profile included simulated flameout patterns at a nearby municipal airport. The SFO's high key was restricted to only 6,000 feet above the airport because of a 7,000-foot ceiling.

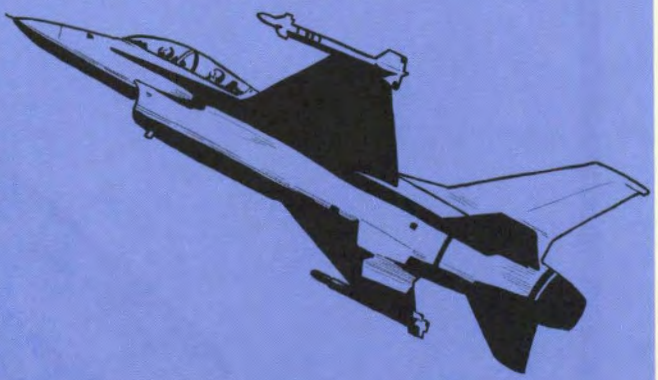
Lt Morrison placed the throttle to idle and configured the Falcon for the approach to the 5,000-foot runway. After rolling out on final approach at 1,000 feet above the ground (AGL), he confirmed the engine's response to throttle changes. At 400 feet AGL, Lt Morrison, who had flown only two previous F-16 missions, selected military power to go-around, but the engine wouldn't accelerate. Capt Bonanni then directed the front seat pilot to go-around, but he couldn't. Despite throttle advances, the rpm was stuck at 80 percent, insufficient thrust to maintain altitude or airspeed.

Passing mid-field (too far down the runway to attempt a landing), Capt Bonanni took control of the aircraft and told Lt Morrison to turn the EEC/BUC switch OFF (to eliminate any electrical engine control malfunctions). This had no effect. Passing the departure end of the runway at 300 feet AGL, the pilot raised the now-useless landing gear. As the airspeed decayed to 155 knots, the IP directed the pilot to select afterburner. But the AB wouldn't light.

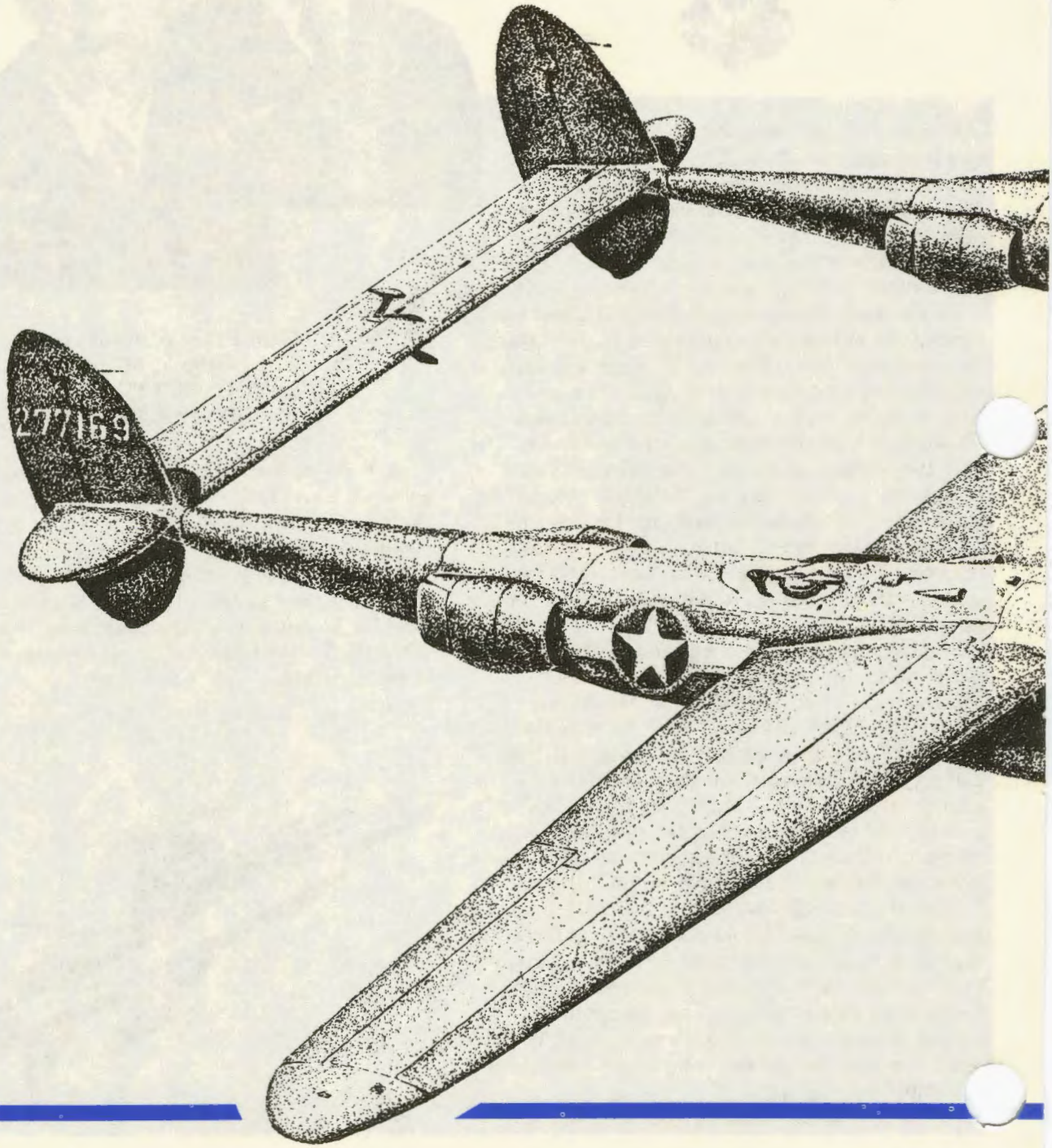
With the aircraft now at 200 feet AGL and 142 knots, the IP told the pilot to pull the throttle to mid-range, turn the EEC/BUC switch to BUC (back-up fuel control), and prepare for ejection. As a final gesture, Capt Bonanni advanced the throttle—with the engine in BUC, acceleration was immediate, and the aircraft began a climb.

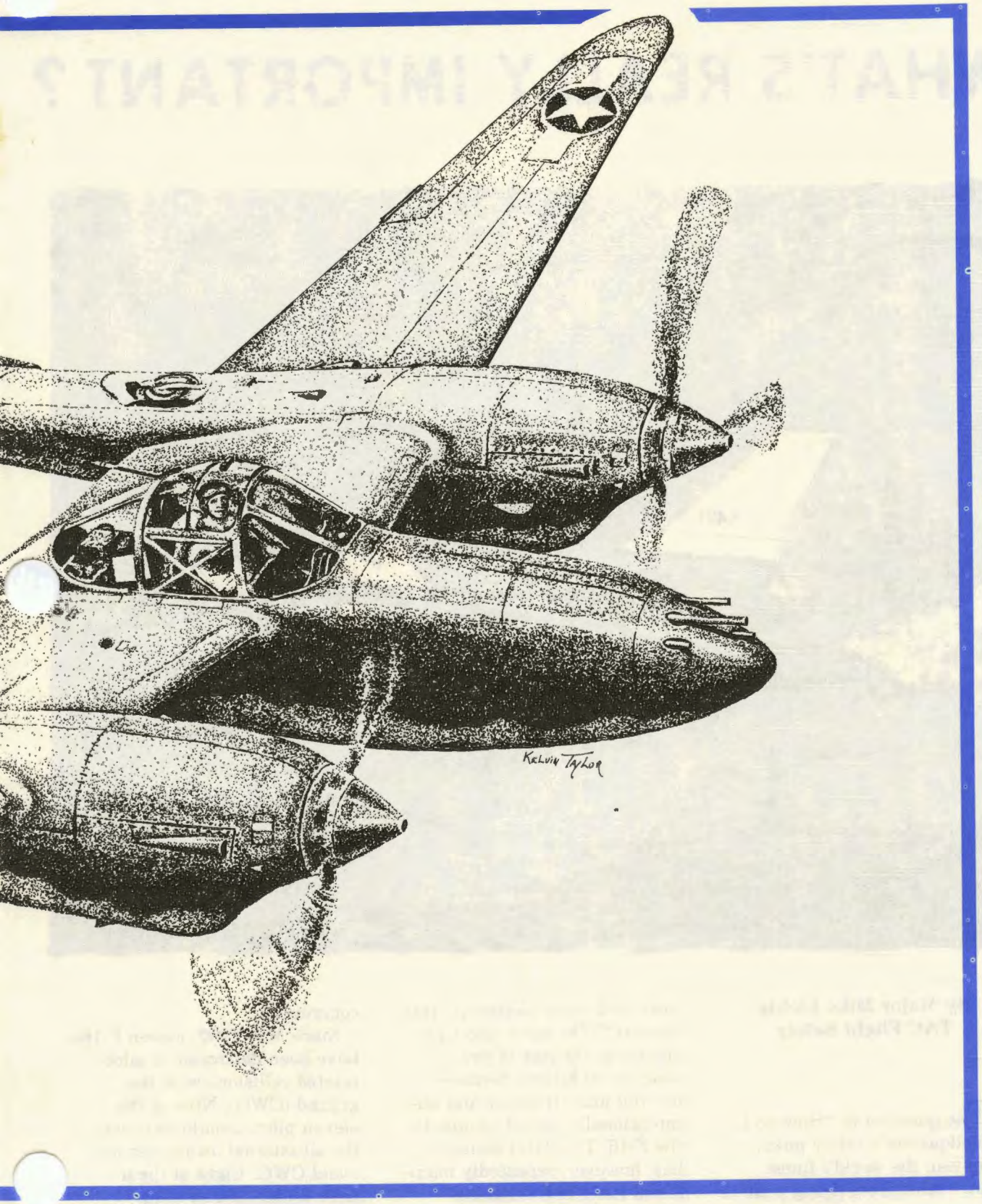
By the time the aircraft climbed to a safe altitude, they were almost as close to their home base (with an 11,000-foot runway and cables) as the muni at their six o'clock. They landed from a straight-in approach.

By their timely reactions, excellent systems knowledge, and skillful flying, Lt Morrison and Captain Bonanni saved their airplane. They deserve the Tactical Air Command Aircrew of Distinction Award.



P-38 LIGHTNING




KELVIN TAYLOR

WHAT'S REALLY IMPORTANT?

By Major Mike Lichty
TAC Flight Safety

The question is, "How do I, a headquarter's safety puke, keep you, the world's finest fighter pilot, from flying your sleek and racey electric jet into the dirt?" The same question applies to the rest of you steely-eyed killers, because moving mud (literally and unintentionally) is not unique to the F-16. This fatal scenario has, however, repeatedly manifested itself in the Falcon community.

Since May 1982, eleven F-16s have been destroyed in pilot-related collisions with the ground (CWG). Nine of the eleven pilots should have had the situational awareness to avoid CWG. Eight of them were killed, and most at-

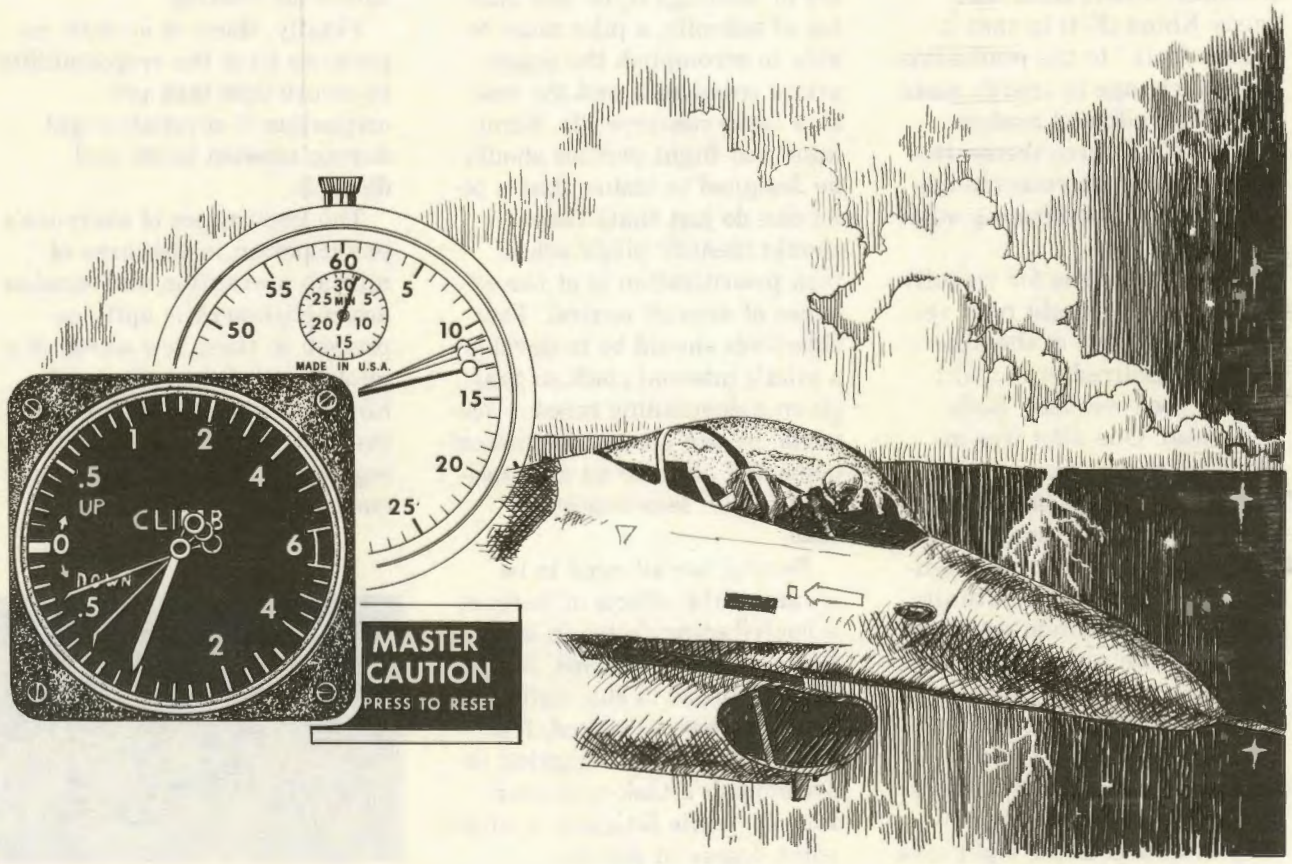
tempted neither recovery nor ejection. We think the remaining two pilots were incapacitated by G-induced loss of consciousness (LOC). I will not address the LOC issue here, but will discuss the elements that contributed to nine good F-16s impacting the ground in controlled flight.

While each mishap scenario was different, one element was common to them all—a deficiency in task prioritization. For whatever reason, the pilots neglected the primary requirement to *monitor the flight path vector* of the aircraft and focused their attention on a less-critical, secondary mission task.

Let's briefly review these scenarios. Two of the mishaps involved night sorties with no discernible horizon, flown over areas with little if any ground lighting. In both instances the pilots didn't adjust their sleeping habits to accommodate a night flying schedule. One mission involved a penetration before entering the range, and the other involved post-attack vectors following the conversion turn of a medium altitude intercept. We suspect that both pilots went for over one minute without monitoring their aircraft's flight path vector and descended some 8,000 feet to ground impact.

In another night range mishap, a pilot attempting to visually rejoin on lead was distracted by a caution light inside the cockpit and intermittent IMC outside. He also went for over a minute without monitoring his aircraft's attitude. The result: an unusual attitude close to the ground where recovery was impossible.

A low-level weather abort produced another F-16 fatality when a wingman lost visual and radar contact on flight lead. While in the weather, he engaged the autopilot and tried to re-establish the lead element's position. An insidious descent developed and persisted for almost a minute before ground impact. The pilot's fatal error was in not monitoring performance instruments to confirm autopilot operation.



WHAT'S REALLY IMPORTANT?

So what have we learned that will prevent similar mishaps in the future? This history seems to tell us that no matter what the mission, when at night or in the weather, if the time between instrument crosschecks exceeds one minute, the aircraft's flight path vector may be far removed from what the pilot perceives—sometimes enough so to be fatal. Because of the *F-16's* cockpit and avionics design, *sensory cues alone are not sufficient to maintain aircraft control at night or in IMC*. The F-16 (and some other modern fighters whose stick forces remain the same despite changes in airspeed and angle of attack) differs from the trusty Rhino (F-4) in that it doesn't "talk" to the pilot advising of a change in energy state. Therefore, pilots of modern fighters must force themselves to crosscheck instruments frequently while performing other mission tasks.

The same is true for visually monitoring the flight path vector in VMC. Two of the nine mishaps occurred at low altitude in good weather. Both were fatal. One pilot was attempting to resolve a navigation error (most probably heads down), and the other was concentrating his visual attention on a target of opportunity during a low-altitude intercept mission. Both aircraft impacted rising terrain that their pilots saw too late to avoid.

So, what's a pilot to do? First, recognize that in today's multirole fighter, giving priority attention to the right task at the right time is the key to basic survival as well as successful mission accomplishment (so what's changed?). The *first* priority is to maintain aircraft control and an *awareness of where the aircraft is going*. The flight conditions (day/night/IMC/VMC) will dictate whether a visual, instrument, or combined crosscheck is required. The mission profile will determine the maximum time allowable for executing mission tasks in between crosschecks to prevent collision with the ground.

In modern fighters it is not sufficient to just fly good instruments. To insure the number of landings equal the number of takeoffs, a pilot must be able to accomplish the appropriate crosscheck and the mission tasks *concurrently*. Simulator and flight profiles should be designed to insure that a pilot can do just that. They should identify pilots whose task prioritization is at the expense of aircraft control. The objectives should be to develop a pilot's internal clock so that, given a demanding mission scenario, he can choose the critical tasks and allocate an appropriate time for less-important ones.

Second, we all need to be aware of the affects of fatigue, a contributing factor in a majority of these mishaps. A pilot is more prone to channelize attention when he's tired. It's easy to see that attempting to accomplish a task-saturated mission while fatigued or under some degree of psychophysiological stress is just asking for trouble. History shows us that flying when fatigued, which produces fatal errors of omission or commission, is not limited to inexperienced pilots. Supervisors with stars and wreaths over their wings have contributed their fair share to fatal CWG statistics. With the increased demands on their time, they are perhaps even more susceptible. We all need to be aware of the symptoms and effects of stress and fatigue and to review them before and during such unit commitments as night flying, surges, and deployments. Additionally, recognizing and identifying the wingman or flight lead who is demonstrating signs of stress or fatique may be critical to insuring he's present at the next squadron meeting.

Finally, those of us with experience have the responsibility to insure that task prioritization is covered/taught during mission briefs and debriefs.

The importance of everyone's participation in this area of mishap prevention and mission accomplishment is aptly expressed in these few words: If a pilot is killed, he takes with him examples and advice from everyone who touched his flying career. *You* may only get *one* chance.

TAC recently distributed the videotape recording *How Low Can You Go*, by Capt Milt Miller, 162 TFG (ANG). This VTR (#601930) thoroughly reviews prioritization of tasks during low altitude flight.

Video Display Terminals (VDTs). The American Optometric Association has compiled some guidelines to help avoid headaches, eyestrain, and fatigue—by-products of using VDTs. Use an adjustable chair. Sit 14 to 20 inches from the screen, looking down to the center of the screen at an angle of about 20 degrees (if you have a double chin, don't use a VDT). Place reference material as close to the screen as possible. The screen and reference material should be the same distance from your eyes, so your eyes won't have to move and refocus as much. Take frequent breaks—at least 15 minutes every 2 hours. Have your eyes examined regularly. Using a VDT can aggravate an existing eye condition, so be sure to tell your eye doctor that you use a VDT.

I Think I Sprained Something. Apply cold first (immediately), then 12 to 24 hours later, apply heat. That's a good rule for treating sprains, strains, and other injuries. Cold (cold water, ice pack, wet towel) relieves pain, minimizes swelling, relaxes muscles, and reduces spasm. Heat helps relieve pain and spasm, and aids in repair by increasing blood flow to the injury. If used immediately, though, heat can increase inflammation and may cause bleeding from injured blood vessels.

Believe It or Not. * The safest place to live in the United States is New Jersey and the second safest place to live is New York (based on accidental deaths per 100,000 population). * About two people die in home accidents every hour, and someone is injured in a home accident every 10 seconds. * Accidents are the fourth leading causes of death, and the three leading causes of accidents are motor vehicle crashes, falls, and drownings. * The most often reported vehicle defect is worn or smooth tires. * The safest time to drive is a Monday or Tuesday in January. The worst time is a Saturday in July.

What's New in Tornado Safety. The National Weather Service says not to waste time opening a window to equalize pressure. Most homes and buildings have enough natural ventilation to compensate for the rapid pressure changes in a tornado. And if you were ever told to go to the southwest corner of a basement or building, forget it. Research shows that one corner is as good as the next. If a tornado does strike, seek shelter in a basement or the center of the building in a closet or bathroom on the lowest floor.

COPD. According to the Mar 84 issue of *Your Health and Fitness* magazine, Chronic Obstructive Pulmonary Disease (COPD) is the sixth leading killer in the United States today. COPD is a general term used primarily to describe chronic bronchitis and emphysema. The majority of cases of COPD are caused by cigarette smoking—91 percent of the sufferers are (or were) heavy smokers. And tests in England show that 26 percent of heavy smokers will develop COPD; moderate smokers (less than a pack a day) have a 15 percent chance. If you're ready to quit smoking, studies show that people who go "cold turkey" are more successful than those who use pills or take lessons.

How to Spot a DUI Driver. Don't be in the wrong place at the wrong time. If you can spot a DUI driver, you can avoid one. A DUI driver might—

* Turn corners wider than necessary or make illegal or sudden turns without signaling.
* Straddle the center line, weave, swerve, or drift from lane to lane.
* Come close to hitting something, drive on the shoulder of a road, go slower than the speed limit, follow too closely, brake erratically, respond slowly to traffic signals, speed up or slow down quickly, stop for no apparent reason, or drive after dark without headlights.
* Look or act intoxicated. The person could be drinking in the car, gesturing wildly or obscenely, driving with head out of side window or with face too close to the windshield.

DOWN TO EARTH

Sodium free

By Col Rich Pilmer, PhD, USAF (BSC)
Air Rescue and Recovery Service
Scott AFB, Illinois

If you had been a member of the ground-pounding Roman military, your pay at the end of the month would have been counted out in coins and a small bag of table salt or sodium chloride (NaCl). Salt was considered such a necessary item for the health of soldiers, it was part of their pay rations. The English word, salary, was derived from this Roman practice. Many of us still frequently refer to our place of work as *the salt mine.*

In recent times, because of the relationship of excessive sodium intake to hypertension, obesity, and heart problems, the restriction of sodium in foods and medications has become increasingly popular. More and more products are being advertised as "sodium-free." At the supermarket, it has become difficult to find plain old iodized table salt—there are now so many flavors and colors of salts with low or no sodium.

With most significant health questions, moderation is the key to success. And it is the same with sodium chloride. Most people can safely cut down on sodium intake and it will benefit their health and well-being. But salt should never be completely eliminated from their diet.

So what's the answer? Do you use salt or not? The desirable position lies somewhere between excess sodium consumption (as may perhaps be found in cases of nondiscriminate fast food fanciers and those who view the can opener as the only means to meal preparation) and in complete sodium elimination (as perhaps exemplified by organic grow-everything-yourself fanatics). As usual, there is a middle ground.

When a healthy person increases the intake of salt, urine sodium excretion increases progressively, reaching, in three to four days, a steady-state level equal to and offsetting intake. During the interval of adjustment, positive sodium balance occurs with an accompanying retention of water and consequent gain in body weight. When salt intake is suddenly reduced, the opposite effects are observed. Sodium excretion decreases, reaching a level equal to intake within three to five days with a reduction in total body water and body weight.

With hot weather coming, it's wise to anticipate a slight increase in salt consumption as an aid to body water retention to offset sweating. If you compensate by slightly dropping your total caloric intake, weight gain should present no problem.

Oversubstitution of potassium salts (sold as a salt substitute) in lieu of sodium chloride can lead to excessive amounts of potassium inside cells. Normally, potassium is low in the extracellular environment with sodium relatively high. Too much potassium intake, as a result of excessive use of foods high in potassium or total elimination of foods containing sodium (because of food restriction, or overzealous weight loss practices), can lead to too much intracellular potassium with a possible effect of arrhythmias and weakening of the heart muscle.

While it is fine to cut caloric intake and use a variety of salts, the important thing to remember is the continual need for some sodium chloride.

Depending on weight, temperature, humidity,

and a number of other factors, a fighter pilot needs from 600 to 3,500 mg per day (2,400 mg is about one teaspoon full).

Your craving for water and salt are all nicely taken care of by homeostatic reflexes controlled by the mid-brain. Just as animals living in areas far removed from the seashore actively search out *salt licks*, humans normally balance their salt needs without much thought.

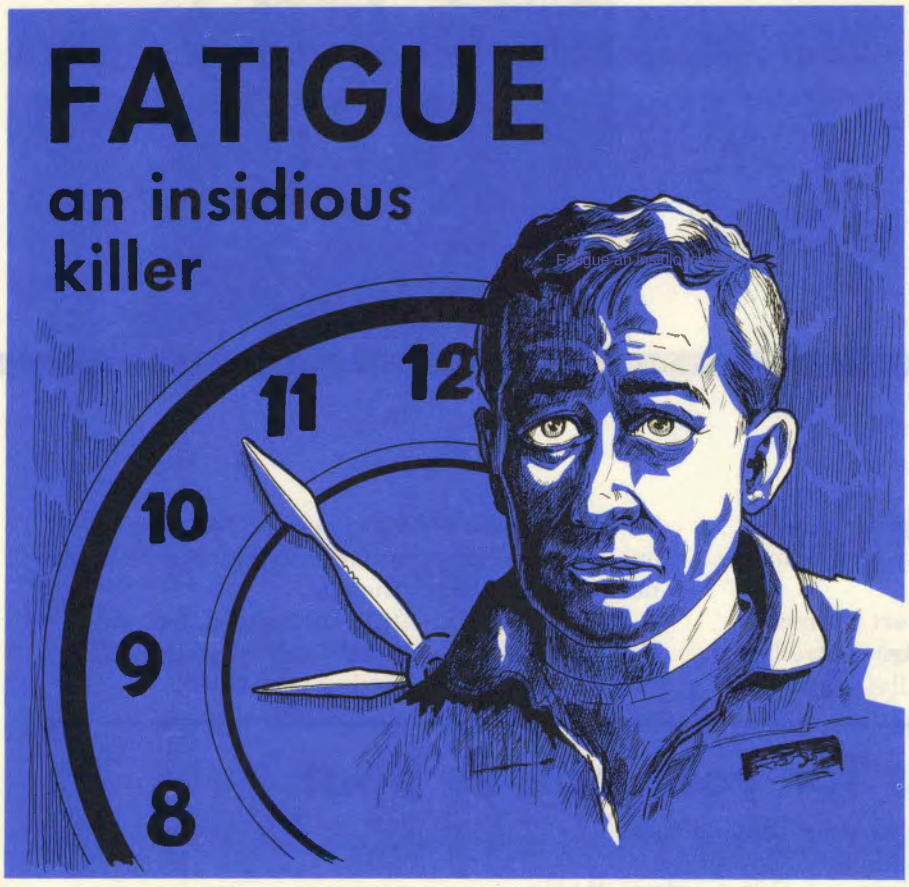
Moderate use of salt is encouraged, but don't try to completely eliminate it from your diet.

Now, get back to earning your salt!

Generic checklist for your power boat

Engine will not start	Engine stops	Engine runs roughly or vibrates abnormally	Engine does not attain top speed at full throttle	Engine Overheats	Problems
■					Master switch not on, battery discharged, broken electric cables, main fuse out of function, burnt ignition contact points, moisture in distributor and ignition cables
■	■				Fuel tank empty, fuel cock closed, automatic choke defective
■	■	■			Water or impurities in fuel, fuel filter blocked
■	■	■	■		Faulty spark plugs
	■	■			Idling speed faultily adjusted
			■		Defective revolution counter, boat abnormally loaded, marine growth and fouling on boat bottom and outboard drive
		■			Propeller damaged
				■	Blocked cooling water intake, cooling jackets, defective pump impeller or thermostat

FATIGUE
an insidious killer



By Dr. Sue Tilton, Maj, USAF
HQ TAC/SG

Early start, early brief, cutting and pasting maps, flying, debriefing, additional duties, briefing, flying, debriefing, additional duties, studying tactics—are you working yourself to death? You might be.

Fatigue is an insidious killer of aircrew members because it may be manifest as spatial disorientation, bad judgment, distraction, or channelized attention. Fatigue describes a state of *diminished efficiency* that usually results from prolonged *physical activity* or *lack of sleep.* Everyone is familiar with it, yet no one is able to measure it, let alone accurately determine the amount of fatigue which seriously impairs job performance.

Over the last five years, fatigue has been increasingly identified as a cause in aircraft mishaps. In 1983, fatigue was a cause in about eight percent of air force Class A mishaps. TAC (and TAC-gained units) had 37 Class A mishaps during 1983; fatigue was causal in two, for 5.4 percent. These statistics do not tell the complete story, however, because they ignore those mishaps where fatigue was suspected to have been only a *contributing factor,* not causal.

Some physiological changes caused by fatigue can seriously affect aircrew performance: these include increased reaction time, impaired memory, decreased coordination, and a greater frequency of errors. These can be easily demonstrated in a *laboratory,* but there is no quick, easy, reliable method *in the field* to identify the early stages of fatigue. If such a test were available, you can bet there would be a machine in every squadron.

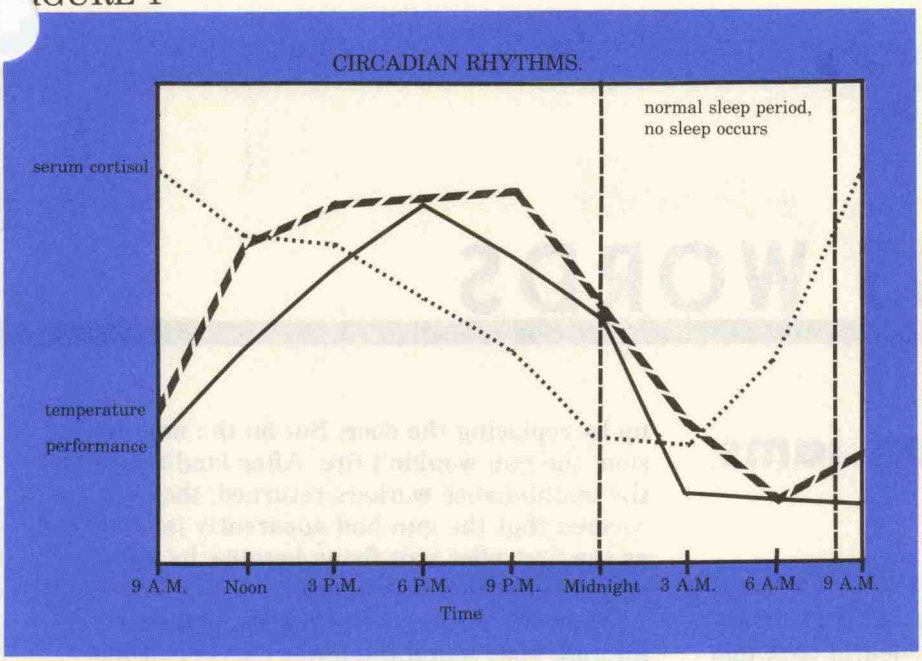
Some missions are more demanding than others, and a tired pilot may perform worse on one type mission than another. Increasing the complexity or difficulty of a task, or the speed at which it must be done, will increase the chances of flawed performance. Newly acquired skills are more susceptible, as is any task requiring memorization and recall. Performance while fatigued varies according to interest and motivation. Physiologically, this correlates with the amount of adrenaline released into the bloodstream. So an unexciting mission is more likely to be affected adversely when something unusual occurs.

There are three basic causes of fatigue in aircrew members:

Sleep loss. Even partial loss of sleep may be significant. Since individuals' sleep requirements are extremely variable, your flight surgeon can't give one figure that will apply to everyone. Research results are contradictory. One test showed decreased efficiency the morning after the normal sleep period was reduced from eight to five hours. Another showed no ill effects when the subjects had four consecutive nights of only four hours sleep. Sleep deprivation adversely affects performance, but there is no reliable method to measure how much sleep must be missed before performance is degraded.

The "eight hours of uninterrupted rest per night" crew

FIGURE 1



rest requirement is a good guideline for most flyers.

Circadian rhythm. The amount of sleep may have less effect on performance than where in the usual sleep-wake cycle a task is performed. If a pilot rises three hours earlier than usual, his difficulty "getting into gear" could be more a result of the early hour than the amount of missed sleep. This is the circadian effect, and it can cause an individual to adapt very poorly to a schedule change.

Figure 1 plots the cyclic nature of three physiologic parameters of an individual who normally sleeps from midnight until 8 o'clock.

Serum cortisol is a hormone related to waking up, and in this individual it peaks around 8 or 9 in the morning. His performance normally peaks in late afternoon and dips between 2 and 6 in the morning.

With no change in his sleep cycle, if this pilot flies a 2-hour sortie at 1 in the morning, the critical landing phase will occur right at the bottom of his performance curve. He might feel great at takeoff and physically drained 2 hours later.

Work-induced fatigue. Even with adequate sleep and fixed duty schedule, aircrews may experience fatigue during demanding missions (low altitude and air combat maneuvering are especially tiring), extended sorties, or surge exercises. Several environmental factors (see Figure 2) common to tactical fighter operations can increase fatigue even with adequate crew rest.

FIGURE 2.

FACTORS CAUSING WORKINDUCED FATIGUE.

Excessive environmental temperature or humidity
IFR conditions
Poor Quality of communications
High workload
Vibration and noise
Poor accessibility or visibility of cockpit instruments and controls

The Prescription:

- Set a goal of getting at least *your* usual amount of sleep before a mission. Avoid the trap of shorting yourself on sleep "just this one time."
- Try to avoid shifting your sleep schedule by more than one or two hours a day when flying late-night or early-morning missions. If Monday starts a week of 3 A.M. reports, try to get up earlier than usual on the preceeding Saturday and Sunday.
- Family cooperation is crucial in planning activities and meals during periods of night flying.
- Eat a high protein meal early in the duty day to help combat fatigue.
- Exercise daily. It helps fight fatigue and also resynchronizes circadian cycles when performed early in the duty day.
- Avoid excessive alcohol and caffeine; they both depress sleep and increase the difficulty in adapting to schedule changes.
- Learn to recognize fatigue in yourself and others. It can be an insidious killer.

We all want to be winners. But if we don't use these common-sense methods to avoid fatigue, we may not be around to enjoy the rewards. ➢

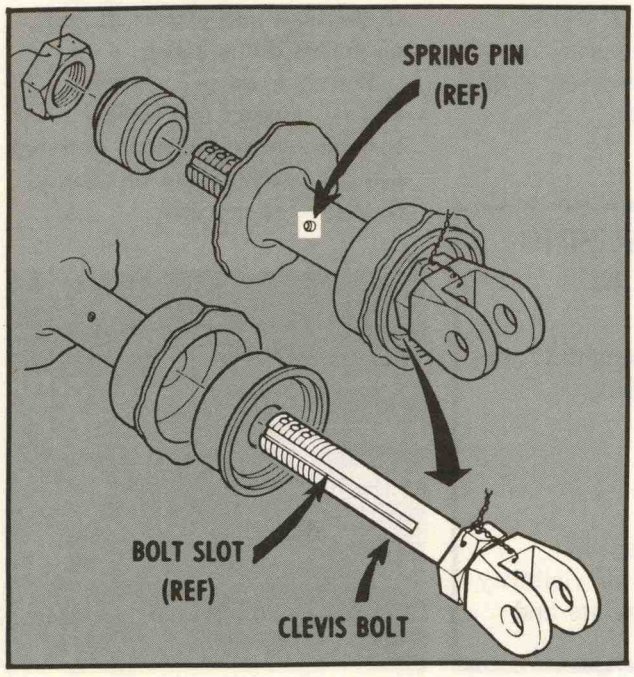
Maj Tilton graduated from Mount Holyoke College in 1972, received her M.D. degree from Baylor College of Medicine in 1975, and her M.P.H. from the University of Texas in 1981. She is board-certified in the specialty of Aerospace Medicine. Before joining the Air Force, she was a flight surgeon at NASA/Johnson Space Center. Maj Tilton was assigned at Nellis AFB, NV, before arriving at Langley AFB, VA, in Sep 83, where she is Chief, Aeromed Requirements.

WEAPONS WORDS

Unexplained gun jams explained

When an F-16 pilot turned his Falcon off the runway and onto the taxiway, the dearm crew told him that the gun access door was unlatched. The pilot thought that was strange because he hadn't experienced any problems with the gun and because the flight lead had looked his aircraft over without comment during the bomb check after the range work. After he'd taxied back to the ramp and shut down, the pilot hopped out and looked at the door himself. He could push it flush with the fuselage, but the door had about an eighth-inch play. So he wrote up the loose access door in the AFTO 781.

Maintenance workers cleared the pilot's write-up by replacing the door. But on the next mission, the gun wouldn't fire. After landing, when the maintenance workers returned, they discovered that the gun had apparently jammed just as the first pilot quit firing because he didn't suspect anything was amiss.



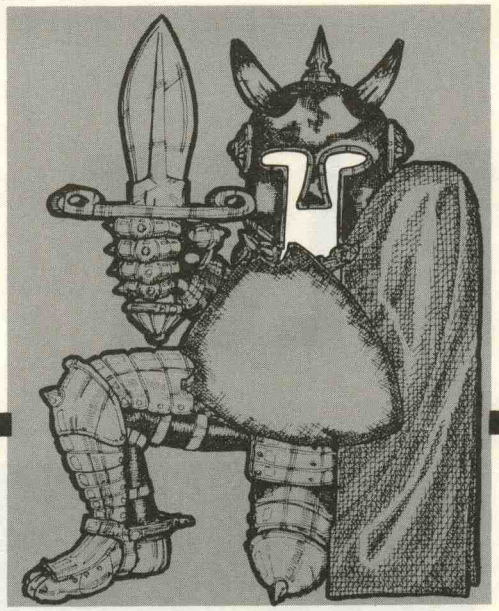
When the workers removed the gun from the aircraft, they found the lower Clevis bolt had about a half-inch horizontal play and the spring pin (that's supposed to keep the Clevis bolt from rotating in the bracket that adjusts the gun's elevation) was broken. It looked like the gun may have jammed because it wasn't held securely in place.

Then another Falcon came back with a jammed gun. When workers removed the gun from the aircraft, guess what they found—its lower Clevis bolt was also loose because its spring pin had been sheared.

During a random check of six other F-16s on the ramp, five bolts with excessive horizontal movement and four bent or broken spring pins showed up. Excessive vibration of the gun and its ammunition during the feeding and chambering processes may have contributed to previously unexplained gun jams.

Keeping count

During a weapons training class at a small arms range, one of the M-16 rifles that had been adapted to fire .22 caliber ammunition kept jamming. The fourth time it jammed, the instructor took the weapon and directed all the students back behind the firing line while he worked on the rifle. He removed the magazine and saw one round in the chamber and a spent case also caught in the chamber. As he tried to dislodge



the brass, the round went off. Shavings from the shell casing flew out through the magazine well and cut the instructor's hand.

The adapter that allows the cheaper .22 bullets to be fired from M-16 rifles is a replacement item; it's supposed to be changed after 28,000 rounds are fired. This weapon had fired 52,917 times, and the range personnel were unaware of the tech order requirement to replace it. With that combination, it's fortunate that all the rifles weren't having problems.

They work better with wings

During the past few months, several tactical aircraft have returned from missions without the bottom control wing on one of their captive AIM-7 Sparrow missiles. The problem seems to be the attaching hardware—although the wings indicate that they are locked, in fact they aren't.

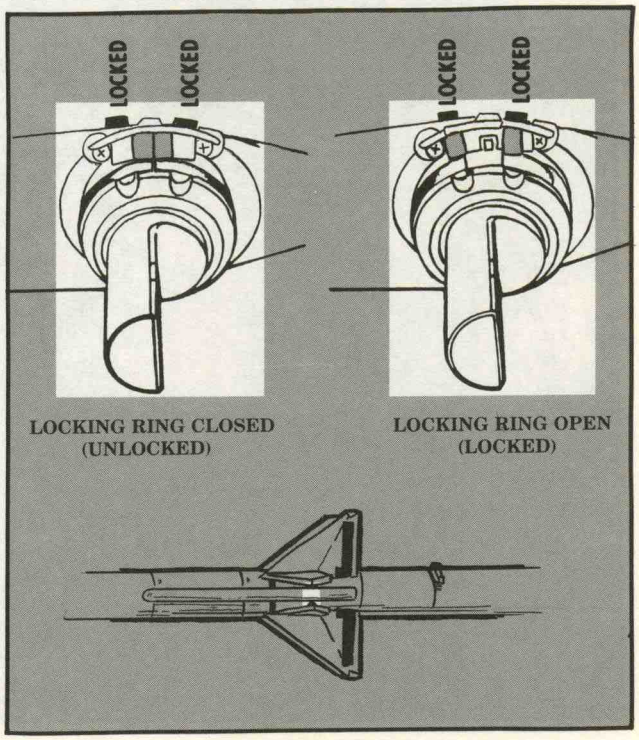
Even though load crews and pilots check to make sure the lock ring tangs are pointing to the *LOCKED* position, and even though they tug and pull on the wings before flight, the wings still occasionally separate from the missile during flight. Sometimes when they depart, they bounce along the bottom of the aircraft, ripping the skin as they go. Frustrating.

The contractor is evaluating an engineering change proposal to improve the reliability of the attaching hardware, but it may be a while before we see the fix in the field. In the meantime, here are three quick checks that may help insure the bottom control wings' security:

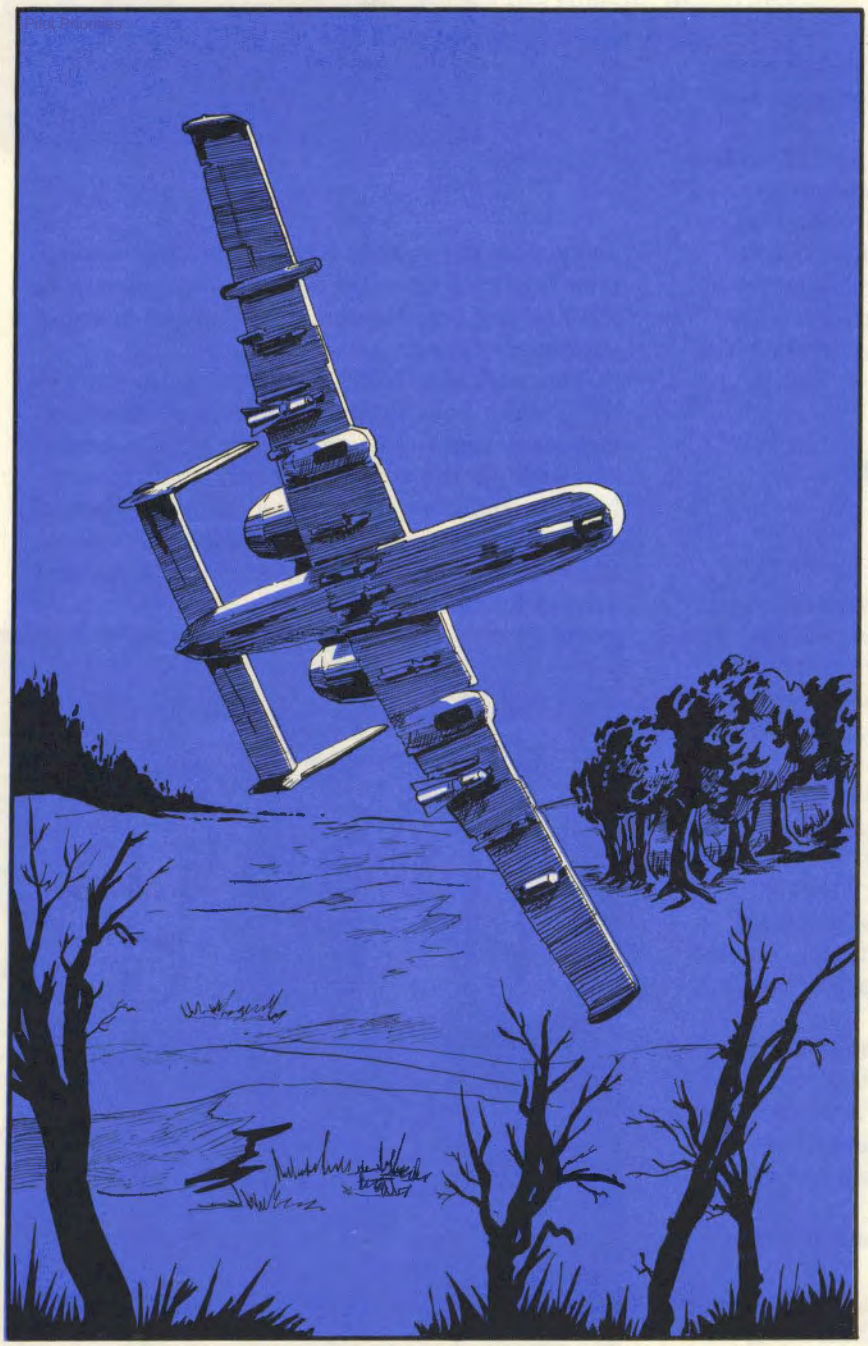
1) The tangs (colored in diagram) of the locking rings must indicate locked.

2) A locked control wing should not give when anyone momentarily pulls firmly downward, away from the missile body. Make sure the pull is in line with the wing's shaft, not cocked. Side force in any direction may preclude discovering an insecure wing.

3) The worker who initially installs the control wing is the key player. We can all observe the lock rings and tug on the wings; but the person who installs the wing is the only one who can hear an audible *CLICK* when the wing's bearing shaft properly seats in the missile's inner race. Without the click, the wing may not be staying around for the next sortie.



PILOT PRIORITIES



by Lt Col Mike Boscia,
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Davis-Monthan AFB,
Arizona

In an effort to enlighten pilots and prevent accidents, numerous articles and studies have been aimed at "high threat" subjects like low altitude flying and air-to-air engagements. Many of the articles contain graphs and charts. With extreme accuracy they disect, integrate, and manipulate units of angle of attack, centers of gravity, cosines of bank angles, density altitudes, and velocity vectors to depict what will or should happen in a given instance. We learned many of these details in pilot training. Some we've stored and never used; some we've forgotten. These flying facts are pertinent, and the articles are helpful because they remind or re-educate us about things we ought to know.

But sometimes we give too much emphasis to detailed studies with charts and graphs and not enough to basic concepts like division of attention and correct priorities. While studies increase knowledge and awareness, common sense and experience are the critical elements in forming cockpit priorities. Instructor pilots use their experience helping stu-

dents learn to order their cockpit priorities in various flight phases; these efforts give young pilots a good chance at longevity and lots of flying time. But sorting priorities can't stop there. We each need to use our common sense to identify the critical tasks in each event before we fly. Here are a few examples of what I'm talking about:

A. When a fighter pilot hits the ground while copying instructions, he has chosen the FAC info above suvival. How critical are FAC instructions when you are holding in the weeds? Certainly not as critical as aircraft control and ground avoidance. He did it unintentionally and only momentarily, but his choice of where to channel his attention was wrong.

B. When a pilot ran into the rocks at night while punching new information into his navigation computer, for a moment he designated those target coordinates as supremely important. Was the lengthy distraction important enough to risk death? Wasn't aircraft control more important? Gary Goebel's comments (*TAC Attack*, Oct '83) on distraction times are certainly valid; complex tasks do lengthen distraction times. However, divided attention and misplaced priorities killed our friend.

C. How 'bout the guy who's been beaten about the head and shoulders about care of the Maverick missile's sun shutter and gyros. Woe to the pilot who pulls off a target into the sun or maneuvers hard before launching/deselecting/recaging his Maverick after a high threat pop-up attack. The heck with the Maverick! When I've recovered from the pass and I'm wings level, *then* I'll worry about the Maverick. I'm certainly not going to bury my head in the cockpit looking for switches while in a descent or high-G turn close to the ground.

D. When a fighter pilot hit the ground during a break turn at low altitude, he just voted avoiding a gun-kill as more critical than avoiding the ground. Yes, he knew the charts say to increase G as bank angle increases. But while looking back over his shoulder at the simulated MiG maybe he didn't have a good idea of his bank angle. His problem was poor division of attention between where his airplane was heading and keeping tally on the adversary.

The common thread in all these examples is that in the heat of battle the man behind the windscreen momentarily mixed up his priorities. And that's where it'll happen to us—unless we plan now. Chances are if I gave you a quiz on the critical task in each of these examples, you'd pass with flying colors. That's not enough. The light bulb has to come on in the midst of the event. You can make it happen—by mentally preparing yourself now.

Priorities—pass 'em on!

Lt Col Michael J. Boscia graduated from Iona College in 1964 with a Bachelor of Arts degree. His first operational pilot assignment was the 9th Air Commando Squadron at DaNang AB, RVN, where he amassed 950 hours of combat time. Since then, he has logged more than 6,000 hours flying time in the T/AT-28, A-7, and A-10. Colonel Boscia arrived at Davis-Monthan AFB, AZ, in March 1978 and has been the A-7 Stan/Eval pilot, the Operations Officer of the 358 TFTS, and the Chief of Wing Stan/Eval. He is now the 358 TFTS Commander and flies the A-10.

LETTERS

Dear Editor

Very briefly, I would like to congratulate *TAC Attack* and Captain Bob Patch on the March 1984 cover article, "To Skid Or Not To Skid."

The style cleverly leads the reader into and through the material (I won't say how many I got right or wrong), presents just the right depth of engineering explanation, and is operationally oriented. The article should become part of the "corporate memory" read file of every F-15 squadron.

Very truly,
Pat Henry
Director, Flight Operations
McDonnell Aircraft Company

Dear Mr. Henry

Thanks for the kind words. Our hat's off to Capt Patch. We believe the information needs to come out of the read file and be recorded for posterity in the flight manual. TAC/DOV is evaluating the suggestion.

Ed

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Dear Editor

The February 1984 issue of *TAC Attack* just arrived and I was pleased to see a "Thud" on the cover. After reading the entire issue I was absolutely flabbergasted that there was only two sentences about the great warbird. To publish a magazine about tactical fighter operation and not include a story on this great tactical fighter at this most appropriate time is an insult to the men and women who were ever associated with it. Your feature, "*TAC Attack* Survey Results," surely was not more important. (P.S. Strong letter to follow!)

Terry E. Paasch, Maj, USAFR
Deputy Commander for Maintenance
419 TFW (AFRES)
(Former Thud Driver)

Dear Maj Paasch

We agree with you—the Thud was a great warbird that superbly served its pilots and country. And its retirement rightly received considerable coverage in other media. Our tribute to the retirements of the F-104 Starfighter (Apr 83) and the F-101 Voodoo (Aug 82) was likewise limited to cover artwork. Our policy isn't meant to insult anyone, but to leave room for current topics and timeless lessons that are applicable to our young troops as well as former Thud drivers.

Ed

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Editor

I read with interest Lt Col Pritchard's article in the Feb 84 issue, "Taking Your First Cable." Although at first highly amused (I take cables for a living), in retrospect, the first one *is* something of an eye opener. Lt Col Pritchard hit the nail on the head—any evolution can't be too terrible if you thoroughly preplan, use the checklist, and fly the numbers. Then, when you're ready for a *real* thrill, call your detailer (MPC) and ask for a tour with us. You'll never sweat "taking the cable" again.

We enjoy your fine publication, sharing as we do many areas of common interest. Keep it up!

LCDR T.F. Glover
VA-75, USS J.F. Kennedy
Off the coast of Lebanon

TAC TALLY

TAC tally

	TAC			ANG			AFR		
	MAR	THRU MAR		MAR	THRU MAR		MAR	THRU MAR	
		1984	1983		1984	1983		1984	1983
CLASS A MISHAPS	1	5	6	0	1	3	0	0	0
AIRCREW FATALITIES	2	7	3	0	0	3	0	0	0
TOTAL EJECTIONS	1	1	2	0	1	3	0	0	0
SUCCESSFUL EJECTIONS	0	0	2	0	1	0	0	0	0

TAC'S TOP 5 thru MAR 84

TAC FTR/RECCE	
class A mishap-free months	
52	355 TTW
31	58 TTW
24	4 TFW
21	37 TFW
18	27 TFW

TAC AIR DEFENSE	
class A mishap-free months	
134	57 FIS
87	5 FIS
84	48 FIS
43	318 FIS
34	87 FIS

TAC-GAINED FTR/RECCE	
class A mishap-free months	
143	188 TFG (ANG)
135	138 TFG (ANG)
134	917 TFG (AFR)
112	114 TFG & 174 TFW (ANG)
107	112 TFG (ANG)

TAC-GAINED AIR DEFENSE	
class A mishap-free months	
117	177 FIG
83	125 FIG
66	119 FIG
50	107 FIG
41	147 FIG

TAC/GAINED Other Units	
class A mishap-free months	
176	182 TASG (ANG)
160	110 TASG (ANG)
156	USAF TAWC
148	84 FITS
144	105 TASG (ANG)

CLASS A MISHAP COMPARISON RATE

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

TAC	1984	3.4	3.4	2.8									
	1983	6.9	5.3	3.4									
ANG	1984	0.0	2.3	1.5									
	1983	9.1	7.0	4.4									
AFR	1984	0.0	0.0	0.0									
	1983	0.0	0.0	0.0									
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

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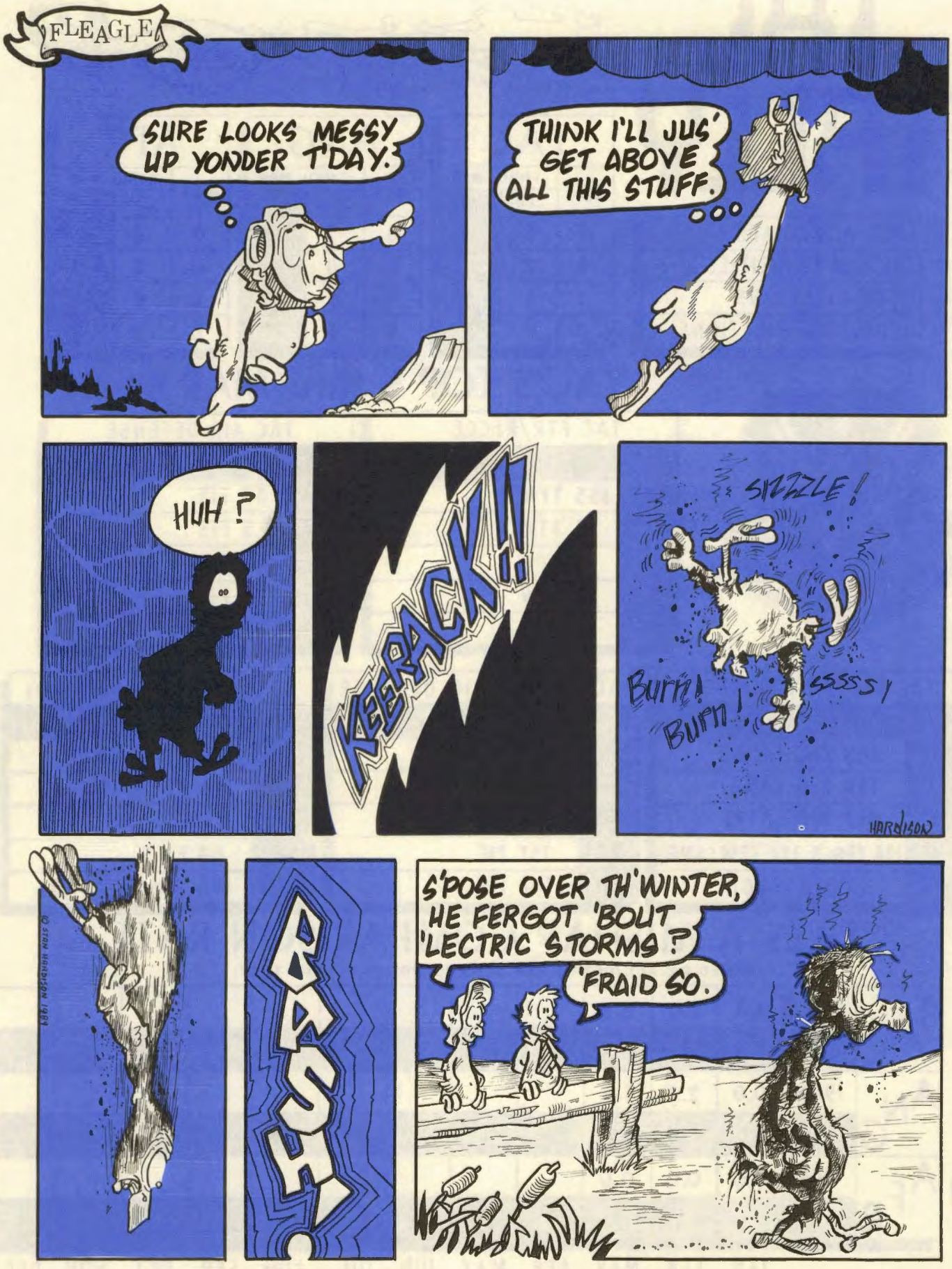
FLEAGLE
SURE LOOKS MESSY UP YONDER T'DAY.
THINK I'LL JUS' GET ABOVE ALL THIS STUFF.
HUH ?
KEERACK!!
SIZZLE!
Burn! Burn!
SSSSS!
HARRISON
S'POSE OVER TH'WINTER, HE FERGOT 'BOUT 'LECTRIC STORMS ?
'FRAID SO.
CRASH!
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