

TAC ATTACK

NOVEMBER 1982



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NIGHT FLYING
& FATIGUE... Pg 4

Angle of Attack



It's hard to believe that November is already upon us. Already we're hearing about the shopping days left until Christmas. In just over a month winter will officially be here.

The shortest day in the year, December 22, heralds the beginning of winter. These shorter days and longer nights mean more night flying for many of us and more night shift work for others. The article "Night Flying and Fatigue" warns us that our bodies aren't prepared for the sudden change in routines. Although the article is aimed at aviators, any of us that work changing shifts can learn about the fatigue problems we face.

Another hazard we'll soon be facing is cold weather. The cold becomes more dangerous when it's combined with wind or water. We're reprinting "Chill Charts" to show the effects of cold wind and water. We've arranged the charts so you can cut them out and post them if you'd like. But please wait until others have had a chance to read the magazine.

"Is a Circuit Breaker a Switch?" is an article for anyone who has access to circuit breakers in

the cockpit. The question is whether circuit breakers should be routinely reset. As several recent incidents show, the question needs to be thought out.

There are other areas that our readers need to think about, and we need you to write about them. "Author, Author" is addressed to you, the potential author, and it explains what kind of articles we need. Read it and then write for us. You'll be helping out your fellow workers and aviators all across the command.

We'll all be safer if we get a little help from our friends.

RICHARD K. ELY, Colonel, USAF
Chief of Safety



NOW

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TACRP 127-1

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VOLUME 22 NUMBER 10



It's November, and the days are not only getting colder but also shorter. Mention shorter days to a scheduler and what do you get? A night flying schedule. Fair enough. If we can get our night flying done by 10 p.m. and get home before midnight, so much the better.

The closer our night flying schedule is to our normal routine, the better we should perform. That's because of our circadian rhythms. "Circadian rhythm" is a term that snuck into the AFR 60-1 discussion on crew rest a few years ago. The word "circadian" comes from two Latin words, *circa* and *dies*, which mean "around" and "day," respectively. So, circa-

dian rhythm simply means your normal daily cycle. Humans, like most animals, are diurnal—awake during the day and asleep at night—as opposed to nocturnal. If you've ever kept a hamster in a cage with a squeaky exercise wheel near the bed where you were trying to sleep, you know the difference between nocturnal and diurnal mammals.

Why is this important? Because our blood pressure and volume, body temperature, volume of air breathed, amount of oxygen exchanged, heart rate, brain waves, physical vigor, and performance efficiency all vary with our circadian cycle. This is no hypothetical theory of biorhythms, but a well-docu-

mented daily cycle shown in research studies. These studies demonstrate a high correlation between body temperature, as an indicator of the cycle, and human performance. Typically, the body temperature varies from 96.5°F to 99.5°F. Higher body temperature corresponds with peak performance.

Among humans, differences in circadian rhythm seem to place people generally into one of two groups: the "owls" or the "larks." Larks are at their best in the morning, while owls peak in the afternoon. The low period for larks also comes a couple of hours before the owls. But the difference is only one or two hours. Both groups show poor performance when their body temperature is at its lowest in the middle of the night.

That's why we all should do better when we fly soon after dark in November rather than June. The earlier in the evening when we fly, the closer we are to our peak performance and the farther we are from our low period. But we're still on the downhill side of the performance curve in our daily cycle.

We often assume that we can correct this circadian rhythm problem simply by staying up later the night before we plan to night fly and then sleeping in that morning. But that doesn't solve the problem. Scientists have found that the quality and length of our sleep is also dependent on our daily cycle. We will simply not get as much rest even if we spend the same amount of time in bed. In addition to our body cycle depriving us of rest, the normal cycle of people around us will also affect our rest. When you sleep in the morning, you hear more environmental noise which disturbs your sleep even if you don't awaken and don't remember the noise.

The result of less restful sleep is greater fatigue. Fatigue generally is of two types, chronic fatigue and acute fatigue. Chronic fatigue is a long-term problem, often psychological at root, and often induced by continual stress. If you suffer from chronic fatigue you are in no condition to fly. The effects of chronic fatigue will add dangerously to the effects of normal short-term fatigue.

This short-term fatigue, acute fatigue, is the normal result of activity or lack of sleep. We're simply tired, and we'll recover after a good night's sleep. You might say that those who suffer from acute fatigue are *worn out*, but those that suffer from chronic fatigue are *burned out*.

Assuming you aren't burned out, what can you expect from acute fatigue? FAA research shows that it will directly affect your flying skills by disrupting your timing and your perceptual field. When fatigue disrupts your timing, you'll seem to perform your tasks as usual, but the timing of each element will be off



slightly. You'll have to do each element individually instead of as a unified whole. For instance, you'll have to concentrate harder on coordinating stick and throttle movements that would come naturally if you weren't tired. You'll be more susceptible to fall into the sinkhole on final by not matching thrust to changes in angle of attack.

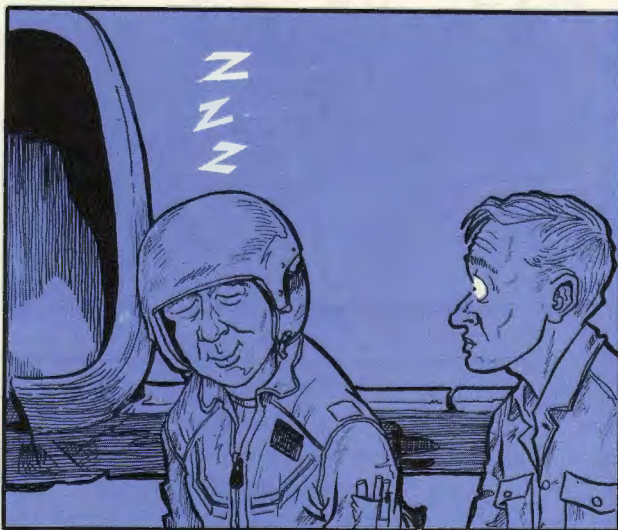
Your perceptual field is disrupted as you focus your attention upon what's in the center of your vision and ignore what's on the periphery. This tunnel vision is usually accompanied by roughness and loss of accuracy when you move the controls. When we lose peripheral visual cues, formation flying and air refueling become especially difficult.

That's a heck of a note, isn't it? Night flying is hard enough without us having to give up some of our skills to do it. We're diving down the backside of our circadian performance curve, so things aren't going to get better as we go along. Because we're suffering some loss of our skills due to fatigue, flying is

NIGHT FLYING & FATIGUE

more difficult. Psychological stress begins to build up because we aren't doing as well as we expected. The psychological stress works to our benefit at first: we get a needed shot of adrenalin. Our heart pumps harder and we breathe heavier. The liver supplies stored energy to the brain and muscles. We've kicked in another barrel on our carburetor, and we're burning fuel like a gas hog.

If we land and get back to the chocks before our body runs out of fuel, we'll probably be OK. But what



if we don't? Maybe we'll still make it, if we can finish the mission with minimum demands on our skills. Pray that nothing out of the ordinary happens under those conditions.

What can we do to prevent the problem? We can't eliminate it completely because it's built in. We are designed to operate better in the daytime than at night. We are also designed to have a regular pattern of rest and activity. We can't eliminate those design features, but we can take them into account and quit aggravating them.

We don't need to work 12-hour days when we're night flying. Stay home and rest. Watch the soaps or



read or nap, but don't try to catch up on those projects around the house. Resting in this way isn't as refreshing to your body as deep sleep, but it will help delay the onset of fatigue.

When you plan your night mission, allow for your reduced skills. Don't set yourself up for complicated tasks just because you can normally handle them in the daytime. Keep things basic and plan ahead as much as you can. After you are airborne, your reasoning and judgment will have deteriorated some; so don't get carried away with changing your mission in flight. If you start falling behind, don't hesitate to cancel mission elements. But don't be adding any.

This advice is for the normal TAC occasional night flyer. If you get into the Night Owl business as a regular, you'll be much less limited. Your circadian rhythm will adapt to your new activity cycle for the most part, but it won't happen overnight. And even after months of night flying, you'll find you still have design limits. If you adapt to them, you'll be able to hack your mission.

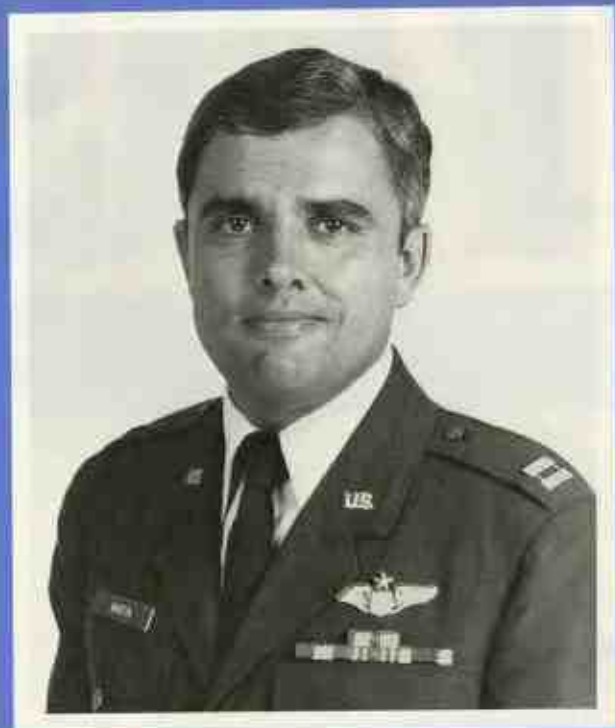
The rest of us aren't going to adapt. So we better realize that we are already up against the design limits of our system.

Sources: William J. Price and Daniel C. Holley, PhD, "Work, Rest and Pilot Performance," *Professional Pilot*, May 1981.

U.S. Dept of Transportation/Federal Aviation Administration, *Medical Handbook for Pilots*, May 1974.

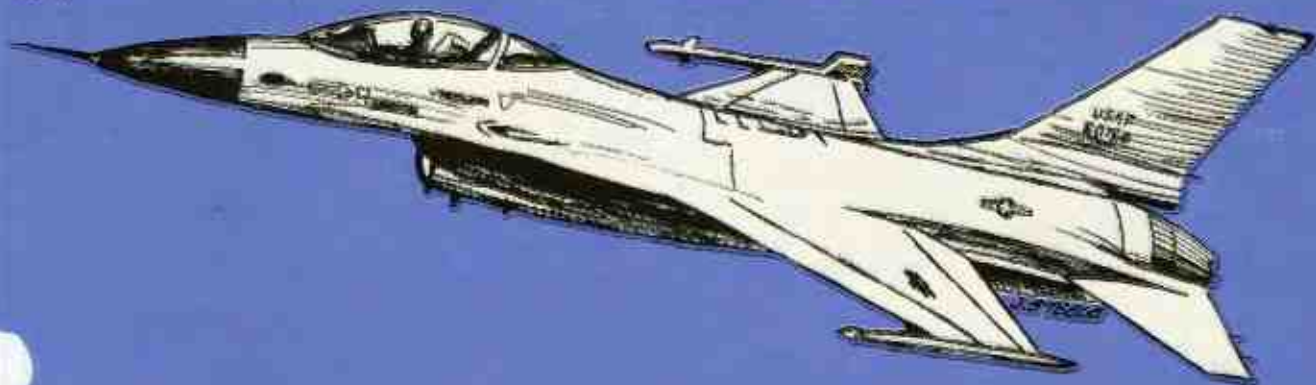
AIRCREW of DISTINCTION

On 4 August 1982, CAPTAIN GLYN D. MARTIN was flying an F-16 as an instructor pilot chasing a student during an overhead landing pattern. As the student landed, Captain Martin started his go-around when, at approximately 200 feet above the ground and 170 knots, he saw a very large bird close ahead. Too late to take evasive action, Captain Martin felt a thump as the bird hit the aircraft and went down the engine intake. A banging noise in the engine, which could be heard even in the control tower, indicated massive engine damage. The banging was accompanied by severe engine vibrations, rapidly decreasing engine rpm, and loss of thrust. Ground witnesses reported seeing sheets of flame coming from the rear of the aircraft. Captain Martin's low altitude and airspeed demanded quick, decisive action. He pulled the throttle back, attempting to clear the engine stalls, then raised the gear to reduce drag and increase glide distance while he pointed the aircraft away from the base in preparation for ejection. Captain Martin's quick analysis indicated that at very low power settings he could keep the engine temperature and rpm within acceptable limits and that he could sustain a slight climb at about 170 knots. Captain Martin declared an emergency and requested the runway be cleared. The engine was still stalling. Not knowing how long the engine might operate, he opted to make a 90-270 pattern and land opposite traffic. Through skillful maneuvering, he nursed the badly damaged engine through a modified flameout pattern to a safe landing. Subsequent investigation revealed massive compressor damage with catastrophic failure imminent.



Capt Glyn D. Martin
63 TFTS, 56 TTW
MacDill AFB, FL

Captain Martin's professional competence in calmly assessing a major engine problem in a critical phase of flight and his superior skill in maintaining control of a badly damaged aircraft not only saved a valuable aircraft but averted serious injury and possible loss of life. His actions qualify him for the Tactical Air Command Aircrew of Distinction Award.



TIPS

Fortune brings in some boats that are not steer'd.

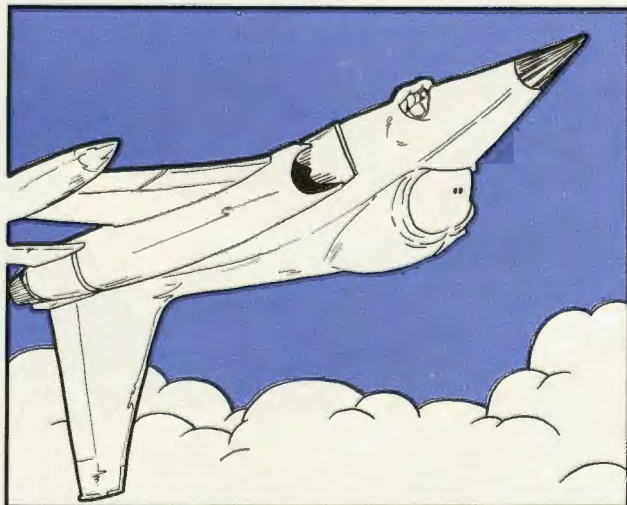
—Shakespeare

...interest items,
mishaps with
morals, for the
TAC aircrewman

THERE I WAS, FLAT ON MY BACK

Two F-16s were practicing air-to-air tactics. The wingman was employing defensive maneuvers. He entered a nose-low spiral, then unloaded the airplane to gain energy, and began a nose-high right rolling maneuver at 275 knots. While the wingman was in that nose-high maneuver, his leader called "Knock it off!" because the leader was approaching the minimum altitude of 10,000 feet.

The wingman was between 50 and 70 degrees nose high and inverted at 12,000 feet after lead's



call. The wingman glanced inside the cockpit and noticed that the airspeed was passing 120 knots and decreasing. When the pilot released back pressure, he was immediately pinned against the canopy by negative G-forces.

The nose of the aircraft seemed stable; the negative G-forces kept it slightly nose high. The flight leader saw that his wingman was in trouble with little or no forward velocity on the aircraft. The aircraft seemed to be falling straight down, inverted, and slightly nose high.

The leader called to his wingman that the airplane was in a pitch hangup. The wingman noticed that the nose was starting to rotate to the left, so he applied right rudder and stopped the rotation. Although he didn't crosscheck the angle of attack, the pilot felt he was out of control. He left the throttle in military power, extended the speed brakes, and engaged the manual pitch override (MPO). The pilot noticed that the MPO switch was hard to reach from his position against the canopy. While the pilot was going through the flight manual out-of-control procedures, his leader called out altitudes and aircraft attitudes on the radio.

Using manual pitch, the wingman commanded full forward stick. The nose pitched up to about 30 degrees nose high, still inverted. When he felt the nose begin to drop, the pilot commanded full aft stick, which brought the nose down to 40 degrees below the horizon. Then he rolled upright and recovered.

from the ensuing dive at 6,500 feet and 300 knots.

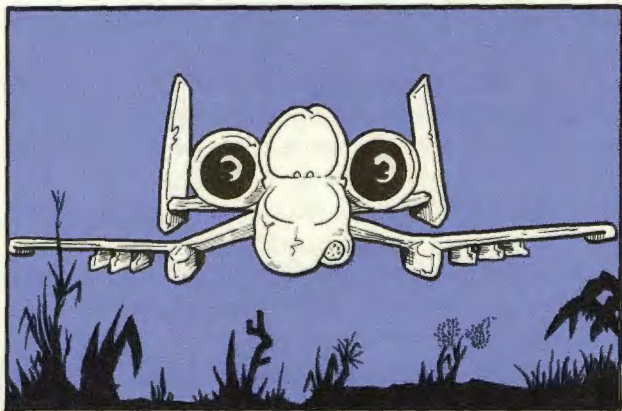
The flight called it a day after this bit of excitement, and they returned home, humbled but not hurt.

Technically speaking, we don't know if the wingman was in a deep stall or not since he didn't check the angle of attack. The airplane might have actually been ballistic and possibly self-recoverable, given enough time and altitude. But the pilot's use of the Dash One out-of-control procedures worked as advertised.

The problem was that it was neglect of Dash One procedures that got the pilot into this fix. The manual tells us to *begin recovering* the airplane before the airspeed decreases through 200 knots with pitch attitudes in excess of 60 degrees. The pilot knew that. He just wasn't keeping track of his airspeed and attitude. Before this happened, he may not have known why the Dash One insists on an early recovery, but he does now.

A FOUL IS A FRIENDLY GESTURE

A two-ship of A-10s was working on a non-USAF range. First they strafed; then they set up for low-angle bomb. As the pilot in number 2 pulled off from his first pass, he felt as if he were lower than normal.



Yet his altimeter and head-up display (HUD) indicated normal altitudes. And the range officer didn't say anything.

The pilot flew a second pass, ensuring that he released no lower than 600 feet on the HUD. This time he felt so low that when he pulled out, he pulled hard enough to get a brief stall-warning beeper before he eased off. He called, "Knock it off," then rejoined with his leader to check altimeters. In level flight at 2,000 feet, their altimeters and HUDs agreed. So they continued the range work, but the pilot in

number 2 pickled only on sight picture, not altitude.

Afterward, calibration of the gun camera film showed more than 300 feet of error in the HUD's indicated altitude. Maintenance workers found a white powder in the pitot lines, which was apparently causing a lag in the altimeter. The pilot was right: he had been too low. The range officer confirmed that the pilot had been below 100 feet on the second pass. *Yet no fouls were called.*

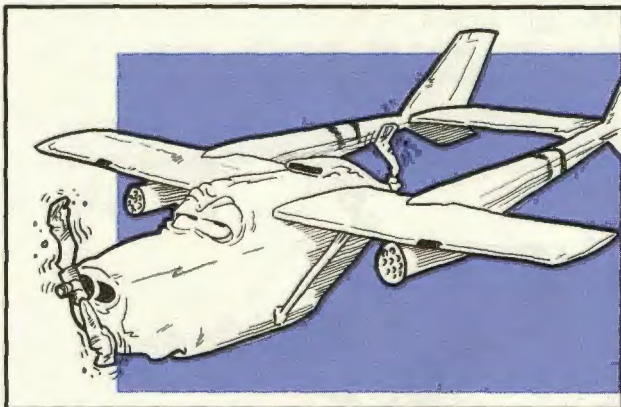
The crew on this non-USAF range was admittedly a little lax in calling fouls. But how about us? Have we ever not called a foul because we didn't want to get the pilot in trouble? Just suppose that pilot is on downwind wondering why the pass didn't look right. By not calling a foul, we could get him in real trouble.

On the other hand, if you're the pilot on downwind, don't rely on the range officer to tell you when you're too low. If it didn't look right or feel right, don't try it again. Ask the range officer what it looked like to him; but in the final analysis, it's your hide, and only you can save it.

VERY IMPRESSIVE TALK

An O-2 was on a VFR proficiency flight. Along for the ride as a passenger was a newly commissioned member of the unit who was scheduled to go to pilot training. The O-2 pilot was supposed to show the new guy what flying in the unit would be like.

They took off and headed for another nearby airport, where the pilot demonstrated a couple of visual patterns and landings. On the third pattern, as the pilot rolled out on downwind and pulled back the throttles, he silenced the landing gear warning horn so



that he could more easily talk to the passenger about aircraft procedures. The pilot turned base leg and

TAC TIPS

set one-third flaps. The tower cleared them to land. Everything seemed fine until the flare. With no wheels down, the fuselage and both propellers hit the runway.

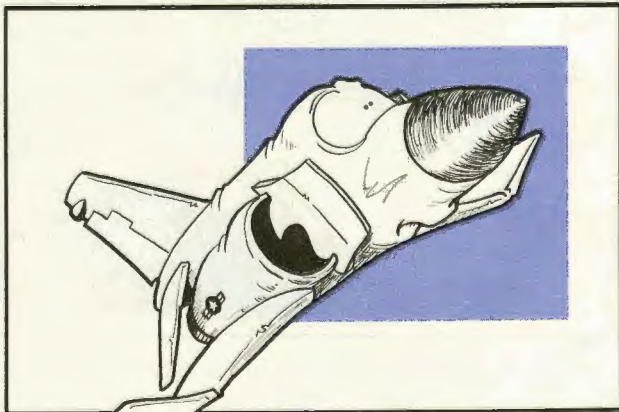
When the pilot felt the airplane hit, he pushed the throttles to the wall and began to go around. At maximum power the engines were now producing only 2,700 rpm each instead of the normal 2,800. They climbed to 3,000 feet and did a controllability check. The pilot headed toward their home field while a chase plane joined up and checked them over. The chase reported that they looked OK. The landing gear came down without any problems, and they landed. Damage to airplane was about \$14,000, mostly to the engines.

That must have been a real impressive briefing on aircraft procedures that the pilot gave his passenger. But we suspect that the new guy was more impressed by the results.

CORPORATE MEMORY LOSS

You'd think that by this time we'd know all the quirks of the F-4. Maybe we do, but we've buried the knowledge in the depths of our corporate memory. Somehow, the Phantom still manages to catch us off balance at times.

The most recent occasion followed a false fire warning light on the right engine. (Actually, there are no false fire lights in the air. A fire light is a fire light. The folks on the ground can decide later what's false and what's real.) The pilot brought the engine to idle, but the fire light didn't go out. So, following the checklist procedures, the pilot shut down the engine. The light stayed on for a few seconds after shutdown, then went out. The crew headed for home,



which was the closest suitable field, and dumped fuel to lighten up for the single-engine landing. On the way, the fire light would come on every now and then, but it would go out in a few seconds.

The aircrew set themselves up on a straight-in approach. At 2,000 feet above the ground, they were in solid clouds. Twelve miles out on extended final approach with 230 knots, the pilot lowered the gear and flaps together. The gear came down. Then, several seconds later, the airplane began rolling to the right. Stick and rudder against it didn't stop the roll; the airplane rolled up to 90 degrees of right bank. The airplane descended and broke out of the clouds at 1,400 feet. At 1,000 feet the pilot got the airplane back under control with full left rudder. As they continued the approach, the aircrew noticed that the utility and PC-2 hydraulic systems were fluctuating between zero and 3,000 psi. The fluctuations didn't affect their landing; they got it on the ground OK.

No major problems were found in either hydraulic system. As best the troubleshooters could figure, the problem was caused by insufficient bleeding of the hydraulic systems on the ground before launch and by lowering the gear and flaps together. The fluctuations in pressure suggest that both the utility and PC-2 systems had air in them. If there was any air in the utility system, it could have cavitated the utility hydraulic pumps when the gear were lowered. The malfunctioning utility system then caused a transient split flap condition that rolled the airplane to the right.

The unit has submitted an AF Form 847 to include a statement about checking the hydraulic pressures after lowering the gear and before lowering the flaps on a single-engine approach. Sounds like a good idea. But it seems to us that we were taught years ago not to lower the gear and flaps together with an engine out. Looks like none of us bothered to write that down anywhere. So it slipped our corporate memory.

YOU ANALYZE THIS ONE

After landing normally and deploying the drag chute, an F-4 pilot got on the brakes at about 130 knots. He pushed the pedals to the stop but didn't notice any braking action. So he released brakes, disengaged the antiskid, and reapplied the brakes. The left main tire blew out 500 feet later and the right tire blew out 500 feet after that.

We're tired of writing about it every month. This time, you tell us what went wrong.



TOUGHER LAWS ON THE WAY

Several states have now passed laws that make driving under the influence of alcohol or drugs tougher to beat and also that make the use of child restraints mandatory for children under 4. If you live in one of these states, check out the details before it's too late.

Twenty-six states have made penalties higher and costs more expensive for vehicle operators caught driving under the influence of alcohol or other drugs.

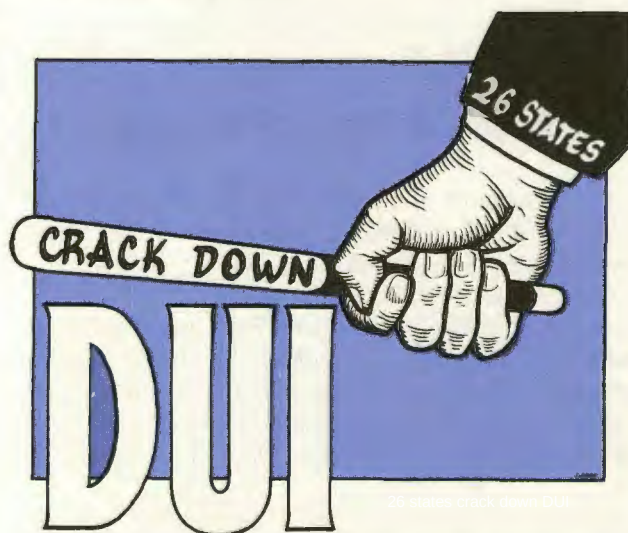
"Driving under the influence" (DUI) is a term used for driving after an intake of anything that impairs judgment, like alcohol or drugs. "Driving while intoxicated" (DWI) means the driver has reached the legal level of alcohol intoxication.

Results of both DUI and DWI flash daily in the headlines and on television screens: damage to property, bodies maimed for life, accidents wiping out entire families. Most of these costs cannot be measured. And because of the far-reaching effects

on families and the entire nation, laws were passed to classify certain DUI cases as criminal. Now the driver can't get by without paying.

Safety officials say, in addition to fines, some of the rising costs are for bail bonds, paying the police for an impounded car, hiring an attorney, paying for a court-ordered school for drunk drivers, and paying higher insurance premiums for years to come. In some states, officials say a simple DUI arrest—not involving collision, injuries, or deaths—can cost the driver as much as \$3,500.

The following states have tightened DUI enforcement, strengthened penalties, or enforced rehabilitation programs: California, Connecticut, Delaware, Hawaii, Illinois, Indiana, Iowa, Kansas, Louisiana, Maine, Maryland, Minnesota, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Mexico, New York, Oregon, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming. Although the laws vary in these states, most are quite tough and have all been tightened.



The Air Force fully supports these efforts. Commanders at all levels have the tools necessary to prevent the problem—and when it does occur—to deal with it firmly. The consequences to an Air Force member both in the civilian community and on base are severe.

After January 1, 1983, 17 states will also require all children under 4 to wear seatbelts or to use other safety restraints in a moving vehicle. All Air Force installations in those 17 states will also comply with the state laws. The states are: Alabama, Connecticut, Delaware, Florida, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, New York, North Carolina, Rhode Island, Tennessee, Virginia, West Virginia, and Wisconsin.

DOWN TO EARTH



No matter where you live, if you want to borrow or rent a child-restraint seat, call your local department of motor vehicles, hospital, or Red Cross for more information.

—Adapted from Air Force News Service articles

BABY CARRIERS AND COFFEE MAKERS

Baby carriers and coffee makers. What do they have in common? Defects, and the base exchange service wants you to know about it.

Gerry Deluxe Kiddie Seats, Model 048, manufactured between March 1979 and February 1981 have defective hinges that could pinch the child's fingers. Affected carriers are those with the following two-line date codes printed beneath the carrier:

$\frac{9}{64}$ through $\frac{93}{65}$ $\frac{0}{2}$ through $\frac{03}{65}$ $\frac{1}{2}$ through $\frac{1}{60}$

Shields to cover the two hinges, along with instructions for putting them on, will be mailed to customers requesting them. To get the instructions and shields, stateside customers outside Colorado can call toll-free 1-800-525-2472. In Colorado call commercial (303) 457-0926. Customers overseas can write to Gerico, Inc., 12520 Grant Drive, Box 33755 Denver, Colorado, 80233.

Some General Electric coffeemakers are being recalled for possible fire hazards. The recall affects all DCM-15 models produced before June 1978. Officials say that the appliances pose a fire hazard if their thermal fuse fails to function when they overheat.

Customers may check numbers at the bottom of their coffeemaker to see if they have a recalled unit.

Those numbers are:

81-3382-0	634 through 717
81-3385-0	634 through 717
81-3387-0	618 through 822
81-3390-0	704 through 717
81-3387-0	618 through 822

All stateside customers can call a G.E. toll-free hotline. Customers, except those in Maryland, call 1-800-638-8326. In the Maryland area call 1-800-492-8366. Customers in Alaska, Hawaii, Puerto Rico, and the Virgin Islands call 1-800-638-8333. Customers in Panama can contact local G.E. distributors.

In other areas, customers should return their coffeemakers to local exchanges for new models or a refund. New coffeemakers are not involved in the recall.

—Adapted from Air Force News Service

HAVE YOU TESTED YOUR SMOKE DETECTOR LATELY?

Making sure your smoke detector is always working is just as important as installing one. Smoke detectors can only save lives if they work. You have to test them frequently. Some authorities suggest testing detectors every 2 weeks; some suggest testing at least once a month. Whatever you decide is reasonable, at least once a month take some time and test your smoke detectors. If you have battery-powered detectors, testing more often than every 2 weeks will weaken the battery; so always have spare batteries on hand.



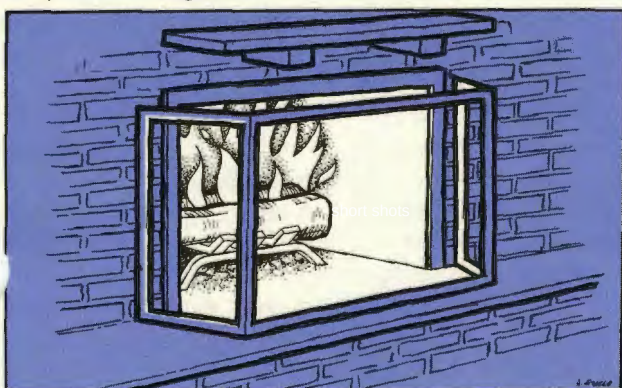
The test: Pushing the test button is not a test. That only insures that the horn or buzzer is working. You need to give the detector some real smoke. Hold a candle 6 inches under the alarm. If you're testing an ionization detector, let the flame burn. To test a photoelectric unit, extinguish the candle and let visible smoke drift into the detector. Within 20 seconds the alarm should sound. To stop the alarm, remove the candle or fan the smoke away from the detector.

Newer detectors have more refined test systems and don't need to be tested with real smoke. Check the package or instructions to see if your detector has this feature.

If you have children, don't make testing smoke detectors a game. Fire is serious business; they aren't too young to learn that.

COZY FIRES IN THE FIREPLACE

There's nothing like spending a relaxing evening in front of a fire in the fireplace. But fire should always be handled with caution. If you really want to relax the next time you have a fire in the fireplace, keep these things in mind:



- If you haven't used the fireplace for some time, check the hearth, flue, damper, and chimney. If you find a quarter-inch-thick buildup of creosote, clean the chimney before you use the fireplace.
- Always keep a metal screen in front of the fireplace to catch flying embers.
- Be sure no flammable materials are hanging down from the mantel.
- Don't use flammable liquids to start a fire, and never burn charcoal in the fireplace. Burning charcoal gives off dangerous amounts of carbon monoxide.
- If you use man-made logs, don't break them to quicken the fire.
- Always make sure the fireplace fire is out before you leave the house or before going to sleep for the night.
- Never close the damper with hot ashes in the fireplace. When the damper is closed, hot ashes build up enough heat to restart the fire.
- Don't assume you're leaving cool ashes in the fireplace. Have an airtight, fireproof container next to the fireplace and put the ashes in it, unless your fireplace has glass doors you can close. ➤



Excuses, Excuses. Here's some reasons we've heard why some people don't wear seat belts: "They're uncomfortable and I can't move around." "They wrinkle my clothes." "They're too loose to protect me." "I'm not driving fast and I'm not going very far." "I'll be trapped in the car if I crash." "The seat belts are under the seat." "I forgot." Of course, none of us are that foolish, are we?

Warm Ice. Be careful when driving on melting ice. That's the most hazardous winter-driving condition according to the National Safety Council. Cars slide farther as air and ice temperatures increase, and a heavy car slides farther than a light one.

Cold-Weather Dress Tips. Wear two or more loose-fitting layers of clothes (preferably wool) rather than one tight-fitting layer. Always wear a hat. And mittens are better than gloves because the fingers can make contact with each other, keeping hands warmer. Don't lace your boots too tightly because that might keep blood from flowing to your feet.

Now You're in Cold Water. Something happened and you find yourself in cold water. Grab onto something to keep you afloat if you aren't wearing a life jacket and stay as still as possible. The more you tread water the faster your body cools. And staying in the water cools you faster than air, so try and get as much of your body out of the water as possible. You lose about 50 percent body heat from your head, so cover it. If you're with other people, huddle together in a circle, and get as close as you can. You can also get into a heat escape lessening posture (HELP) or fetal position. Don't try to swim for shore unless you're sure you can make it. ➤

IS A CIRCUIT BREAKER A SWITCH?



Most of our airplanes have only a few essential circuit breakers in the cockpit where the aircrew can reach them. Our notable exception is the F-4, which has wall-to-wall circuit breakers in the back seat. That unique configuration has apparently given Phantom Phlyers a different attitude toward circuit breakers. The implication seems to be that since they're handy, they can be used like switches.

Under some circumstances, the Dash One agrees. In the emergency procedures section, many times the checklist calls for pulling or resetting circuit breakers in hopes of alleviating the emergency. But you don't find those kind of steps in the *normal* procedures. The flight manual has us insure that all the circuit breakers are in before we start engines. After that, the manual doesn't tell us to reset circuit breakers as a normal procedure. The Dash One call for checking the circuit breakers during ops checks. It doesn't say to just push one back in if you find it popped.

What does a popped circuit breaker mean? It means there's something wrong with that circuit—the electrical current is too strong. Circuit breakers protect against electrical fires, among other things. In short, when a circuit breaker pops, you have a *discrepancy*. If that discrepancy is an emergency, you do with the circuit breaker what the checklist directs. If it's not an emergency, don't play the role of a troubleshooting electrician.

We've seen three cases recently where aircrew members decided to become part-time electricians. All three resulted in explosive incidents.

In the first, an F-4 was on a surface-attack training mission. The first bombing pass seemed normal, but on the second pass the range didn't spot their bomb. After the range work the flight joined up, and the wingman confirmed that lead had a hung BDU-33 on the left inboard TER. Leader had safed his switches on the range; he rechecked that the switches were safe and continued climbing out from the range. Later, when they leveled off at 22,000 feet, the WSO noticed that the arm power circuit breaker was popped, so he reset it. It immediately popped again. At the same time the wingman saw the bomb

fall off the TER. Luckily, the flight was over an unpopulated swamp when the bomb fell.



There was a short in the TER cable. That's why the circuit breaker popped. When the WSO reset the circuit breaker, he allowed the shorted circuit to release the bomb, bypassing the safetied weapons switches.

Think that's a one-of-a-kind episode? Read on.

Another F-4. Another range mission. This time after two successful dive toss deliveries, the station select Arm light went out. The aircrew tried three passes in direct mode with the light out, but no bombs released. They finally gave up and headed



home. On the way the WSO noticed five circuit breakers were popped. One of the circuit breakers was for centerline armament power; the WSO pushed it in. It wouldn't stay in, but the damage was done. The wingman saw two BDU-33s fall from the airplane's centerline MER.

Again the cause was a short circuit, this time in a cannon plug. Again we were lucky; the bombs hit in a sparsely populated area.

After this incident, this particular unit took some action. They put out the word that aircrews were not to reset any armament circuit breakers once they'd departed the bomb range. If you'll notice, there are a few loopholes in that guidance. It wasn't long before an aircrew fell through a loophole.

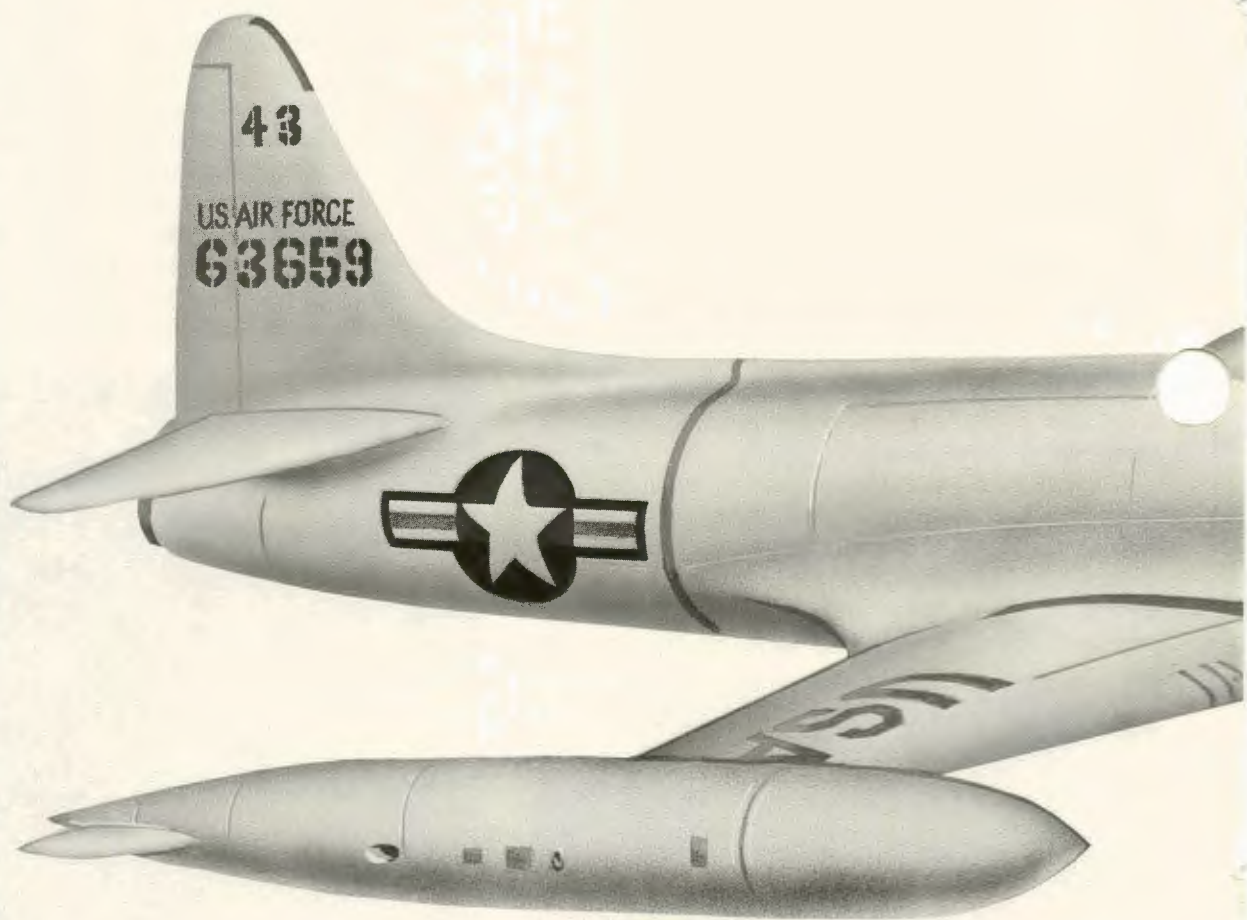
Another F-4 from the same unit was waiting to take the runway for takeoff, loaded with an AN/ALE-40 chaff and flare dispensing system. As the aircrew sat there awaiting clearance, the WSO happened to notice that the circuit breaker to the AN/ALE-40 system was popped. Since they hadn't even gotten to the range yet, much less departed it, he knew he could legally (if not wisely) reset the circuit breaker. So he did. Two BBU-35/B squibs fired, dumping chaff



on the taxiway. Fortunately, nobody got hurt, but somebody had to clean up the mess.

Maybe this string of relatively minor incidents is trying to get a message through to us. We haven't hurt anyone yet. Do we have to keep playing with circuit breakers until we do hurt or kill someone? Can't we leave electrical troubleshooting to the specialists?

T-33 "T-bird"





JOHN STEELE '82

chock talk

*...incidents and incidentals
with a maintenance slant.*

FOD IS UNFAIR

A pair of F-4s made a formation landing. At about 90 knots on landing roll, the right main tire on the lead aircraft blew out. The pilot applied the proper emergency procedures and kept the airplane under control. He stopped straight ahead on the runway without running into his wingman.

Out on the runway at the point where the tire blew, investigators found a tachometer generator adapter off of an O-2A. Marks on the adapter matched marks on the F-4's right main landing gear rim.

The day before, a maintenance technician had removed and replaced a tachometer generator adapter on an O-2. The old adapter was left in the engine compartment. The next day, that O-2 was scheduled to fly for the first time since the maintenance work. The O-2 pulled onto the runway; and when the engines were run up, the adapter fell out onto the runway. The F-4's tire blew at the place on the runway where the O-2 had begun its takeoff.

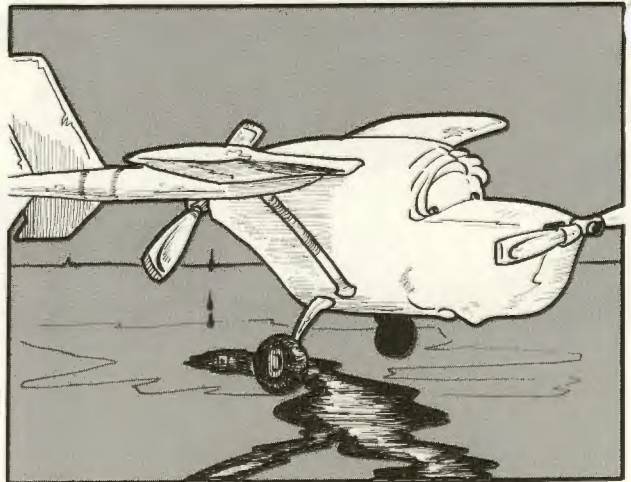
FOD is unfair. It penalizes people who had nothing to do with causing the FOD. A maintenance worker on an O-2 put two F-4s in jeopardy, not to mention the O-2, which could have suffered prop damage itself. When others pay for our mistakes, we have a special obligation to be careful.

SECOND HAND PARTS

While flying a functional check flight (FCF) in an O-2, the pilot feathered the rear propeller as part of his checks. At 120 knots he then tried to unfeather the prop, using the flight manual procedures. The normal procedures didn't work. The pilot tried an alternate airstart using the starter motor. The engine cranked to about 200 rpm but wouldn't continue without the starter engaged. The pilot then declared an emergency and made a successful single-engine landing.

On the sortie before this one, the airplane had also flown an FCF. On the earlier FCF the engine had also failed to unfeather normally, but it did unfeather when the starter was used in the alternate method. On both FCF sorties the propeller accumulator had been serviced and checked good on the ground before the flights.

Maintenance investigators found the source of the unfeathering problem in the prop governor. The check valve in the governor, which is supposed to hold the oil pressure in the prop accumulator, was misaligned and allowed the oil to seep out. This



check valve is located directly beneath a 90-degree elbow that connects the prop accumulator line to the governor. The 90-degree elbow must be repositioned depending upon whether it is used in the front or rear engine.

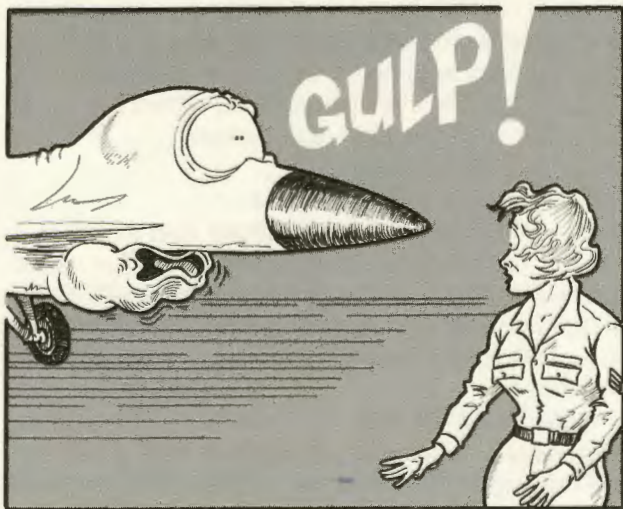
About a week earlier, some maintenance workers had borrowed the prop governor on this rear engine in order to run some checks on the front engine of another O-2. They had to reposition the 90-degree elbow to install the governor on the other O-2 and then again to reinstall it on this engine. After the governor was reinstalled, this airplane flew the first FCF, on which it had unfeathering problems.

After that FCF, maintenance workers replaced the prop governor on the rear engine. The new governor had the 90-degree elbow in the wrong position. Properly repositioning the elbow requires placing it in a vise while it is still attached to the governor. To save the time and effort involved in this procedure, a maintenance technician decided to remove the 90-degree elbow from the defective governor and put it on the new governor. This particular elbow had been through several gyrations by this time, so it did not properly align with the check valve. The misalignment created the unfeathering problem.

In sum, a maintenance shortcut led to an emergency in flight and a single-engine landing. Not a very effective shortcut since it increased everyone's work.

F-16 SWALLOWS HEADSETS AGAIN

An F-16 returned from a normal mission at the gunnery range. After turning off the runway, the airplane was marshaled into the dearm area. Two members of the dearm crew did the dearming. One of them approached the F-16 from the right side and chocked the right main gear as the second crewmember marshaled the airplane. The crewmember who had chocked the wheel then moved forward along the right side of the fuselage, stopping about seven feet forward and two feet to the right of the engine intake. She then turned and looked toward the intake. The hearing protectors the airman was wearing were sucked off her head and into the engine in-



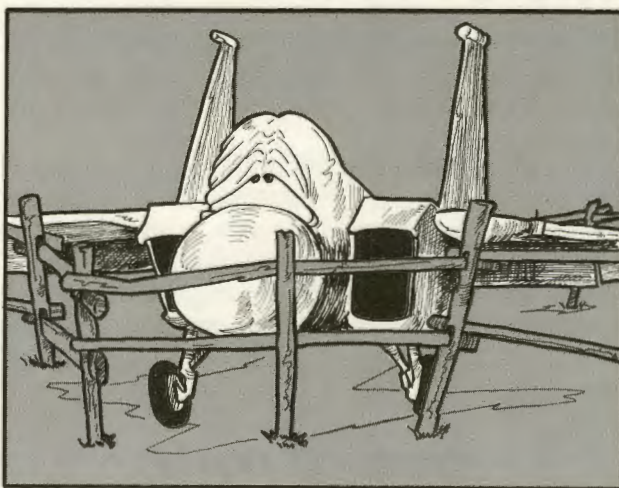
take. The other crewmember saw what had happened and signaled the pilot to shut down. The engines which had been at idle power, suffered exten-

sive damage to all stages of the fan and four stages of the core.

The airman who lost her headset was inexperienced, although she had completed all her 3-level training. The 5-level specialist who was working with her hadn't allowed for her low experience level in deciding how closely he should supervise her. Neither of the two fully appreciated the hazards involved in working close to an operating F100 engine. The F100 puts out a lot of thrust; that means it sucks in a lot of air. Air is all it can handle. Those facts ought to be learned early in our training programs.

HIDDEN FOREIGN OBJECTS

During postflight, an F-15 crew chief found some apparent foreign object damage (FOD) in the first stage fan blade. The crew chief notified the quality assurance office, who impounded the airplane. Continued investigation showed that the damage was



confined to the fan module—26 first stage blades and 8 second stage blades were damaged.

The damage was caused by a hard, round metallic object, but no parts were missing forward of or within the intake. When investigators checked the left vari-ramp, however, they found four rivets and metal shavings in a compartment under panel 25L. The last maintenance done in this area had taken place a month earlier during the number 3 HPO. A job had been submitted calling for the replacing of defective nutplates under panel 25L. The discrepancy was not carried as a red-X item. Structural repair specialists replaced the bad nutplates, but no supervisor inspected their work because no entries had been made in the 781A.

The vari-ramp was X-rayed after the HPO, but the

CHOCK TALKS

X-rays didn't show the foreign objects because they were directly under the first ramp hydraulic actuator and the mass of the actuator hid them. During this investigation, more X-rays were taken of the airplane. The new X-rays showed a foreign object under panel 20L that wasn't there in the earlier shots. The object was a metal shaving that apparently had migrated there from the area under panel 25L. Foreign objects can migrate to the engine from this area. In fact, a high resolution photo of the damage to this engine revealed an impression which matched panel 25L nutplates.

Disturbed by these findings, this unit began inspecting all of their F-15 variramps. They found many kinds of foreign objects—metal shavings, rivets, safety wire, nutplates, and the like. Most of the objects were found below the first ramp actuator and the bypass door actuator, lodged in small pools of grease. The grease accumulates there after the actuator rods and housing ends are lubed. Foreign objects trapped in the grease aren't seen, and they get by X-ray detection because of the mass of the actuator.

The unit decided that the only reliable way to detect foreign objects after maintenance is to clean up the excess grease first, then look at all accessible areas and follow up with the X-rays.

This unit learned from its experience. How about the rest of us? Are our foreign object inspections thorough? Or are we going to wait until we damage an engine?

EXCITEMENT ENOUGH

Flight control problems can bring unwanted excitement into the life of an aircrew. Here's a good example.

An F-4 aircrew was practicing basic fighter maneuvers. The pilot flew a jink-out maneuver, using negative G-forces, until the airplane was in a 30-degree dive. Then the pilot tried to pull out. He couldn't. The stick would not come back when he pulled on it. The airplane was now in a 60-degree dive. On a hunch the pilot pushed all the way forward on the stick, steepening his dive even more, then pulled back smoothly on the stick. The stick moved aft this time, and the airplane recovered from the dive. The aircrew recovered from heart palpitations and flew the airplane back to a safe landing.



The cause of the thrills was incorrect installation of the right stabilator torque tube. Almost six months earlier, the torque tube had been disconnected from the bellcrank so that a worn bearing could be replaced. When the bolt was reinstalled, it passed through both ears on the bellcrank but missed the rod end on the torque tube. Neither the worker who did the repairs nor his supervisor who inspected the work noticed the error. The airplane was released for flight. Up to this incident the airplane had flown over 40 sorties without any flight control problems. The stabilator was being controlled through the left torque tube. The right torque tube rested on top of the attacking bolt and didn't cause any problem under positive G-forces.

When negative G was applied on this sortie, the torque tube floated up and wedged against the rear cockpit rudder pedal linkage. The stick then could not be moved aft. When the stick was moved full forward, the torque tube moved aft far enough to clear the rudder pedal linkage. That's how the pilot freed the stick.

Considering the cramped space in the missile well area where the maintenance worker had to operate, the missing tirod end of the torque tube is an easy enough error to make. What isn't so understandable is that both he and his supervisor didn't find the mistake. These are the kinds of problems that make aircrew members prematurely gray.

CHILL CHARTS

The title 'CHILL CHARTS' is rendered in a large, bold, sans-serif font. Each letter is topped with a small, rounded snow cap. From the bottom of each letter, several long, thin icicles hang down, varying in length and thickness. The icicles are drawn with simple lines and some internal shading to give them a three-dimensional appearance. The overall effect is a playful yet chilling visual pun on the title.

Some of us may still be enjoying Indian summer, but the cold weather is on its way, whether we're ready or not. It's been years since we printed charts which show the effects of cold temperatures and wind or water, so let's refresh our memories.

The first of the two charts that follow gives "equivalent chill temperatures." In the winter we hear a lot about chill factors. This chart was developed some time ago by Dr. Charles J. Eagan at the Arctic Aeromedical Lab, and it shows how quickly exposed flesh can freeze. If you look at the temperatures and winds involved, you can see that most of our bases encounter dangerous conditions at some time during the winter.

The chart tells all of us that we have to be properly dressed for the conditions we encounter. For the troops on the flight line, it means working at reduced efficiency. Tightening fasteners properly while wearing heavy gloves isn't easy. It takes patience and concentration to get the job done right. Those of us who are planners and supervisors have to allow more time to get the job done. And just like the extremely hot days of the summer, cold days mean we have to limit the exposure time of our troops on the line.

For aviators the problem is a little different. Like our maintenance and weapons troops, we have to resist the temptation to take shortcuts in the cold weather. The items on the preflight checklist don't change with the temperature, so we have to dress properly for the time we're going to spend on the ramp. But in addition to conditions on the home field, fliers need to take into account conditions in the other areas they're flying over. The temperature might be a balmy 70 degrees when we take off from

Luke at noon, but what's it going to be like during the night in the mountains we're flying over? We can't forget that we might very quickly be put into a cold weather survival problem.

Many of us could just as quickly find ourselves in a water survival situation. That's what the second chart shows us. The source of the information is the U.S. Naval Safety Center. If anyone knows about the problems of surviving in the water, it should be our Navy friends. Don't just look at the "lethal" envelope, the "marginal" area only offers a 50-50 chance of surviving. Those aren't our kind of odds.

The lesson from the water exposure chart is not just that we should be wearing poopy suits more often than we do; it's also that we should avoid unnecessary flights over cold water. Our fellow aviators in the Navy don't have much choice, but sometimes we do. Planning and scheduling of training areas over water can play a part. So can the way we plan our individual flights; it may pay to take the long way around and stay over land instead of taking the short cut across a large, cold body of water.

Certainly, knowledge of the odds of survival in cold water should affect our decision when and where to get out during a controlled bailout. Seaward may be a good direction to head the airplane, but not our bodies. When we first encounter an emergency over water, step number one may well be to fly toward the nearest land. And don't hesitate to call "Mayday!" early; the head start the call gives to rescue crews might be the difference between making it and not making it.

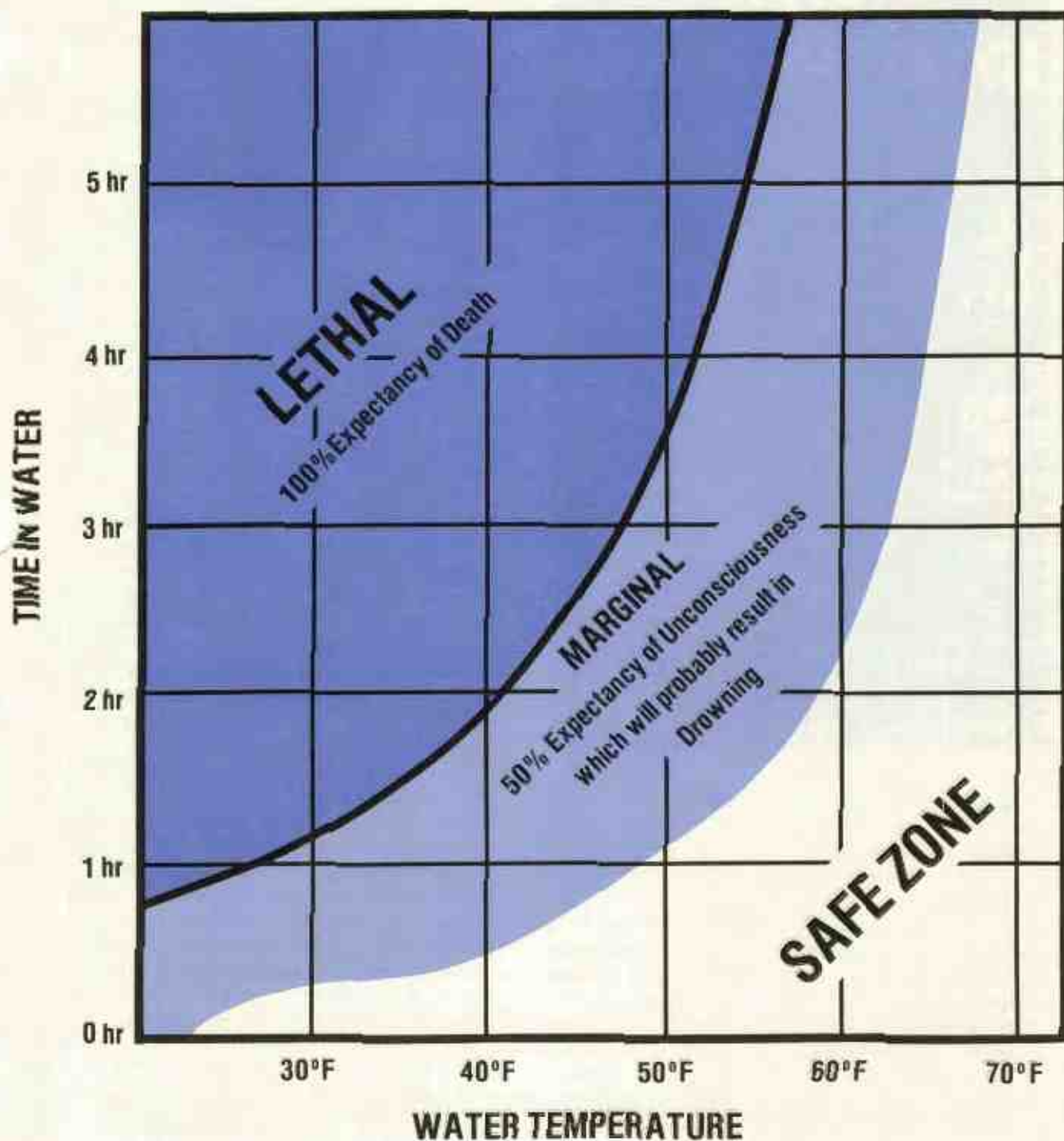
What both these charts are telling us is that wind and water steal heat from our bodies. In cold temperatures we can't afford that heat loss. It may cost us a limb or it may cost us a life if we aren't prepared.

COOLING POWER OF WIND EXPRESSED AS "EQUIVALENT CHILL TEMPERATURE"

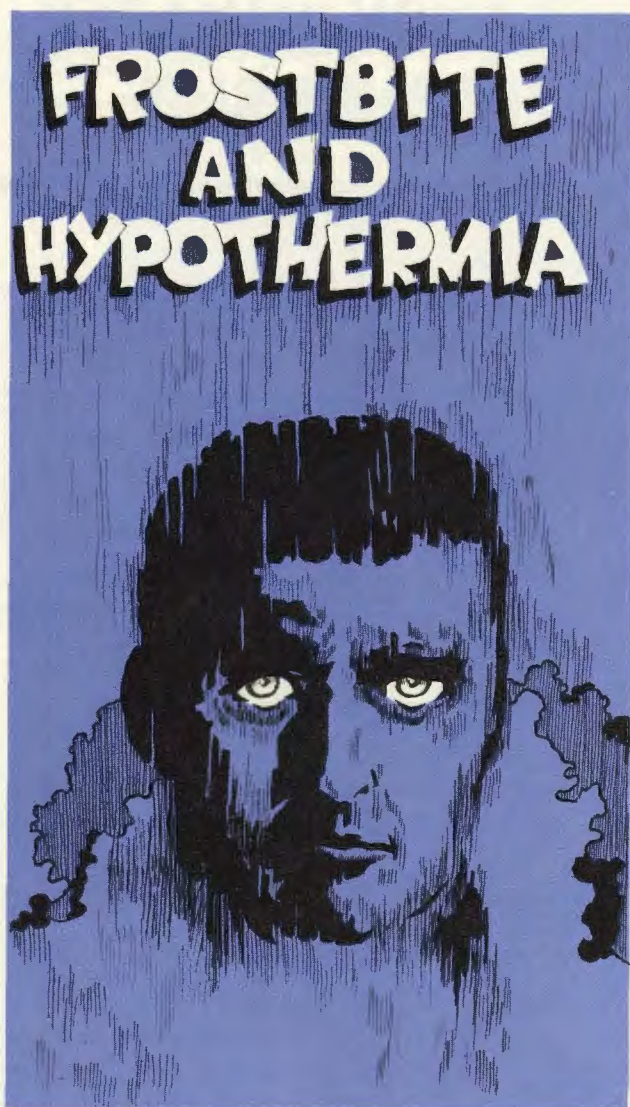
WIND SPEED (MPH)	TEMPERATURE (° F)																
CALM	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40
EQUIVALENT CHILL TEMPERATURE																	
5	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
10	30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70
15	25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85
20	20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-95
25	15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105
30	10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110
35	10	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115
40	10	0	-5	-15	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115
	LITTLE DANGER					INCREASING DANGER (Flesh may freeze within 1 min.)					GREAT DANGER (Flesh may freeze within 30 sec.)						
	DANGER OF FREEZING EXPOSED FLESH FOR PROPERLY CLOTHED PERSONS																

Winds above 40 mph have little additional effect.

TIME OF LIFE EXPECTANCY IN WATER WITHOUT ANTI-EXPOSURE SUIT



Courtesy U.S. Naval Safety Center



frostbite and hypothermia

The chill charts in this issue make it clear—cold and wind or water can be hazardous to your health. After reading the charts, you know what's dangerous. Now here are some more cold facts.

There are two conditions that result when we get too cold: frostbite and hypothermia. You can have frostbite without hypothermia or both at the same time. The difference between the two is that frostbite affects tissue and hypothermia affects core or inner body temperature. Two protective mechanisms help keep our core temperature constant when we are exposed to severe cold for a short time or moderate cold for a longer time: (1) Our blood vessels constrict, which doubles the insulation provided by the skin, and (2) our muscles involuntarily quiver, creating extra heat (that's what we call shivering). When we are exposed to very low temperatures for an ex-

tended period, these mechanisms are overcome and our core temperature drops. But our body still tries to preserve life, so another mechanism takes over—a metabolism slowdown. That's why it's important to always try and revive a very cold body even though you don't feel a pulse because they body might just be in metabolism slowdown.

Of the two conditions, frostbite is the most common. Hands, feet, and ears are usually affected from exposure to below-freezing temperatures. You have frostbite because ice crystals form within the tissue which resulted from intense constriction of blood vessels. You'll know you are frostbitten when the affected tissue first becomes cold, then painful, then numb. The area could be pale or violet and feel hard. Sometimes blisters form and the skin might darken.

To thaw frostbitten tissue, immerse the area in water between 100 and 112 degrees. Keep the affected area in the water until it is pliable and has good skin circulation, about 30 to 60 minutes, and keep the area clean to avoid infection. Never rub the area with snow, and if you aren't sure just how serious a case of frostbite you have, consult a doctor. If a person has frostbite and hypothermia, treat the hypothermia first.

Hypothermia occurs when our body's core temperature drops below 98.6°. Warning signs of hypothermia are drowsiness; confusion; slurred speech; shallow, very slow breathing; and a slow, sometimes irregular heartbeat. You have to be exposed to very low temperatures for an extended period before you become susceptible to hypothermia; however, infants and the elderly with health problems are susceptible to hypothermia at temperatures of 60-65° with less exposure time than a healthy person. Fatigue and intense mental concentration can impair your response to cold, and so can certain drugs. When core temperature drops below 90°, the situation is serious, and death may occur at about 80°.

When treating a hypothermia victim, take his or her temperature if you have a thermometer available. If there is no pulse or respiration, those of you who are trained start CPR. Bring the person into a warm place, wrap blankets around them, and put hot-water bottles or heating pads on the groin, head and neck, and sides of the chest where there is less fat (hopefully). Heat gets to the body quicker where there is less fat. It's important to warm the body slowly because as rewarming begins, heart rhythms may become irregular. Get the person to a hospital and don't let them go to sleep. Don't rub the skin, especially with snow.

Plan ahead for cold—it's a hot spot to be in if you aren't prepared.

TAC Safety Awards

Crew Chief Safety Award

SSGT RAYMOND R. MARSHALL is this month's winner of the Tactical Air Command Crew Chief Safety Award. Sergeant Marshall is a crew chief with the 1st Equipment Maintenance Squadron, 1st Tactical Fighter Wing, Langley Air Force Base, Virginia.

While working as crew chief on a CT-39A aircraft, Sergeant Marshall found that the nose gear tires were unevenly worn and exceeded tech data specifications. Normal procedures are to just remove and replace the tires. But Sergeant Marshall wasn't convinced that this tire wear was normal. So he investigated further and found that the aircraft's nosewheel bearings were worn beyond limits. Had the worn bearings gone undetected, steering the CT-39A at a high rate of speed during landing would be extremely difficult, and the airplane could veer off the runway.

Sergeant Marshall does not compromise safety to get the job done. In this instance, his attention to detail and persistence in finding the real prob-



SSgt Raymond R. Marshall

lem averted a potential accident. He has earned the Tactical Air Command Crew Chief Safety Award.

Individual Safety Award

SSGT DENISE C. KING is this month's winner of the Tactical Air Command Individual Safety Award. Sergeant King is the foreign object damage (FOD) monitor for the 479th Tactical Training Wing, Holloman Air Force Base, New Mexico. Sergeant King has been instrumental in lowering the wing's FOD rate well below the TAC standard.

Recently an AT-38B aircraft suffered FOD to both engines on its first flight after the depot had reskinned the engine intakes. An engineering deficiency resulted in seam separation in the intake, allowing internal residue to enter the engines. After a new skin was made and installed, Sergeant King entered the intakes to inspect the new skin and seams. It took 30 trips down the intakes before she would verify their structural soundness. She has also identified two high FOD potential areas on the AT-38 not previously recognized.

Sergeant King has written several articles and recently completed a sound-on-slide briefing on



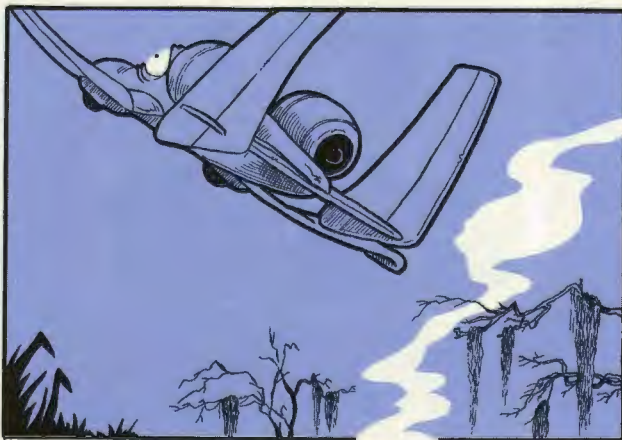
SSgt Denise C. King

FOD awareness training. Her identification and accurate analysis of problem areas, and her thorough follow-up actions have reduced the potential for damage to wing aircraft. Her technical knowledge and ability excel. She has earned the Individual Safety Award.

WEAPONS WORDS

THE WAYWARD HAND

The A-10 pilot was on his way to the gunnery range. Flying at 240 knots and 500 feet above the ground, he checked his position on the map, then placed the map down on the left console behind his elbow. Next, he reached forward to place his left hand near the clock so he'd be ready to reset it. While his hand was moving, the pilot was looking outside, checking his flight path. His left hand didn't land on the clock; instead it hit the emergency stores jettison button. Four TERS, loaded with three BDU-33s each, jettisoned from the airplane and fell into the swamp.

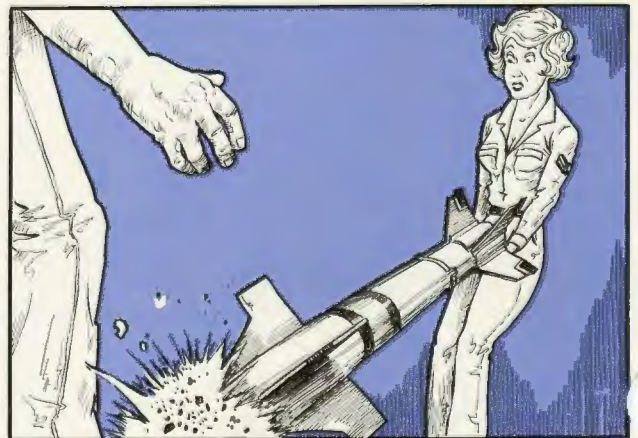


The pilot was inexperienced. It takes a while to get used to a cockpit. But even pilots experienced in an airplane can hit the wrong switch. We can't let our hands get disconnected from our minds.



TECH ORDER WARNING IGNORED

Six AIM-9E missiles on an MHU-141 trailer arrived in the storage area, where they needed to be offloaded. Two munitions systems specialists tried to do the job. They picked up the first missile, one holding the nose end of the missile and the other holding the tail. The one holding the tail lost her balance; and as the other tried to help, he lost his grip on the nose of the missile. The nose of the missile fell to the floor, shattering the guidance and control



ome. The seeker head was also broken.

This was the first time that either of the two munitions specialists had tried to offload AIM-9Es. If they had taken a look at the tech order, they'd have seen a warning that three people are needed to handle an assembled missile. Maybe if they had looked for a third person to help them, they might have found someone who'd done the job before. More experience could have helped; reading the tech order definitely would have helped.

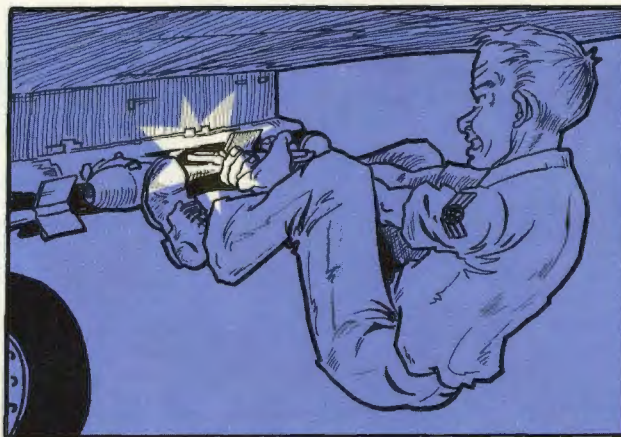
TEN PERCENT NEVER GET THE WORD

While deployed to work in an exercise, an F-4 unit ordered their practice bombs through the host unit. The deployed unit had been using BDU-33 D/B practice bombs for the last two years; but when they ordered bombs, they just asked for BDU-33s. The host unit was more familiar with the BDU-33 B/B, so that's what they ordered.

On the day that the F-4s were to begin flying with practice bombs, the unit discovered that the bombs were BDU-33 B/Bs and quickly set up a briefing to explain the differences in loading and arming. Most of the weapons troops were unfamiliar with the older model practice bombs. One crew didn't attend the briefing because they were already out on the flight line loading aircraft for the day's first sorties. Because this crew was also unfamiliar with the BDU-33 B/B, they didn't know that this model bomb is normally armed while the airplane is still on the parking ramp. The crew didn't arm the bombs.

The weapons crew with duty at the end of the runway (EOR) that day had to arm the bombs. The EOR crew had some difficulty pulling the safety pins. That evening the chief of the crew at EOR told the crew chief of the crew that loaded the bombs how hard it had been to pull the pins. Since the first crew was scheduled to work at EOR the next day, the crew chief who'd been out there suggested that they might need a pair of pliers to pull the pins.

So the next day, the first crew, the ones who had never been briefed on the differences in the B/B model, headed out to the end of the runway, taking along a pair of pliers. In the meantime, the crews that were loading the aircraft knew that the BDU-33 B/B could be armed on the ramp, so they pulled all the safety pins on the bombs before the airplanes taxied. When the first six airplanes arrived at EOR, the crew out there expected to have to pull pins. They found some pins to pull, and they pulled them. The pins were hard to get out, but they were



expecting that; that's why they had the pliers.

The first six aircraft took off. When they did, each airplane dropped six spotting charges and inertia tubes on the runway. The pins pulled by the EOR crew were cotter pins—the retaining pins for the spotting charges. Thirty-six spotting charges and inertia tubes had been dumped on the runway. Eventually, all but one spotting charge were found and turned over to explosives ordnance disposal.

It's a well-known maxim that ten percent never get the word. And Murphy's Law guarantees that that ten percent will be in the critical place at the critical time to insure that something goes wrong. To be sure, the cause here was a lack of communication. But shouldn't somebody at EOR have questioned whether they were doing it right? When in doubt, don't press on; stop, and find out the right answer.

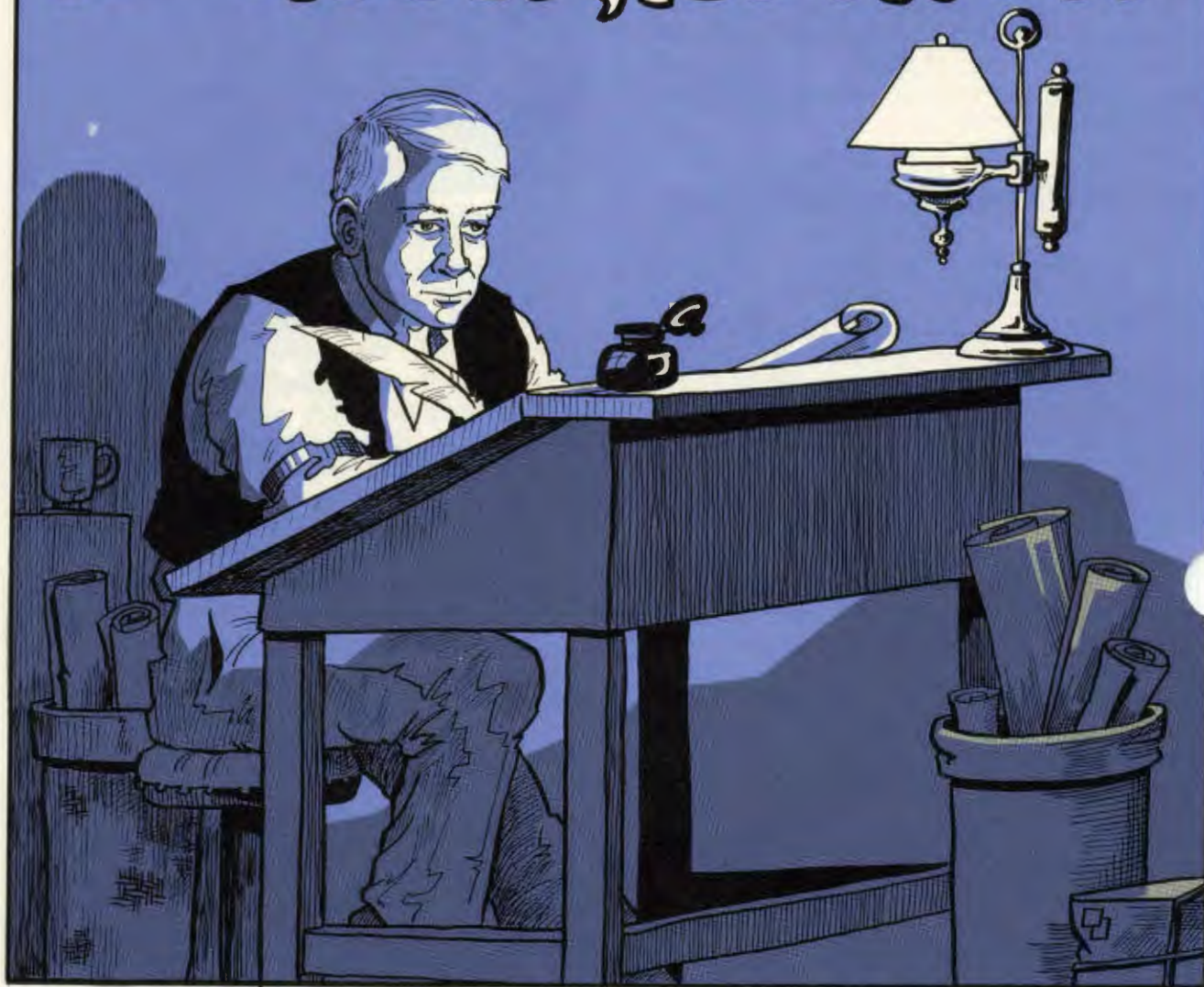
ONCE BURNED, TWICE SHY

At a base where we share some runway and operating space with another service, the "other guys" had an incident we can learn from. One of their aircraft had returned with a stuck flare. Without tech data, safety, EOD, or a note from mother, a senior NCO attempted to yank the hung flare free. It functioned as advertised and ignited in place. In an effort to avert disaster, the same ambitious NCO made a plane-saving grab, which, though successful, burned him quite seriously.

There's wisdom in the quip "If all else fails, read the directions." As we smugly think to ourselves, How could anyone be that careless? let's consider how close we've come to an accident through carelessness—our own or a workmate's. The guy with the burns is the example; he's not likely to do the same thing again. But each one of us is a potential cause or victim of a future mishap. It's up to us.

Courtesy 1st Lt Allan W. Muller
313 AD/SEW

AUTHOR, AUTHOR



We are eager to publish more articles from our readers in the field, but we sense that many of you potential authors are unclear about what kind of article *TAC Attack* is looking for.

The most important consideration is our purpose: we are a *safety* magazine. Pure publicity items should go to the public affairs office. The only exceptions are achievements directly related to safety which would teach or help motivate others. The term *safety* means different things to different people. In its widest sense it covers almost everything; any-

thing that improves our ability to do the mission improves safety. We have to be a bit more specific. When we look at an article, we ask ourselves whether printing the story will directly or indirectly help prevent mishaps. What's the purpose of the article? Sometimes it's simply a matter of emphasis. If you write an article on how to improve your bomb scores, it probably belongs in the *USAF Fighter Weapons Review*. But if you write an article telling how to improve range safety while at the same time getting better bomb scores, we'll print it.

(HOW YOU CAN WRITE FOR TAC ATTACK)

Another question we ask when we review an article is whether there is another medium, which our audience has access to, that the article is more suited for. The example above mentioned the *Fighter Weapons Review*, but there are many information media that our readers also see. We have suggested to some of our authors that their articles belonged in their specific aircraft's phase manuals. Any article that is very long and deals with specific techniques for one system probably is more suited for an instructional manual than *TAC Attack*.

On the other hand, we don't mean you have to be general and abstract. You should use concrete examples to illustrate and explain your point. But a feature article should normally be more concerned with teaching general principles that apply to a number of our readers than with teaching specific techniques that apply only to a few readers. We'll print articles on specific techniques if they are short and to the point—one or two pages.

The opposite extreme, of course, is the story that is so general it doesn't say anything: the "Be safe" type of story. Those stories don't teach or motivate; they just preach to the choir. And they usually sound preachy. It's not that we expect every story to reveal some new undiscovered truth about safety. Most of the lessons have already been learned. But a good story offers a fresh insight into or a new application of the old principles.

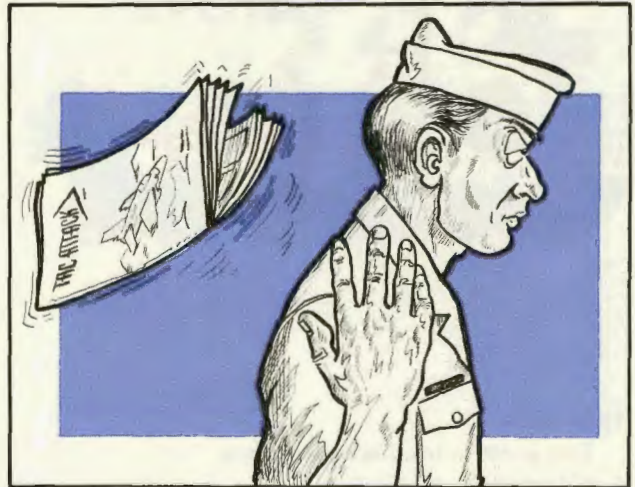
Our most effective stories have been based on personal experience. Those stories bring it all back home. When a writer shows how the old lessons of safety actually affected him or her, we as readers pause to think, *Maybe it could even happen to me*. That's when the article has done its job, when people take it personally and act on it.

The idea of the reader taking it personally brings up another point. Our decision to publish is based not only on content but also on style. We have to ask whether the article will be read. Readership of our magazine is voluntary. So the style of writing must draw the reader's attention.

What does that take? Well, everyone has a different opinion of what's interesting; but mostly it's what you and the people you work with would take time to read. Because of differing tastes and interests, we don't expect our average reader to read everything in the magazine. But everything in the magazine

should be of interest to some part of our audience. And the style should not turn off the audience it's trying to attract.

Would you read an article that lectured you? If you're like most of us, you get sick of an article with



a when-will-you guys-shape-up tone. If the attitude of the writer is that we're all in this together so let's share what I've learned, then we might be willing to listen to what the writer has to say.

When we talk about style in writing, we don't mean the rules of grammar. We can fix grammatical errors easily enough. But we mean the tone and the attitude of the author. We can't fix that because it's imbedded in the way the story is written.

Style should vary with the audience. The style you would use in a term paper or a staff study is out of place in *TAC Attack*. The information in a term paper or staff study might make a very good article, but first it must be completely rewritten and aimed at our audience.

You may have noticed that we publish a variety of styles. The rule of thumb is that the style should be as simple as the subject matter allows. If that seems too simple, maybe the subject matter needs some work.

What we're really saying is that writing for *TAC Attack* is easier than it seems. Write in your normal conversational style about something that you know well and that could help someone else do their job more safely. Write the article in a style that you would appreciate, and we'll publish it. ➔



Dear Editor

This letter is in reference to your "More Bad Feelings" article in the "TAC Tips" section of the September 1982 issue. It describes an F-4E incident where the pilot lands above his computed approach speed, imagines he has antiskid failure, paddles it off, and blows both tires.

The pilot calculated a 17-unit approach speed of 167 knots, then added 10 knots for gusts (winds at 11 knots

gusting to 23), for a total of 180. Probably rounding ever upward for mom and the kids.

Your article states his approach speed should have been 174 knots. I assume this figure was obtained by adding half of the gust factor. Adding half the gust factor is only a player for determining the effective wind velocity, not approach speeds.

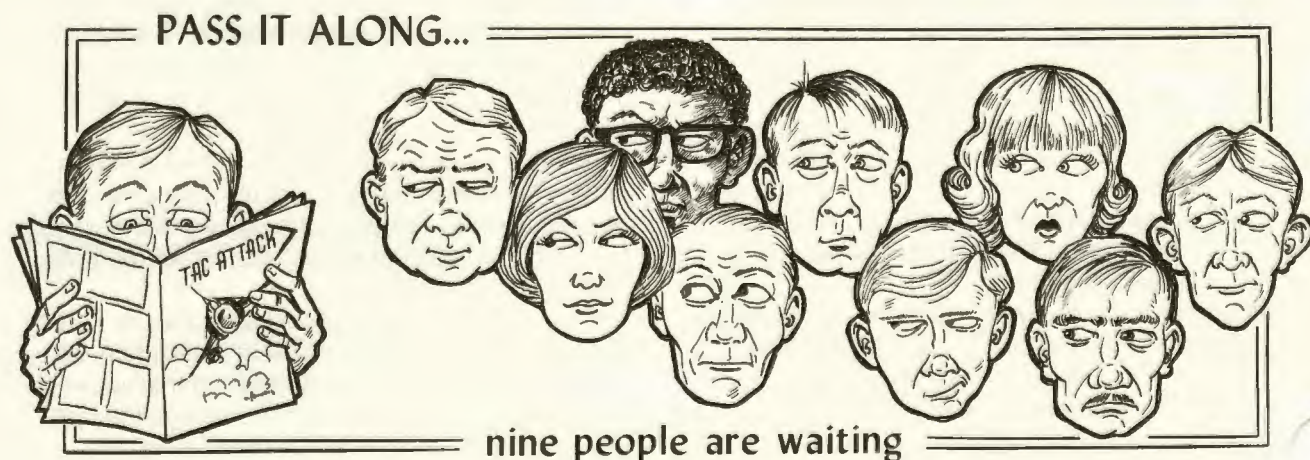
The F-4E Dash One states: "The optimum indicated AOA for approach is 19.2 units, and is adequate for all gross weight and normal slat flap configurations . . . When landing in gusty or crosswind conditions, . . . a 17-unit AOA approach is recommended." Period! It sounds like the pilot should have flown the 167 knot 17-unit approach speed, then "transition to ON SPEED and a flared landing . . ."

Gregory W. (Vis) Visyak, Captain, USAF
35 TFW/DOV, George AFB, CA

Dear Captain Visyak

Our estimate of approach speed was what the unit involved stated his approach speed should have been. Apparently, this unit adds the gust factor to the 17-unit approach speed. As you point out, the Dash One procedure of flying 17 units in gusts already incorporates the gust factor. Adding another gust factor should be unnecessary, or else the Dash One should be changed. Thank you for pointing out the error.

However, the primary point of the article is still valid; whichever speed was correct, the pilot attempted to "feel" braking effectiveness at an airspeed which made it impossible. It's the turn-off-the-antiskid-and-blow-the-tires syndrome that we're trying to eliminate.
ED



TAC TALLY



CLASS A MISHAPS
AIRCREW FATALITIES
TOTAL EJECTIONS
SUCCESSFUL EJECTIONS

TAC		
SEP	THRU SEP	
	1982	1981
1	23	29
2	14	17
0	20	29
0	17	22

ANG		
SEP	THRU SEP	
	1982	1981
0	5	5
0	2	2
0	5	1
0	4	1

AFR		
SEP	THRU SEP	
	1982	1981
0	1	1
0	0	1
0	2	1
0	2	0

TAC's TOP 5 thru SEPTEMBER '82



TAC FTR/RECCE	
class A mishap-free months	
48	1 TFW
35	49 TFW
34	355 TTW
25	347 TFW
22	354 TFW

TAC AIR DEFENSE	
class A mishap-free months	
116	57 FIS
69	5 FIS
66	48 FIS
25	318 FIS
16	87 FIS

TAC-GAINED FTR/RECCE	
class A mishap-free months	
125	188 TFG (ANG)
117	138 TFG (ANG)
116	917 TFG (AFR)
113	116 TFW (ANG)
103	434 TFW (AFR)

TAC-GAINED AIR DEFENSE	
class A mishap-free months	
103	102 FIW
99	177 FIG
65	125 FIG
48	119 FIG & 142 FIG
38	144 FIW

TAC/GAINED Other Units	
class A mishap-free months	
158	182 TASG (ANG)
151	193 ECS (ANG)
146	26 ADS
142	110 TASG (ANG)
138	USAF TAWC

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

TAC	1982	7.8	5.7	5.9	5.2	5.9	5.7	5.1	4.7	4.4			
	1981	4.0	3.0	3.2	5.6	6.0	5.9	6.3	6.2	6.0			
ANG	1982	0.0	2.7	3.2	3.4	3.6	2.9	3.1	2.7	2.4			
	1981	9.3	4.8	4.6	3.3	2.6	2.2	1.8	1.6	2.4			
AFR	1982	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	3.2			
	1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.4			

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

US GOVERNMENT PRINTING OFFICE: 1982-539-060/5

FLEAGLE

