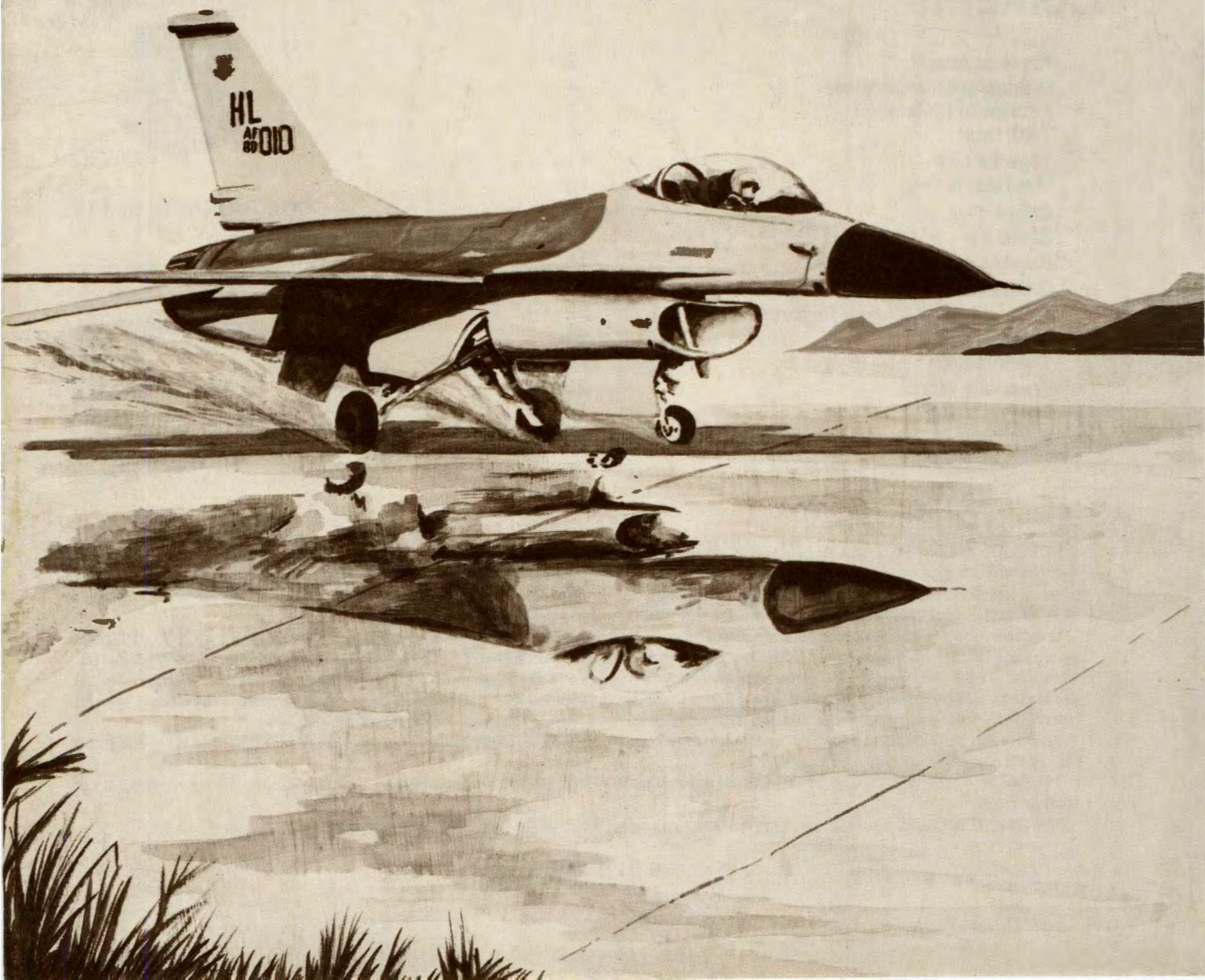
TAC ATTACK

JULY 1981



JUL

READINESS IS OUR PROFESSION

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Angle of Attack

It's July, and that means Independence Day, summer fun, and vacations for many. We want this issue of TAC ATTACK to help you enjoy the holidays and summer activities.

A lot of us celebrate the 4th of July with firecrackers. If you do, you'll want to read "Fireworks" in *Down to Earth*. And while you're there, read up on sunburn in "Here Comes the Sun." Sometimes we spend the 5th of July suffering from the sunburn we got on the 4th.

Summertime is also vacation time for *Ben* and *Martha*. It's a dangerous time for auto mishaps, especially when we push ourselves too hard. By slowing down and relaxing, we can enjoy our vacations (unlike poor Ben).

Summer showers mean wet runways, so pilots will want to review "Hydroplaning." All of us are subject to overexertion in the summer heat, so it's worth reading "The Heat Is On."

Other problems aren't tied to the seasons: "Managing Emergencies" is something fliers must be ready for all the time. And the classic "Parable of the Blind Men and the Elephant" applies to all of us with our own blind spots. "Fleagle" shows that one of those blind spots can be our communication of the "big picture."

In our business, we talk about our mistakes so much that sometimes we forget why. In "Neighborhood Mishap Reports," we are reminded that everyone makes mistakes, but we are trying to learn from ours.

So let's learn and enjoy the summer.

Richard K. Ely

RICHARD K. ELY, Colonel, USAF
Chief of Safety

MANAGING EMERGENCIES

By Capt Wayne S. Dodds
F-4 WSO, 21 TFS
George AFB, CA

The rare occurrence of serious emergencies in jet aircraft operations, coupled with the sheer number of technological irregularities covered in the emergency procedures section of our flight manuals, often gives crewmembers a false sense of security about preparedness. Many fail to realize that emergencies don't always follow the printed scenario, that they may not be able to consult a checklist. That is why BOLD FACE was invented. Moreover, the way the decision making process is affected by a real emergency can't be simulated. There is no way to predict how the sudden demands of a life threatening emergency will cripple the ability of a crew to manage adversity.

Over the years we have seen some spectacular saves by crews who managed to bring an aircraft and themselves back to safety. Witness TAC ATTACK'S Aircrew of Distinction or FLYING SAFETY'S Well Done Award. It is not customary to question the decisions of a crew who made it, even in cases where the airworthiness of the plane could not be guaranteed. Therefore, the thinness of the string that held things together is rarely discussed.

Decision Making

Decision making implies having a choice. The manner in which we perceive a choice is governed by the quality of the information and the quality of our interpretation of that information. The problem with some emergencies is that they don't allow the luxury of a by-the-book approach. The information may be incomplete or misleading. The phase of operation where the emergency occurs may only leave time for an immediate reaction, governed by a sixth sense acquired through training and experience.

The interesting part of emergencies requiring an immediate, irreversible decision is that they are quite often handled better than those that leave time for a change of plans. The go/no-go decision during a takeoff roll is a case in point. Most of the data is cranked

into this decision long before step time. The principle variables are the nature of the emergency and the crew's evaluation and response to it. Considering the criticality of the time element, the immediate no-go decision of a crew who has reason to doubt the air worthiness of their machine has always been respected and rightfully so.

The conservative approach seems the best approach. An aircraft was totally destroyed when the crew continued with a night takeoff despite the blaring of a cockpit warning horn. The crew assumed they could find the problem; they couldn't, and 5 people died.

In another case, a crew successfully aborted a takeoff when they heard a large noise and the plane started to list. A disintegrating wheel rim had ripped a hole in a fuel tank and ignited the fuel. Some interesting questions would have been raised had the timing of the incident been different:

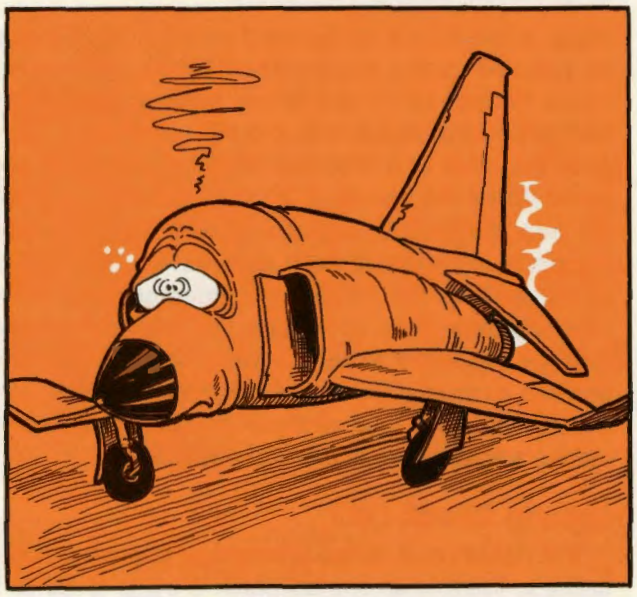
- What were the immediate indications of the problem available to the crew?
- Could they have assessed the nature and seriousness of the emergency from the cockpit?
- Could the disabling of the fire warning system have given the false sense of security?
- How long would the plane have held together before the wing fell off?

Cockpit Confusion

An accident some time ago illustrates how easily the response to a "standard" emergency can be disrupted by poor crew coordination. The aircrew experienced a hard over nose gear steering soon after starting their formation takeoff roll. They initiated the abort procedure. Momentum caused the aircraft to depart the runway still in afterburner. Although the abort procedures were undoubtedly called for, the throttles were not retarded to idle. Consider a light on the star one second and 90° away the next, and how that would affect the crew. The plane burst into flames when an external fuel tank split open. The crew did not survive the accident. The reason the crew did not survive is a prime example of how crew coordination can breakdown in a life and death situation. Evidently a ground egress was called for after the plane stopped. The WSO decided that the only way to survive was to eject because flames surrounded the cockpit. No one knows exactly what was said over the intercom, but it couldn't have been very enlightening because the pilot was killed when he was ejected from the aircraft unstrapped, preparing for his ground egress. It is vitally important that the crew follow the prebriefed procedures or let each other know before taking unbriefed action.

The Gift of Time

By their very nature, inflight emergencies tend to allow more time for analysis and corrective action. Last



year an F-4 experienced a multitude of seemingly unrelated symptoms during flight. The symptoms included illuminating fire lights, loss of generators, etc. The crew correctly analyzed the situation and concluded they had bleed air duct failure. The crew returned to their home base and successfully landed the airplane despite extensive damage. They took off in VMC conditions. Would they have been able to analyze the situation as quickly if they had taken off in IMC conditions? Hard to say.

Incidents involving smoke or fire should be treated as critical from the very beginning. When the origin of smoke or fire is unknown or when checklist actions fail to identify the problem, go 100% oxygen and land the plane as soon as possible. Don't assume you will find the source of the smoke or fire and extinguish it.

The Pilot's Bag of Tricks

Misinterpretation of unusual instruments can quickly lead to a critical situation. For instance, an aircrew was unable to regain control of their aircraft after stalling it at about 24,000 feet while attempting to reduce an abnormally high rate of climb and high airspeed. The crew attributed the readings to light gross weight and weather conditions. Actually, the plane was climbing through icing conditions and the crew forgot to turn the pilot heat on. There were no indications that anyone knew the true nature of the problem. This is disturbing since every pilot has been taught to recognize malfunctions of the pitot-static systems. It is one of the pieces of knowledge that should be in every pilot's bag of

MANAGING EMERGENCIES

tricks. While there is no standard inventory for this bag, its size and quality are governed by our own experiences as well as by our formal training. Recovering from unusual attitudes falls into the same class. Consider the case of a pilot that went lost wingman and broke out of the clouds at 27,000 feet MSL and still ran into the ground. With the advent of single seat fighters it is important each pilot have a full bag of tricks. It does not require an emergency of monumental proportions to reduce the margin between success and failure to zero. A while ago, another pilot flew into a mountain while executing lost wingman procedures at night. True safety in aviation continues to require situation awareness and intelligence.

Ground Check OK?

It is not unusual for an emergency to start with our failure to listen to an aircraft which is trying to tell us it has a problem. The emergencies often start with the placebos *Ground Check OK* or *CND* or *Entered into 781*. A couple of years ago, an aircrew had to make a high speed abort when both engines compressor stalled and overheated. A few days earlier, another aircrew had written up the engine for compressor stalling in the flight envelope. Maintenance could not find anything wrong with it so they signed off the write up, *CND*. The cost of this incident—two engines and a very shook aircrew.

Compromises with regard to the minimum equipment list fall into the same category. Consider the predicament of a crew that found itself in IMC weather conditions with no electrical power. As the result of a series of incidents after takeoff, they lost all power and hence all attitude references. The resulting crash was inevitable. Because of this incident, an independent standby attitude reference became mandatory for this type aircraft.

Don't accept an aircraft when the reliability of a critical system cannot be assured. It takes knowledge to refuse an airplane, and that is one of the prerequisites of being a good fighter pilot.

The need to be reminded of our vulnerability to emergency situations has a parallel in our need to suffer booster shots to maintain immunity against certain diseases. Unfortunately, too often we expect to maintain mishap immunity by keeping track of those emergencies that result in publicized accidents. However, almost all cases of unusual incidents, no matter how small, demonstrate the fallibility of the human element in aviation. By giving emergency awareness the level of attention it demands, we encourage the worldwide sharing of experiences that should form the basis of our preparedness for uncommon challenges.

Capt Wayne S. Dodds is this month's FLEAGLE T-Shirt Winner

This article is adapted from an article by Geral M. Bruggink, Deputy Director of the Bureau of Accident Investigation, NTSB, that appeared first in Pan Am's Cross Check.

SAFETY PEOPLE IN TAC

PROMOTIONS

Maj Ray Blewett to Lieutenant Colonel
Maj Jim Thames to Lieutenant Colonel
Maj Wayne Skora to Lieutenant Colonel
Capt Ernie Armstrong to Major
Capt Henry McPhillips to Major
Capt Wade Paton to Major
Capt Steven Wall to Major
SMSgt Jim Paupard to Chief Master Sergeant
SMSgt Andy Webb to Chief Master Sergeant
Sgt Gordon Duke to Staff Sergeant
Sgt Linda VanAlen to Staff Sergeant
SrA George Bride to Sergeant
SrA Cindy Mount to Sergeant
A1C Lori Curry to Senior Airman

AIRCREW OF DISTINCTION

Capt James F. Burho
58 TFS, 33 TFW
Eglin AFB, FL

On 19 March 1981, Capt James F. Burho was flying a functional check flight (FCF) on an F-15A aircraft. During checks of the autopilot, the airplane began to oscillate slightly in pitch. During a subsequent check of the pitch augmentation system, the aircraft pitched up violently, requiring Captain Burho to react quickly with forward stick to regain control. As the pitch oscillations continued, Captain Burho noted fluctuations in the pitch ratio gage, so he selected emergency on the ratio switch; but the oscillations remained. Calling off the FCF, he began to return to base, asking another F-15 to join him.

As Captain Burho slowed to 250 knots, the oscillations increased to 5 degrees and became more difficult to control or dampen. He tried to reset the pitch ratio switch, but this worsened the oscillations, so he put it back to emergency. When he lowered the gear and flaps for a controllability check, the pitch oscillations again increased: he determined that the airplane was uncontrollable below 230 knots. After raising the flaps, he decided to make a practice approach at 250 knots.

When he found it extremely difficult to control the pitch on that approach, Captain Burho began a second approach, increasing his airspeed to 270 knots. This time, as he slowed slightly approaching the runway threshold, the airplane pitched up and down violently; he went around using full afterburner. He flew a third practice approach to verify the need for a minimum approach speed of 260 knots. On the fourth approach, fighting oscillations all the time, Captain Burho landed the aircraft at 260 knots in a nearly three-point attitude. On the runway, he counteracted drift caused by gusting crosswinds and managed to slow the F-15 to 130 knots before engaging the departure-end arresting gear.

Captain Burho's superb airmanship and determination saved a valuable aircraft and possibly prevented injury or loss of life. He has earned the title of Tactical Air Command Aircrew of Distinction.

TAC TIPS

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

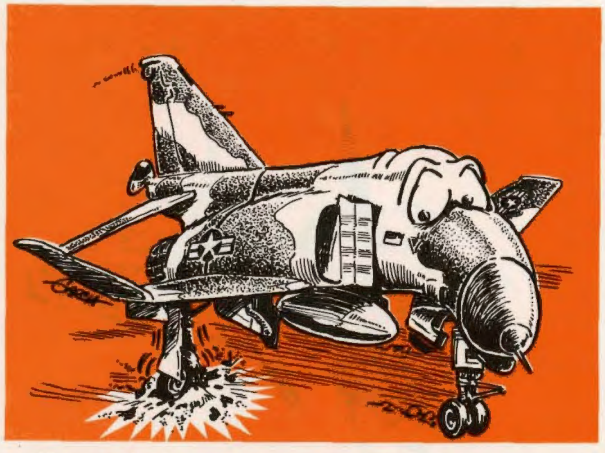
Like a dog that returns to its vomit
Is a fool who repeats his folly.
—Proverbs 26:11

write up those tires

Did you know you're supposed to write up tires for unusual stress? We hadn't thought of it either, but it makes sense. A recent incident points that out.

During an active air defense scramble, the F-4 got as far as runway lineup when the steps to the boarding ladder were discovered out. The aircraft was taxied back to the alert pad to have the steps pushed in. Then the aircrew taxied back out and made a rolling takeoff. This running around was done at higher than normal taxi speeds and at a gross weight of 57,000 pounds.

Two sorties later, this same aircraft ground aborted during pretakeoff checks. As it taxied down the runway, its right main tire blew out.



It's not that no one checked the tires; the maintenance crew on the alert pad visually checked the tires when the aircraft returned from its mission. But the tech data for tires says that the wheel and tire assembly must be removed to make a thorough check when tires have suffered greater than normal stresses. That thorough inspection won't get done unless the tire stress is written up in the forms.

That's where we come in. As aircrews, we're the ones who should normally enter the discrepancy in the forms. We owe it to the guys who fly the plane after us.

hot start

The T-bird was on a functional check flight (FCF). The front seat pilot was getting recurrent in FCFs with an instructor in the back seat. Beginning the emergency landing gear check, the pilot noticed the airspeed was a little too high; so he pulled the throttle back while increasing the aircraft pitch attitude. As the airspeed dropped, he went ahead with the gear extension. After returning the emergency hydraulic pump switch to off, he noticed the nose gear indicated unsafe. Believing he had a gear malfunction, he lowered the landing gear handle to recycle the system; that's when he noticed he had lost aileron boost. He checked his instruments: airspeed was 170 knots; altitude, 15,000 feet; EGT, 90 degrees; RPM, 6 percent; and fuel pressure, 10–20 psi. The pilot realized he had flamed out.

He found that the throttle was actually in cutoff instead of idle. He raised the gear handle, moved the throttle up to idle, and activated the gangstart switch. The engine began to wind up. The EGT rose to 200 degrees, hesitated momentarily, then continued to rise. As the EGT passed 900 degrees, the pilot pulled the throttle back into cutoff. The EGT peaked at 1,000 degrees and then decreased as the engine reached idle RPM. He brought the throttle back up to idle and returned to normal fuel. With the engine now responding normally, he brought the airplane back home, declaring an emergency and landing out of a precautionary pattern.

After he landed, investigators found that the throttle stop plate was worn on that shoulder which provides the stop between idle and cutoff. A vigorous pull could move the throttle around the idle stop into cutoff. That explained the flameout, but not the hot start.

When asked about the hot start, the engineers at the logistics center weren't surprised. They said at minimum airstart parameters (6 percent RPM) an overtemp is very likely with the throttle in idle. The idle position can provide fuel from the emergency fuel control in too large a volume for the air available at low RPM. When time permits, using the cutoff position of the throttle for gangstart will give a cooler start because it uses the starting fuel control instead of the emergency fuel control.

Another point was brought out: when the pilot first analyzed the problem, he raised the gear handle. That put an additional load on the engine since the hydraulic system was attempting to raise the gear while the engine was starting. The additional load may have contributed to the overtemp.

By the way, finesse in throttle positioning during an airstart isn't limited to the venerable T-bird. In our newest fighter, the F-16, throttle position during airstart in the backup fuel control (BUC) mode is just as critical. It pays us all to know the fine points of airstarting our machines.

the runaway radio

During a 45 degree dive in an 0–2, the pilot felt something strike the back of his seat. It was the FM radio, which had gotten loose from its rack and floated forward. That's a good reason to wear a helmet in the 0–2. Who knows when your own radios might attack you?

no 90-pound weaklings

On recovery after a defensive maneuvers mission, the RF-4 suddenly and unexpectedly pitched up. The pilot in the front seat returned the aircraft to level flight with brute force. At 250 knots, it took some forty pounds of forward pressure to hold the aircraft level. Attempting to trim nose down didn't work from either cockpit. Pulling the stabilator feel trim actuator and trying the autopilot didn't help either. So the front seater and the back seater took turns flying the approach. It took almost half an hour to get it on the ground. The problem turned out to be a short in the trim actuator relay panel.

These two were tired after less than a half hour. Can you imagine the same thing happening on an ocean crossing? Nobody would dare kick sand in your face if you made it through that.

hypoxia revisited

That T-bird hypoxia incident we wrote about in April was more insidious than we first thought. We thought that the pilot had overlooked part of his oxygen check; but, in fact, he had thoroughly checked his equipment on the ground and in the air. That little ball of plastic inside his oxygen hose didn't block his oxygen until he was at altitude. Then the plastic got caught in the hose at the quick disconnect. It allowed some oxygen to flow, but not enough.

The incident pilot made five good checks of his oxygen system before the plastic blocked his oxygen. He continued to breathe, but he wasn't getting enough oxygen. Fortunately, he checked the blinker on his regulator and discovered the problem because it was no longer blinking.

So, it looks like good preflight and climb checks won't reveal every problem. Even if the system has been working well, don't take it for granted. If you find your oxygen system acting strangely, treat it as a most serious emergency and get oxygen fast. Murphy doesn't always play fair.

TAC TIPS

an old trap returns

An old problem with oxygen regulators has resurfaced. In this case, a flight examiner in the rear seat of an F-4E in another command experienced mild hypoxia symptoms at 31,000 feet. The cabin pressure altitude was 16,000 feet. He checked the switches on the regulator and they seemed OK. He went to 100% oxygen, but could get no flow. So he pulled the "green apple" on his bailout bottle, and the hypoxia symptoms began to clear. When he then rechecked the regulator, he found the on/off switch in the off position.

Both the pilot and the crew chief had to miss checklist items for the regulator to have been off. It's supposed to be safety wired on. The reason it should be safety wired on is that some regulators, like this one, allow you to breathe normally even though the supply switch is off. But you aren't getting oxygen; you're getting ambient air from the cockpit. The newer model regulator (CRU-73/A) restricts your breathing when the oxygen supply lever is off. On the new regulators, however, it is possible for the oxygen supply lever to stop in an intermediate position. So, regardless of the type regulator, we must physically check the supply lever all the way on.

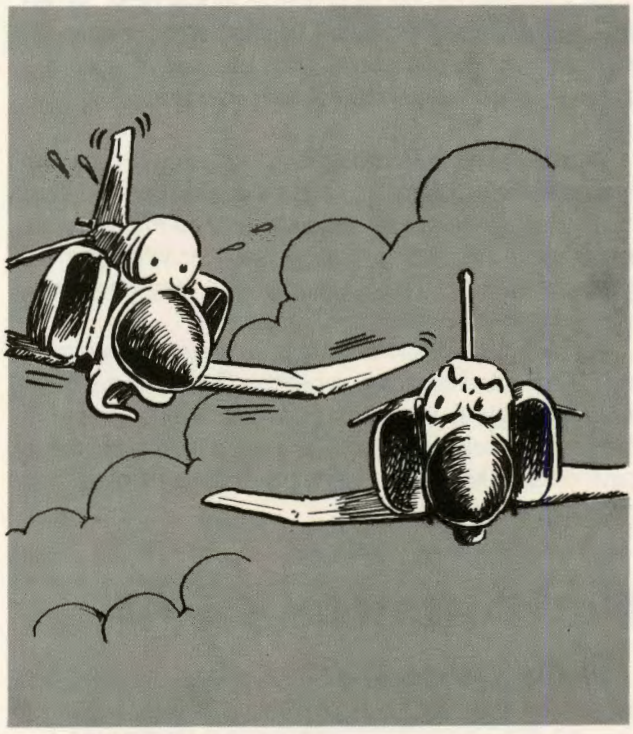
skill or luck?

During their checks before takeoff, the F-4 aircrew felt an unusually hard thump when moving the control stick full aft. They asked for a flight control specialist to assess the problem. The specialist came out and told the crew it was normal to have "resonant feeling" when the stabilator came to its command position during rapid stick movement. The aircrew's opinion was, Thank you very much, but we're going to abort anyway. The thump just didn't feel normal to them.

Troubleshooters found that the stabilator was reaching the full down position before the stick was all the way to the aft stop. The power control cylinder was moving past its permitted travel and was bottoming out against the cylinder housing. Further investigation showed that the control cylinder rod was almost completely backed out of the cylinder. It had only three threads still holding it in. When the rod came out, the result would be complete loss of pitch control!

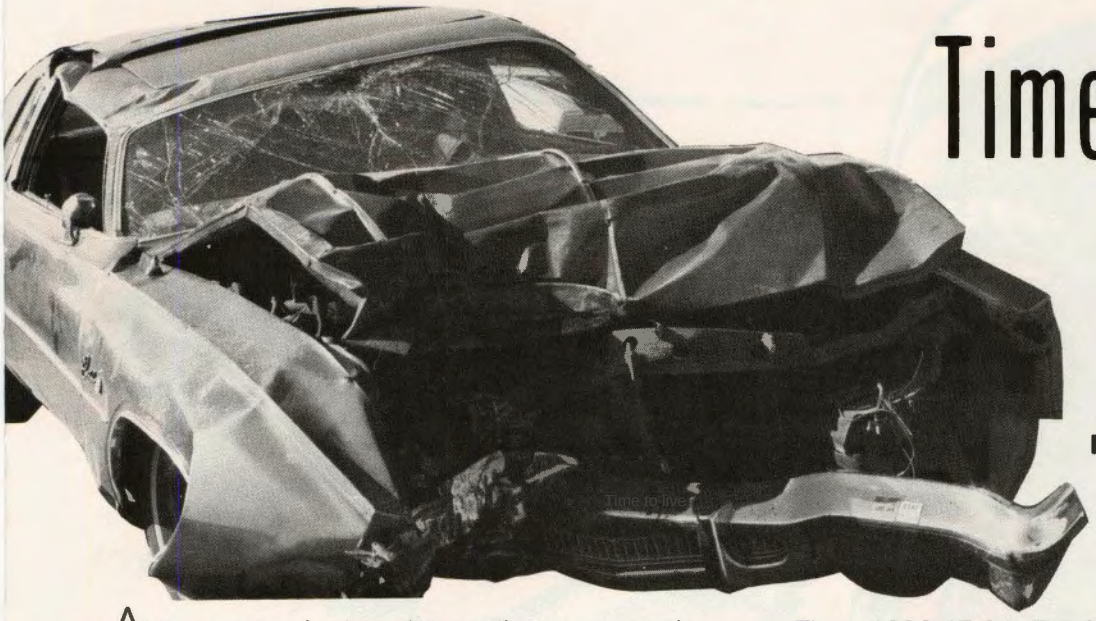
The investigation proved the instincts of the aircrew were right. Their good sense prevented a major mishap. That's the way a flight control problem on the ground should be dealt with. But there are always those who'd rather trust to luck:

Another F-4 crew found a problem during their flight control checks after engine start. The rudder failed part of the yaw stab aug check. When they tried it again, it worked. They went ahead and took the airplane for flight.



During gear and flap retraction on a formation takeoff, the aircraft suddenly yawed toward the lead aircraft. The pilot got it under control without hitting his leader; but when he tried to roll out, he found he couldn't depress the left rudder pedal. Then the nose of the aircraft began to wander. The aircrew disengaged the yaw stab aug and pulled the aileron-rudder-interconnect circuit breaker. Then they began dumping fuel in preparation for an emergency landing. After 5 minutes of fuel dumping, the aircraft rolled left with a nose slice. The pilot unloaded and rolled wings level; then the airplane began wing rocking. The pilot did a controllability check and then made a successful straight-in approach and landing.

So there you have two different responses to a flight control discrepancy found before flight. One used skill and judgment to avoid a mishap, the other used luck.. Which crew best represents you? How do you know when your luck is going to run out?



Time to Live

By Lt Col Charlie Huff
Chief of Safety, 832 AD

At the corner of a busy intersection, a young airman loses control of his sleek, bright Chrysler Cordoba and hits a power pole dead center. The impact snaps the giant pole into splinters, severing high-voltage power lines. The time is 1006:47.

Time, 1006:47:01. The front bumper and chrome trim of the grillwork collapse. Slivers of steel penetrate the huge pole to a depth of 1½ inches.

Time, 1006:47:02. The hood crumples as it rises, smashing into the windshield. Spinning rear wheels leave the ground, while the fenders come into contact with the pole, forcing the rear of the hood out over the front doors. A deceleration force goes through the frame to the seat belt mounts and then through the 2-inch nylon web safety belts and harness surrounding the now petrified driver.

While the belts are being forced into the clothing and flesh of the driver, his knees and head snap viciously forward, then back. Were the driver not in a state of shock, the pain of the whipping motion would bring forth a tremendous scream of pain. This driver's injuries are now over—he's bruised and shocked and very sore, but he is alive and will not lose a day of work.

The heavy structural members of the car begin to act as a brake two-tenths of a second after initial impact. If the driver were sitting on the seatbelts rather than buckled in, the body would continue forward, unrestrained, at the vehicle's original speed, snapping legs at the knee joints.

Time, 1006:47:03. If not strapped in, the driver's body would slide off the seat, broken knees pressing against the dashboard. The steel and plastic steering wheel would bend under the force of his death grip. His head would now be near the sunvisor, chest above the steering column.

Time, 1006:47:04. The front 36 inches of the car have been demolished, but the rear end is still traveling at an estimated 35 miles per hour. The driver, tightly belted in, is slowed to approximately 20 miles per hour. The ½-ton engine block crunches into the pole, while the rear of the car, like a bucking bronco, rises high enough to be seen from directly in front of the car.

Time, 1006:47:05. The driver's fear-frozen hands bend the steering column into an almost horizontal position. Were it not for the safety belts, he would be impaled on the steering shaft. Jagged steel would puncture his lungs and arteries, causing internal and external bleeding.

Time, 1006:47:06. The chassis of the Cordoba bends in the middle, and floor bolts snap like small screws. At this point, an unbelted driver's head would smash into the windshield, bringing his body to an abrupt stop—from 35 miles per hour to complete stop in one-tenth of a second, a force of approximately 25 G's. During that one-tenth of a second, the rear of the car begins its downward fall, rear tires spinning into the dirt.

Time, 1006:47:07. By this time, the entire writhing body of the car has been transformed from modern sleek lines to a smashed jumble of hinges, doors, broken glass, and blown tires.

If he were not wearing seatbelts, the young airman would now be dead or dying. As it is, the young man is treated at the emergency room, kept overnight, and released to go back to work the next duty day.

It only takes seven-tenths of a second to die—or to get bruised around the hips and across the chest where those lifesaving belts and harnesses fit. ➢

Adapted from the (Luke AFB) Tally Ho

THE HEA

Sweat trickled into Rocky's eyes as he squinted, trying to spot the captain in the bright sun. He saw the captain, distorted by heat waves from the desert floor, climbing a black mound of lava rock. The captain was getting ready to control an air strike, while Rocky stayed with the jeep to keep in radio contact with the air support operations center (ASOC) forty miles away. The captain carried a portable radio to talk to the fighters in the strike flight.

Rocky lifted his helmet and wiped the sweat from his forehead. He was hot and tired. He and the captain had been in the desert for three days. The combat gear they wore added to the heat and fatigue. Just thinking about it made Rocky thirstier, so he drew himself a drink of cold water out of the jug in the jeep's trailer.

The crackling of his radios told Rocky the fighters were checking in. As he waited for the captain to return the fighters' call, he pulled out his log and clipboard to copy the information. The radio crackled again as the fighters called the captain. No answer. The fighters called again, beginning to sound impatient. Rocky looked toward the lava mound where he'd last seen the captain standing, but the captain wasn't there. Rocky picked up a pair of binoculars and searched the mound; he saw the captain lying face down on the lava rock.

Rocky headed toward the captain in his jeep. He stopped the jeep at the base of the hill and began climbing. About three-quarters of the way up, he reached the captain, who was still lying there, unconscious. Rocky looked him over carefully: he wasn't bleeding. Rocky turned him over gently. The captain's face was hot but very dry, and he wasn't sweating at all. His breathing seemed okay. When Rocky checked his pulse it was full, strong, and pounding. What was wrong with the captain?

The captain was suffering from heatstroke. To prevent brain damage or death, Rocky had to quickly lower the captain's body temperature somehow. In these circumstances, he could take him down to the jeep to use the only shade available. Then he might strip the captain's clothes off and lay him down with his head and shoulders slightly raised. Since immersion in ice water would be impossible, Rocky could cover the captain with sheets dipped in cold water; for instance, he could use his nylon signal panels dipped in the drinking water. If there was any ice in the water, he could place a piece of ice in each of the captain's armpits. Rocky would need to do everything he could to lower the captain's temperature until medical help arrived. Heatstroke is deadly.

Heatstroke is the most severe type of heat stress. In all heat stress, the body is attempting to maintain normal temperature in a hot environment; and a large part of its circulation is directed to the skin in order to radiate heat from the surface and to support the increased activity of the sweat glands. As the body then exerts itself in the heat, the need for increased circulation to the skin, combined with the need for circulation to the muscles and brain, exceeds the capability of the body: the person collapses. In the case of Rocky's captain, the collapse was heatstroke, in which the entire sweating mechanism fails and the body temperature skyrockets. The key indicator is the lack of sweating in the victim. Drastic measures are required to cool the body.

A more common type of heat collapse is heat exhaustion. Someone who has collapsed in the heat and is perspiring freely has heat exhaustion. The sweating rules out heatstroke, even though the skin temperature may be high. The victim should be moved to a cool place and treated for shock. Normally, he'll recover consciousness quickly. When he's conscious, he can drink water with about one-half teaspoon of salt added per glass.

Besides collapse, working in the heat can also bring about dehydration and heat cramps. The cramps result from loss of salt in the body caused by sweating. Dehydration is likely because the body's cooling mechanism uses up water. When we first feel thirsty, we may already be a quart low. Dehydration is especially likely in a desert climate where the dry air allows greater evaporation. That's why we feel cooler in 100-degree heat in Tucson than we do in 100-degree heat in Southeast Asia. The lower humidity lets the body's evaporative cooling work better. But it also means we are losing water faster.

So, the summer heat we looked forward to all winter brings dangers with it. We exert ourselves more, both on and off duty. The days are longer, and we cram more activity in them. The flight schedulers have also noticed the extra daylight, so they schedule more flying, which means more maintenance and support. We work and play longer, harder days in the heat. That can cause heat stress.

The answer is prevention, to watch ourselves and our friends for signs of heat stress and then to get out of the heat before it becomes serious. We should also limit our exposure to short periods in the heat until we build up more tolerance to it. We certainly can't spend all week in an air-conditioned office and then work or play all Saturday in the sun. Instead, we should build up our heat tolerance with light exercise outside regularly. When we are in the heat, we should dress sensibly in loose, light clothes; and we need to drink plenty of water. Some other drinks like coffee, tea, and beer cause us to eliminate more water than we take in. That requires us to drink even more water.

But the essential thing is to listen to our body when it gives us warnings. We know when we're too hot and too tired; sometimes we just ignore the facts. Ignoring the warnings gets us into heat stress. Then we better hope there's a Rocky around.

Don't count on that. Stay cool.

Medical information extracted from "First Aid for the Boatman," CG-525, U.S. Department of Transportation.

chock talk

...incidents and incidentals with a maintenance slant.

System Short Circuit

While cruising along, halfway through their flight, the F-4 crew noticed an unsafe nose gear indication. They slowed down and lowered all three gear. They all indicated safe, but the nose gear steering circuit breaker was popped. The circuit breaker reset, but the aircrew decided not to rely on having nose gear steering. Sure enough, when they landed, the nose gear steering didn't work. After shutdown, they found out why: the whole nose gear steering control box was missing.

Before this flight the nose gear steering box had been removed and used to trouble shoot another aircraft's nose gear steering problem. The personnel who did this did not notify their supervisors. They also made no entry in the aircraft forms. Then, when the box was reinstalled, it was reattached to the cannon plugs, but not fastened to the aircraft. Since no supervisors were notified and no entry was made in the forms, no one checked the installation of the control box.

The fact that it was unattached was not obvious enough to draw the attention of the pilot on his walkaround. The nose gear steering worked, and the aircrew took off. During their flight, they flew a practice approach with the gear down and the steering box flailing in the airstream. It damaged several hydraulic lines and a wire bundle before it came loose from the cannon plugs and fell off. The damage probably caused the unsafe gear indication which later alerted the aircrew. Fortunately, the damage did not prevent the nose gear from coming down normally.

The whole reason for having a system requiring entries in the forms and supervisory checks is to prevent this kind of error from getting airborne. Let's not short circuit the system.

A Day Late

Another F-4 had nose gear steering problems, but this ride was more exciting. On landing roll at about 90 knots, the pilot engaged nose gear steering, hoping it would help him stay aligned with the runway. No such luck. Even though the rudder pedals were neutral, the nose gear went right. The pilot cycled the steering off and on. The nose gear remained cocked right, and the aircraft drifted right despite full left rudder and left braking. The aircraft ran off the runway and stopped in the mud to the side. Both engines were damaged by ingesting mud, but no one was injured.

Investigation showed that this aircraft had been written up eight times in the month and a half prior for nose gear steering problems. The first three times it was written up, they replaced the cannon plug for the follow-up potentiometer. The next two writeups resulted in repair of the follow-up potentiometer itself for a short. Then a shimmying problem occasioned the replacement of the servo valve cannon plug. After that, the command potentiometer was adjusted when the nose gear began pulling right.

Following this incident, they found an internal problem in the command potentiometer: too much electrical resistance in the wiper area. The result was an unpredictable directional input to the nose gear steering when the pilot activated the system. The command potentiometer was replaced, and the airplane has flown okay since then.

So, we finally solved the problem. It's just too bad we couldn't have done it one sortie sooner.

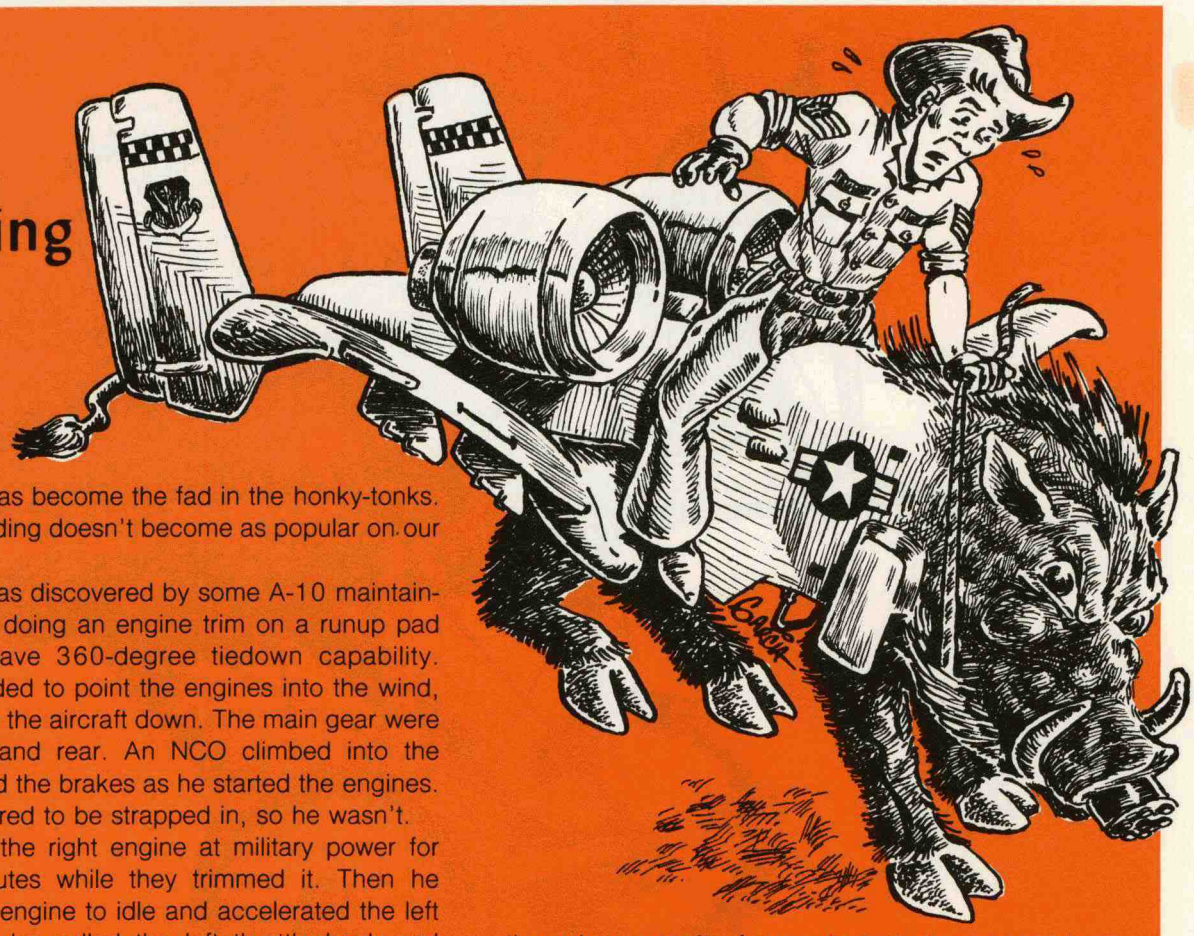
A Crimp In Its Style

It was the RF-4's first flight since phase inspection. Shortly after takeoff, at 300 knots and 500 feet above the ground, the airspeed suddenly showed a 50 knot decrease and the altimeter dropped to 500 feet below the zero mark. The pilot joined up with his wingman and flew a wing approach to a successful landing. During the approach, the indicated airspeed decreased to less than 100 knots, the altimeter fluctuated 200 feet either side of zero, and the true airspeed showed 136 knots.

After flight, investigators found a crimped pitot-static line in the radome. The line was replaced during phase inspection, but the replacement line was too long and was not properly mounted. After the line was installed, the radome was raised to change a nut plate and then lowered and secured. Even though they were careful to make sure that the line was clear when the radome was lowered, the line was still crimped by the movement because it was too long.

That shows us why we all have to be precise in our work. Our aircraft won't tolerate a that's-about-right fit.

Hog Riding



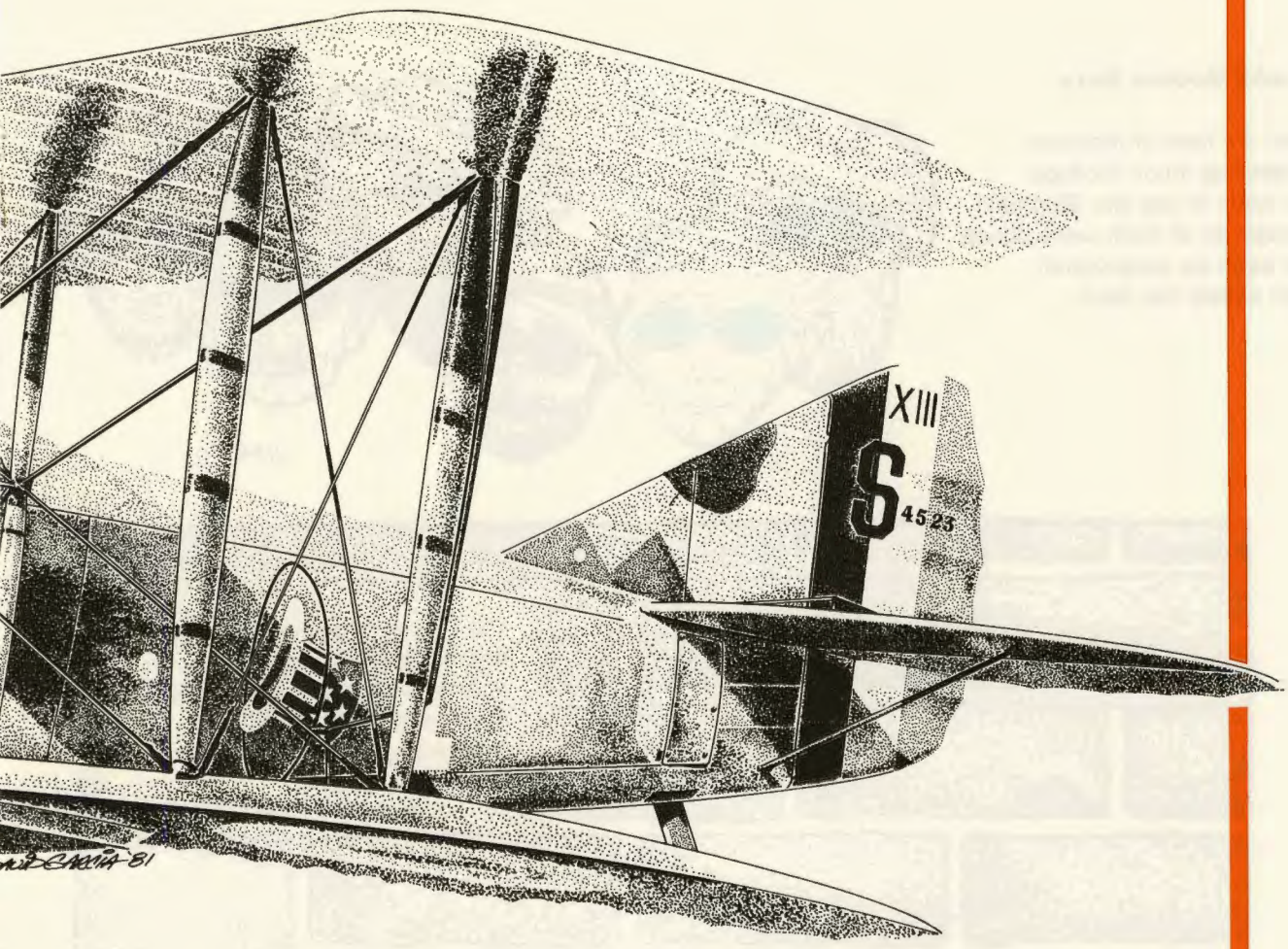
Bull riding has become the fad in the honky-tonks. We hope hog riding doesn't become as popular on our runup pads.

Hog riding was discovered by some A-10 maintainers. They were doing an engine trim on a runup pad which didn't have 360-degree tiedown capability. Since they needed to point the engines into the wind, they couldn't tie the aircraft down. The main gear were chocked front and rear. An NCO climbed into the cockpit and held the brakes as he started the engines. He wasn't required to be strapped in, so he wasn't.

First he ran the right engine at military power for about five minutes while they trimmed it. Then he pulled the right engine to idle and accelerated the left engine. Finally, he pulled the left throttle back and again pushed the right throttle up to military power. About a minute later, his ride began. The A-10 jumped the chocks. The bouncing threw the mechanic around in the cockpit: his hand came off the throttle and his feet slipped off the brakes. The aircraft bounded across the runup pad. As he regained some pressure on the brakes, the A-10 skidded off the pad into a slippery grass area. There it accelerated and crashed through a security fence. At last, the mechanic regained his position in the cockpit enough to pull back the throttle. The airplane came to a stop on an adjacent closed runway.

We can't recommend hog riding as a replacement for bull riding, but strapping into the cockpit might be a good idea, just in case the hog decides to start bucking.

SPAD XIII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THE PARABLE OF THE BLIND MEN AND THE ELEPHANT

By John Godfrey Saxe

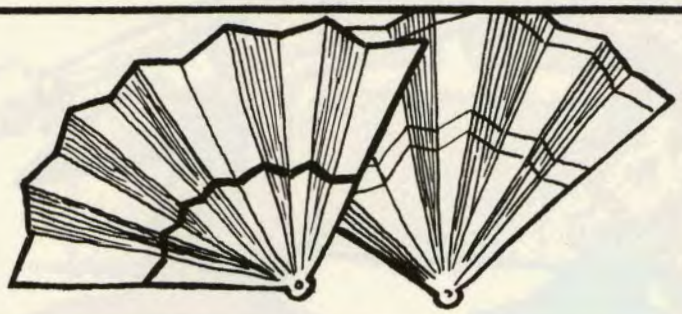
It was six men of Indostan
To learning much inclined,
Who went to see the Elephant
(Though all of them were blind),
That each by observation
Might satisfy his mind.

The First approached the Elephant,
And happening to fall
Against his broad and sturdy side,
At once began to bawl:
God bless me! but the Elephant
Is very like a wall!

The Second, feeling of the tusk
Cried, "Ho! What have we here
So very round and smooth and sharp?
To me 'tis very clear
This wonder of an Elephant
Is very like a spear!"

The Third approached the animal
And, happening to take
The squirming trunk within his hands,
Thus boldly up he spake:
"I see," quoth he, "the Elephant
Is very like a snake!"

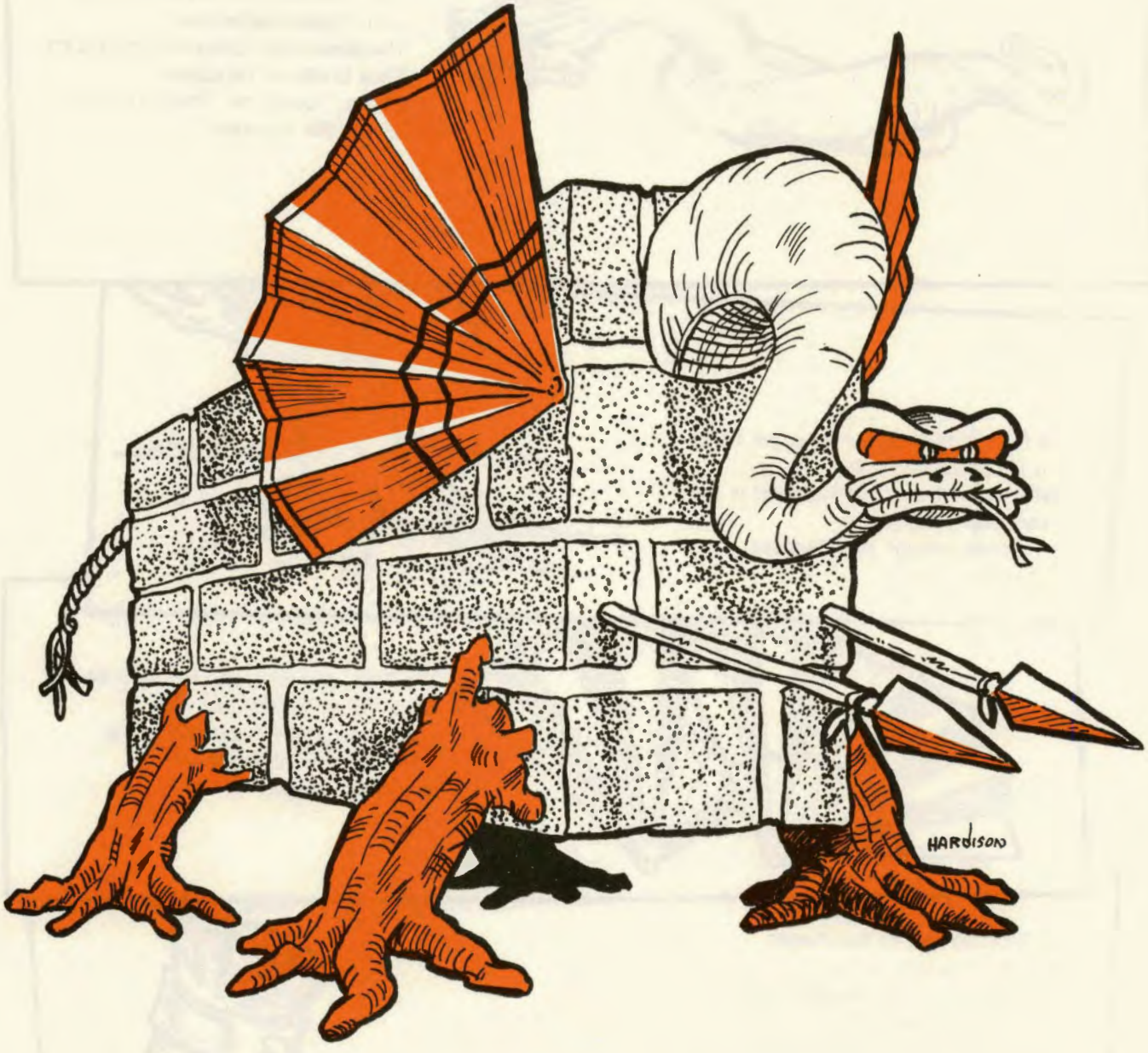
The Fourth reached out an eager hand,
And felt about the knee.
"What most this wondrous beast is like
Is very plain," quoth he,
" 'Tis clear enough the Elephant
Is very like a tree!"



The Fifth, who chanced to touch the ear
Said: "E'en the blindest man
Can tell what this resembles most;
This marvel of an Elephant
Is very like a fan!"

The Sixth no sooner had begun
About the beast to grope
Than, seizing on the swinging tail
That fell within his scope,
"I see," quoth he, "the Elephant
Is very like a rope!"

And so these men of Indostan disputed loud and long,
Each of his own opinion exceeding stiff and strong.
Though each was partly in the right, they all were in the wrong!



THE BIG PICTURE

Crew Chief Safety Award

SrA Adolph J. Cieplenski III is this month's winner of the Tactical Air Command Crew Chief Safety Award. Airman Cieplenski is an aggressor crew chief with the 57th Fighter Weapons Wing, Nellis Air Force Base, Nevada. He was chosen for his superior daily performance. His attention to detail when preparing his aircraft for flight has led several times to the discovery of problems on other aircraft besides his own.

One time recently, when working on a stabilator problem on his own aircraft, Airman Cieplenski realized the problem could be widespread, so he asked for an inspection of the same area on other F-5s. That inspection turned up several rigging problems which were then corrected. Another time, during a thru-flight check, he discovered that the skin on the right aileron was beginning to peel apart. By alerting his supervisors, Airman Cieplenski brought about the detection and correction of the same dangerous problem in other aircraft.

Airman Cieplenski has shown true professionalism by his skill in maintaining his aircraft and by his concern for others in letting his supervisors know about problems. He has earned the TAC Crew Chief Safety Award.

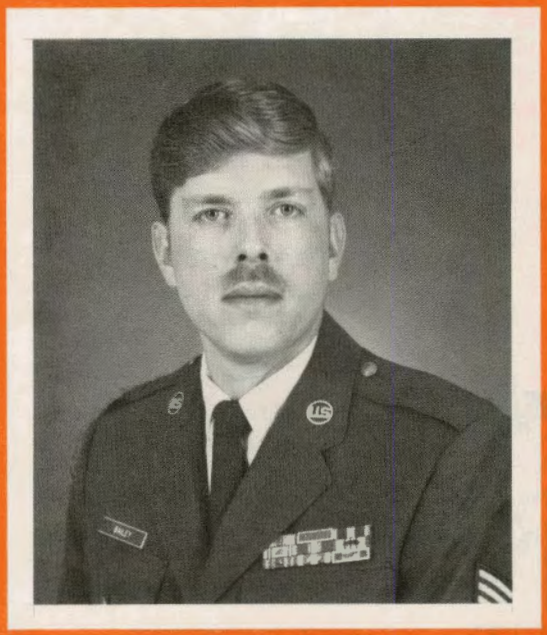
SrA Adolph J. Cieplenski III

Individual Safety Award

SSgt Jon M. Bailey is this month's winner of the Tactical Air Command Individual Safety Award. Sergeant Bailey is the NCOIC of the Dart and Tire Section, 405th Equipment Maintenance Squadron, 405th Tactical Training Wing, Luke Air Force Base, Arizona. He is responsible for the tearing down and building up of some 5,000 wheel and tire assemblies each year for all the aircraft assigned to Luke AFB. His shop also provides the maintenance support for over 300 tow-target missions each year.

During his 3 years in charge of the shop, Sergeant Bailey has received excellent or outstanding ratings for safety, foreign object damage (FOD) prevention, and housekeeping every time his section has been inspected. He has received the 405th TTW FOD Prevention Award, and he was commended by 12th Air Force for his section's support of the FOD prevention program.

Sergeant Bailey designed a vertical storage system for towed target darts which conserves space and reduces hazards. He has submitted hazard reports suggesting safer use and transportation of solvents, paint removers, and nitrogen gas. Sergeant Bailey has also submitted several ideas through the Air Force suggestion program. He is a dedicated professional and fully deserves the TAC Individual Safety Award.



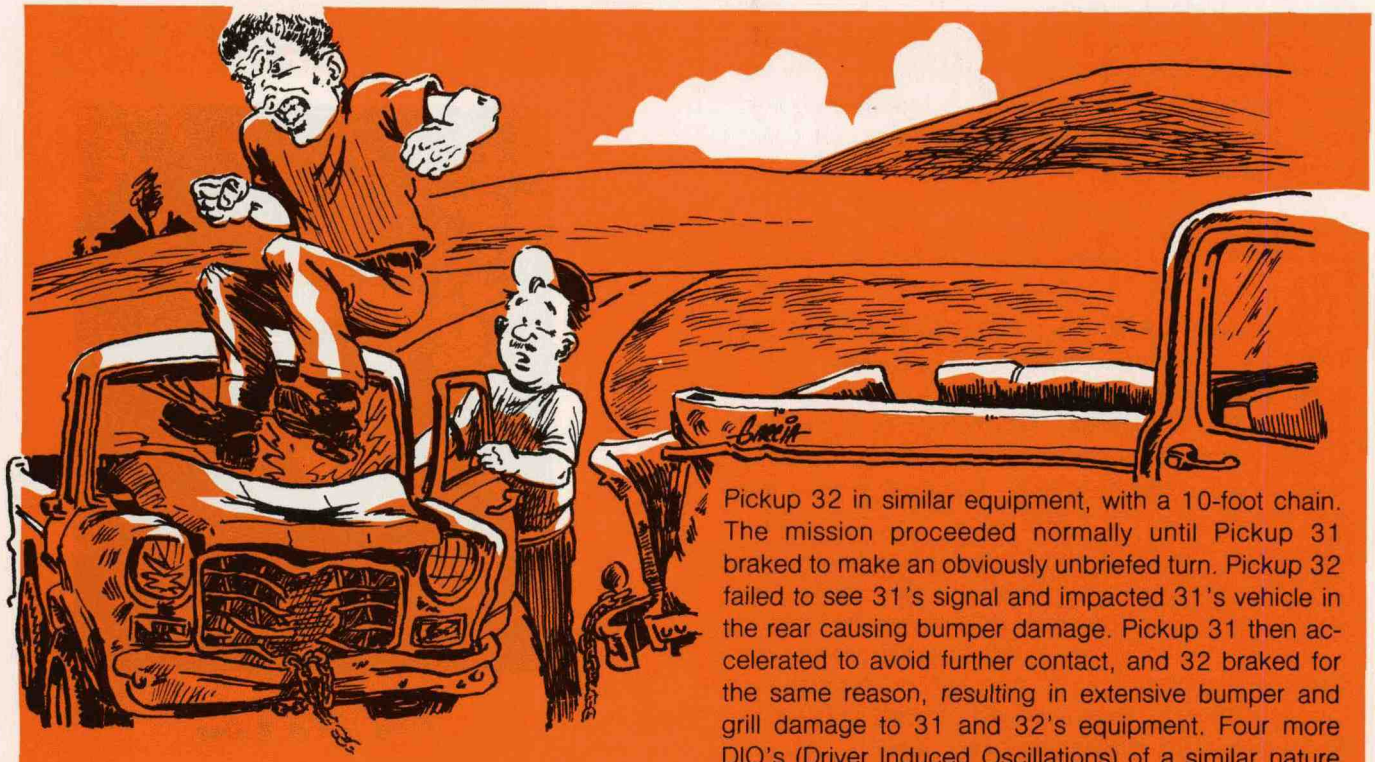
SSgt Jon M. Bailey

Neighborhood MISHAP REPORTS

By Major Charles H. Vaughn
24 COMPW, ANG A-7D Liaison

Fellow birdmen, we are not the only ones stepping on our neckties. You don't have to wait until after dark to sneak in the back door of your house or tell the neighbors that your goatskin is a boy scout leader's uniform in order to avoid embarrassment. Old Fred next door makes a lot of boo-boos too, only he doesn't send a teletype message to the whole darn neighborhood.

I've been watching and taking copious notes for the last few years, and here are three examples of how recognizable Air Force phrases used in mishap reporting could be used to describe similar incidents and accidents from our counterparts on the other side of the fence:



". . . The Flight leader, Pickup 31, failed to brief all aspects of the mission which resulted in confusion on the part of the wingman as to the sequence of events just prior to the mid-air collision."

Pickup 31 was driving a late model pickup, towing Pickup 32 in similar equipment, with a 10-foot chain. The mission proceeded normally until Pickup 31 braked to make an obviously unbriefed turn. Pickup 32 failed to see 31's signal and impacted 31's vehicle in the rear causing bumper damage. Pickup 31 then accelerated to avoid further contact, and 32 braked for the same reason, resulting in extensive bumper and grill damage to 31 and 32's equipment. Four more DIO's (Driver Induced Oscillations) of a similar nature occurred causing catastrophic fender failure, broken glass, and a punctured radiator. After the vehicles came to a stop, Pickup 31 debriefed 32 by jumping up and down on Pickup 32's hood, inflicting additional damage that looked like a 400-pound hail stone depression.

". . . A query from tower broke Auto 71's habit pattern on downwind and he failed to ensure his gear was lowered prior to landing."

Auto 71 and his wife Auto 72 both worked: she on the night shift, he on days. Auto 72 would come home at 0700 and put her car in her side of the two-car double-door garage, leaving her door open. Auto 71 left for work at 0800 and would dutifully close Auto 72's garage door, open his own, and depart for work. This routine had gone on for years when one day Auto 72 came home from work at her usual time and, feeling patronizing (as wives do at times), decided to close her door and open Auto 71's. An hour later, Auto 71 left the house and, as usual, raised the closed door and lowered the open door. He then jumped in his trusty steed and promptly backed through the closed door.

". . . The crew of Mower 71 exercised poor judgment in assuring the safe operation of their aircraft. . ."

Mower 71 and 72 were neighbors who shared a common hedge on their lot line. Innumerable hours were spent by 71 and 72 hand trimming their 150-foot-long hedge. Mower 71 and 72, in order to make more efficient use of their time, developed a new tactic: Why not use a 21-inch rotary lawn mower to trim the top of their 4-foot-high hedge? The adjustable cutting height of the lawn mower only allowed for a maximum cutting height of 2½ inches; that should have been the end of that idea. However, Mower 71 and 72, after careful briefing, decided that standing on opposite sides of the hedge, holding the running lawn mower by the wheels, and carrying it at a 4-foot height would get the job done. The horror story of the loss of nine fingers and one eye need not be told. It suffices to say the end did not justify the loss incurred during the means.

So there you have it. We aircrews do not have a corner on the mishap market. What we do have is the message traffic and crosstalk to help us avoid similar incidents and accidents in the future. "Bad press" can be a positive influence.

HERE COMES THE SUN

That tan we seek is only one of many effects of exposure to the sun. Other less desired effects include sunburn, skin wrinkling, warty growths, and skin cancer. Those aren't exactly the qualities that make us the envy of everyone else on the beach.

Our skin is designed to protect itself from the damaging ultraviolet rays of the sun. The design features, though, assume some common sense in avoiding excessive exposure. One design feature to protect the skin is the outer layer of the skin itself. That layer is made up of dead cells which absorb most of the ultraviolet light, protecting the living cells which are further down.

Another protective feature is melanin, which reflects ultraviolet light. It is formed by cells in the bottom layer of the skin. Ultraviolet light which gets past the outer layer of skin stimulates these cells to produce melanin. The melanin is injected into skin cells and forms a shield over the genetic material. This protective reaction of the skin is what gives us a tan. It is also what accounts for differences in skin color.

Don't rely on dark skin color or a tan to protect you completely, however. There is a limit to the exposure the skin can tolerate regardless of the amount of melanin present. That's why there are 300,000 cases of skin cancer reported each year in the United States. The cure rate for skin cancer is high when it's discovered early; still, 5,000 people die from it each year.

So, remember that other protective feature designed into us—common sense. Let's not overexpose ourselves to the sun's rays. And don't be fooled by a cloudy day: clouds are water vapor, and the ultraviolet rays can penetrate water. As a matter of fact, although dry clothing reflects most ultraviolet light, wet clothes will let half of the ultraviolet rays through to your skin.

Plan your outdoor activities to avoid extensive exposure to sunlight during the high risk period from 10 o'clock a.m. to 2 o'clock p.m. Use a sun screen or sun block lotion when you are going to be in the sun. And don't overdo a suntan. You're not going to improve your looks by turning into a lobster or a prune.

FIREWORKS

Despite their patriotic image, fireworks are a real hazard, especially for children. Burns, amputations, and blindings have resulted from 4th of July celebrations. In 1966, the federal government prohibited the general sale of the more dangerous types of fireworks; for example, cherry bombs, aerial bombs, M-80 salutes, and larger firecrackers containing more than two grains of powder.

The law hasn't eliminated all of the mishaps, however. The Consumer Product Safety Commission reports that last year many victims were treated in hospital emergency rooms for fireworks-related injuries; more than half the victims were under 15 years of age.

While some of the injuries were caused by banned fireworks that had been illegally sold, the majority were linked to legal fireworks.

To prevent injuries from fireworks, the Consumer Product Safety Commission gives the following suggestions:

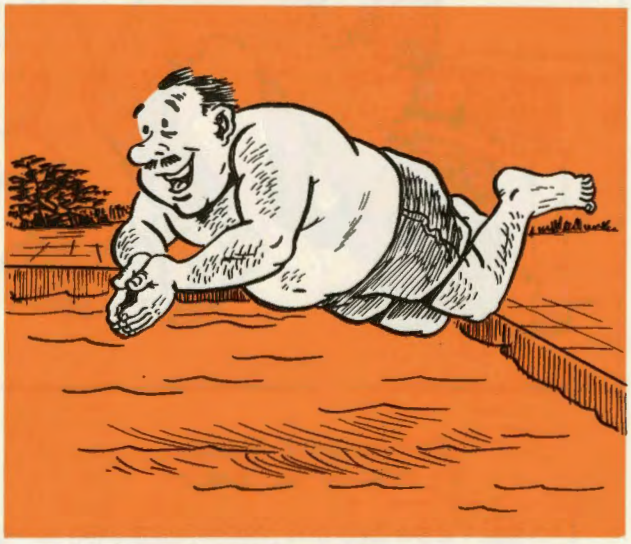
- Before using any firework, read and follow all warning instructions printed on the label.
- Remember that fireworks are not toys for children. The sparkler, often considered the ideal "safe" firework for the young, in fact burns at very high temperatures and can easily ignite clothing. Do not allow younger children to play with fireworks under any circumstances. They cannot appreciate the danger involved and cannot act correctly in case of an emergency.
- If you permit older children to use fireworks, be sure they are closely supervised by adults. Don't allow any running or horseplay while they are being used.

BELLY FLOPS ARE SAFER

The worse your dive looks, the safer it may be, at least as far as hitting the bottom is concerned. Dr. Albert Esch, medical director for the Consumer Product Safety Commission, says: "A perfect dive, like the Olympic divers do, is a risk for anyone except the professional. On the other hand, if arms are making a big splash and the legs are bent the wrong way, then the diver has lots of 'drag' slowing the descent under the water. In other words, the sloppier the dive, the safer the dive seems to be."

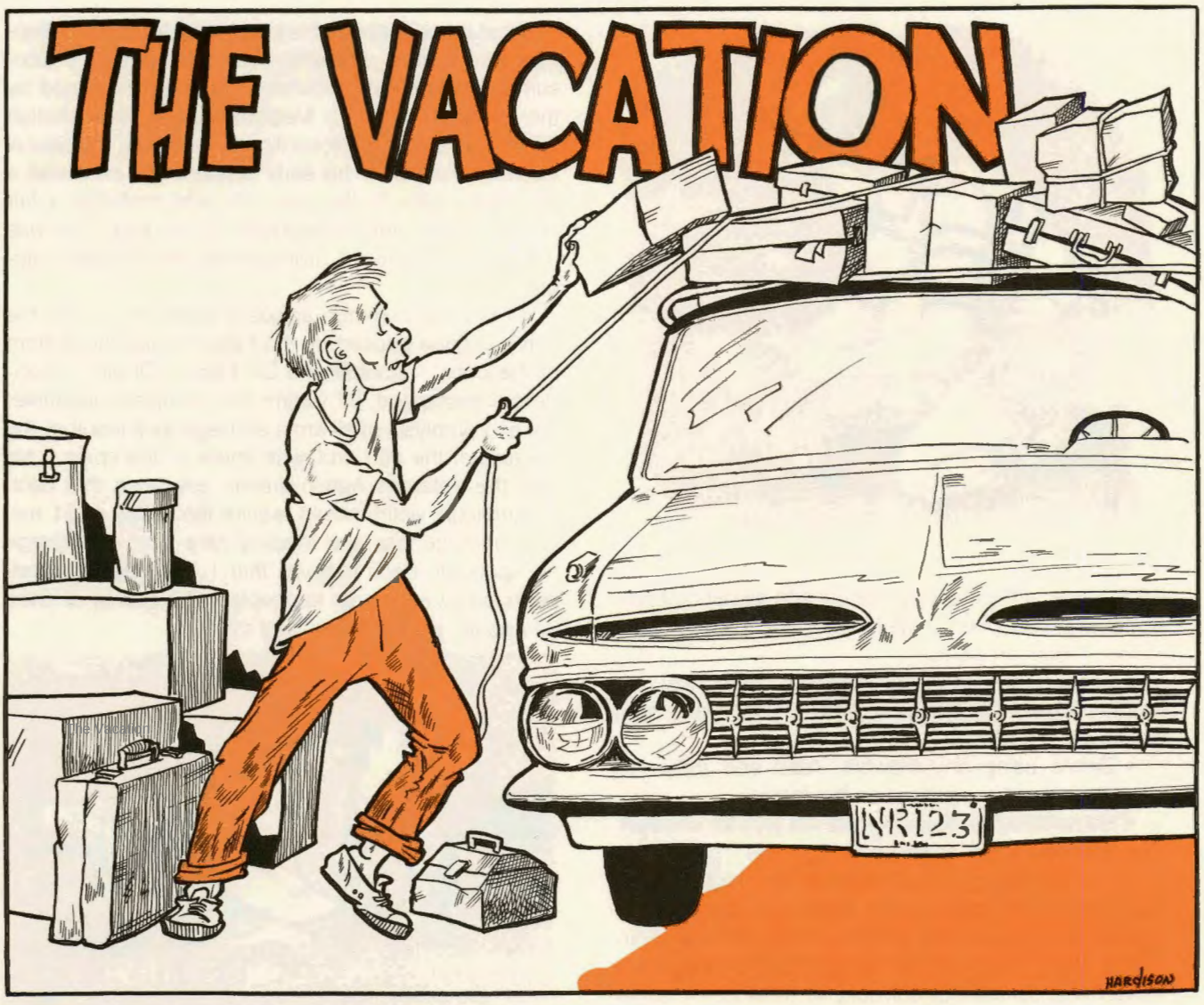
What brought about this good news for us belly-floppers was a study on diving safety funded by the Consumer Product Safety Commission and conducted by the University of Miami Medical School. They studied 72 diving accidents. According to the study, the typical victim was a male in his early twenties who often was a first time visitor to the pool. He was probably a fair swimmer, was not on alcohol or other drugs, but was doing some show-off diving when the accident happened.

"The most common accident involved injury to the cervical spine caused by the head striking the bottom of the pool," according to Dr. Esch. "Of all 72 accidents investigated, 57 victims had complete quadriplegia and paralysis of all arms and legs as a result of the fracture of the fifth and sixth levels of the spine." He said the Veterans Administration estimated that each quadriplegic victim would require the outlay of $1 million for wage loss and medical care over an average life span. Dr. Esch believes that 1,000 crippling accidents occur each year to people in the course of dives into pools, ponds, lakes, and rivers.



Asked if there were such a thing as a safe dive, Dr. Esch said a dive from the side of a below-ground pool was probably safe, provided the dive were made into at least 6 feet of water. If the dive were made from a 3-meter diving board, 8 to 10 feet of water would be necessary. Under no conditions should a dive be made into an above-ground pool, Dr. Esch cautioned.

"Many, many disabling injuries result from dives made in water less than four feet deep," he said. "At depths like this, it wouldn't matter whether the underwater surface were mud or concrete. Keep in mind that an average person is plunging into the water from a dive at the rate of four feet per second, and this is fracture speed."



By TSgt Dave Tresize
23 TFW Ground Safety

The first I knew Ben and Martha were even going on vacation was when I overheard Martha asking my wife to water her flowers for the next couple of weeks 'cause they'd be leaving in an hour or so or whenever Ben was finished packing the Chevy. I didn't have to look at my watch to know they were getting a late start. After all, me and Ben had worked in the garden the better part of the day, supper had been over for nearly an hour, and sunset was only moments away. I figured a little closer look-see was in order.

As I walked out of my house, I nearly had "the big one" as I saw all the stuff Ben was trying to put in and on that Chevy. Great day! You'd have thought he was moving out. As I drew nearer, I could tell by the muttering, the empty beer cans, and the far-away look in his eye that all this stuff was not his idea. Ben blew his cool about that time as Ben Junior and Marsha came out of the house with another armload. Ben leaned against the car as the kids went back into the house.

It was about this time that Ben spotted me and let me know in no uncertain terms that he'd already planned safety into this trip and didn't want a pep talk from me. I could tell he wasn't ready for a few of the finer points he might have missed; so I passed the chance, knowing I'd get another shot at him later. Ya just can't talk to a guy that's mad.

Ben already had the trunk of the car full and was busily heaping mounds of stuff on the roof. He finally had all on the roof that he'd dare put there and started lashing it down with a rope. He worked a weave pattern from front to back with the expertise only a GI could master. I was watching in amazement as Ben did something right for a change, but then the inevitable

Another saga of Ben and Martha

happened: Ben's talent for minor disasters came rushing out in the form of a broken rope. Doesn't sound like much on the surface, does it?

Ben was pulling the rope tight by putting one foot against the car's bumper to gain leverage. The rope broke with a quick snap, and Ben tumbled backwards into the wooden shelves that held all of Martha's flowers. Pots fell everywhere, shattering into a jillion pieces. One from the top shelf took off like a homesick pigeon and crashed through a plate glass picture window, spilling black dirt all over Martha's brand new peach-colored carpet. Martha's screams of rage completely drowned out my unrestrained giggles.

As all this was going on over on Ben's side of the car, all the stuff he'd stacked on the roof was falling in the only mud puddle within a radius of 6 miles. I made my move for a well timed safety briefing.

I slipped Ben off into a corner out of Martha's line of sight, opened a couple of cans of "Old Gutwrencher," and got him started talking.

It seems they were only going about 500 miles to "Fat Frank's Friendly Fish Camp and Spa." Fat Frank had promised to teach Ben and Ben Junior all about fishing while Martha and Marsha enjoyed the spa. Ten days of this for only $525.00 plus room and board.

I eased into my safety pitch. Ben had new tires, wipers, and brakes. In addition, all the other systems vital to safe operation of the car had been checked by a good mechanic and pronounced healthy. Ole Ben had gone to a lot of trouble to make sure that Chevy was right. I couldn't figure out why he'd do all that, then try to drive all night without any rest after drinking what had to be a six pack of beer.

I told Ben this looked to me like he was stacking the deck against himself, and I'll be a son-of-a-gun if he didn't agree. He was just trying to get the most out of every day of his leave. It seemed as though peace and serenity were to once again rule supreme on Harmony Lane. We'd forgotten about Martha and her flowers, carpet, etc.

I slipped out the gate and started to pick the stuff up from the mud puddle as Martha hit Ben with the opening salvo of what was destined to be a truly classical battle.

Thirty minutes later Ben reappeared with a sheepish grin on his face and said he'd convinced Martha of the wisdom of pulling out first thing in the morning instead of tonight if I'd help pack the car and if my wife would help clean up the stuff in the mud puddle. It seemed like a cheap price to pay to get ole Ben started on vacation the right way.

Next morning as I was leaving for work, Ben and Martha were just pulling out. Everyone was smiling and happy. It appeared as though Ben's run of hard luck was broken. Just as I was pulling out of the driveway I heard a loud bang. About a half block from the house, Ben ran over a bottle and had a blowout on the right rear. I took the scenic route to work. No sense in causing a traffic jam.

WEAPONS WORDS

HELPFULNESS OVERDONE

Overseas, a missile maintenance crew chief was left in the shop while everyone else was at lunch. A factory technical representative came by and asked the crew chief to check out an AIM-7F missile that was in ready storage. Anxious to please, the crew chief looked around for some help. He found a munitions storage crewmember, who was there to pick up empty containers and take them back to storage. The crew chief asked him to help and he agreed. Together they went to the storage rack, where the crew chief picked up the front end of the missile and his helper picked up the back end. The helper lost his balance, tripped, and dropped his end of the missile.

In his effort to go out of his way to help the tech rep, the crew chief disregarded the tech data and local procedures. He used an uncertified helper. He did not have the required three people to move the missile. And he did not use the proper handling equipment, a hoisting sling assembly.

We really appreciate his desire to be helpful. After all, we've spent too much time in shops where you can't get what you need because the only person authorized to help you is never around. But in this case, the crew chief offered more than he could rightfully deliver. He was right in being courteous; but he should have said, No, I'm sorry, you'll have to come back later. His can-do attitude would have been better if it were a can-do-correctly attitude.

WRECKED ROCKETS

A weapons crew overseas was unloading rocket motors for inspection. They were using a forklift to lift the motors off of a trailer. The motors were in bunches of eight tied together by two tiedown straps. The tech order, by the way, specifies that rocket motors must be palletized prior to movement. The crew didn't palletize the motors. They simply slid the fork under the rocket motor boxes. At the time, they were using a local checklist, one step of which states, "Secure load."

The stacks of rocket motors were not secured to the fork lift by any means. Mostly by chance, the first two loads of motors were successfully transferred to the dock.

As the fork lift backed away from the trailer with its third load, it was forced to cross some uneven pavement. As the wheels crossed the 1½-inch drop, the fork tines tilted, the load shifted, and the rocket motors fell off.

These types of incidents always seem to be caused by a violation of the tech data or by a violation of common sense or, as in this case, by a violation of both.

VARIATION ON THE THEME

This is going to sound familiar. During a night refueling mission the F-4 pilot decided to dump some fuel. The second part of his mission had been scrubbed due to bad weather. He was going to get rid of some fuel before landing on a wet runway. He did. When he moved the switch, he felt a thump: both wing tanks had jettisoned. He had the wrong switch.

In this case, the pilot had actually looked at the right switch and put his hand on it. Then he was distracted momentarily by a radio call, and he flipped the wrong switch as he moved his hand to answer the radio.

Again, the pilot messed with a guarded switch when he shouldn't have. But, again, he had some help. The fuel dump switch in this airplane was shaped like the jettison switch; it's supposed to have a distinctive hexagon shape to make it feel different. That may have contributed. Still, the real problem seems to be that his mind lost track of what his hands were doing.

BUMP IN THE NIGHT

During a night refueling mission, the F-4 pilot decided to select "internal only" on the refuel selection switch. Since it was night, he located the switch by feel. When he flipped it, the wing fuel tanks jettisoned. The switch he got was the wing station switch; he had moved it to "jettison." The switch he moved had a safety guard on it, but the one he was looking for didn't. The guard should have been safety wired, but it wasn't.

As pilots, we should be more hesitant to mess with guarded switches. As maintainers, we can help the pilots be more cautious by putting safety wire on the guards.

THE GUILLOTINE

This guillotine isn't as deadly as Robespierre's, but it can be dangerous. It's an explosive cartridge in the F-4 ejection seat. Like all explosives, it commands respect.

A crew chief was removing the ejection seat safety pins during preflight when he found one that was stuck. The guillotine pin streamer was tangled in the oxygen hose which was pinned between the seat and the right console with the seat full down. Instead of taking the time to apply power to the airplane and raise the seat, he removed the guillotine safety pin and pulled up on the oxygen hose and streamer. They suddenly came free and caught the guillotine handle. That, in turn, fired the guillotine cartridge. Fortunately, no other damage was done. But we reckon he'll hesitate before he uses brute force around an ejection seat next time.

HYDROPLANING

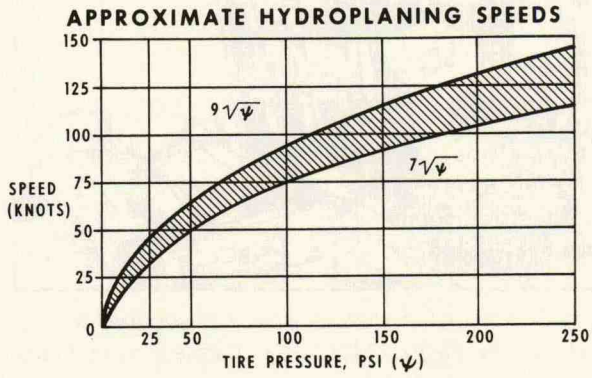
By Lt Col Bruce M. Mosier
174 TFS, Iowa Air National Guard

NASA has been studying the phenomenon of hydroplaning for approximately 20 years. Studies of fluid mechanics and wave action in maritime applications were applied to the atmosphere as a fluid and, in particular, its interface with water on the surface. There is no question that hydroplaning exists, and that it can present substantial problems for an aircraft on a runway. There are differences of opinion as to the required speed for the onset of hydroplaning, but the effects after onset are readily predictable.

Partial hydroplaning occurs as speed builds; but as long as some of the tire is in contact with the surface, control will remain and some ability to brake is available. The amount of braking will vary considerably.

When full dynamic hydroplaning occurs, the tire is not in contact with anything but the water, much as a water skier is lifted to the surface. Rotation of the tire can slow or stop during this dynamic hydroplaning, and this can cause problems when contact with the surface is reestablished. In an automobile, for instance, the car's thrust vector is now unchangeable until contact is again made after momentum is slowed. This is true because thrust from tire traction is not available nor is braking effective when the tires are hydroplaning.

In an aircraft, thrust would be available from the engine, since it is not dependent on tire traction, but braking would be nonexistent. Therefore, if an aircraft began hydroplaning and was still moving at a speed near the dynamic hydroplaning region, definite consideration should be given to a go-around and landing again to avoid the hydroplaning speed regime. [Editor's Note: The go-around will only help if you landed fast the first time. If your landing speed is lower than your dynamic hydroplaning speed, you can avoid the hydroplaning speed regime by being on speed. But many of us have no choice: our landing speed is above the speed for dynamic hydroplaning. Still, being fast will keep you in the hydroplaning regime longer, so it always pays to be on speed.] A touchdown in a firmer manner may break the surface tension of any surface water and allow tire contact to begin braking.



The chart above shows the region of dynamic hydroplaning as a function of tire pressure. Various opinions place the onset of dynamic hydroplaning at approximately seven to nine times the square root of the tire pressure in pounds per square inch (ψ). The shaded area of the chart represents the region of 7 to 9 times tire pressure in *psi*, and can be entered with the applicable tire pressure to give a most likely speed range for the onset of dynamic hydroplaning. The conditions of the tire tread and the runway surface will also affect the onset of hydroplaning.

In the A-7D aircraft, the normal tire pressures are 250 psi for the main gear and 100 psi for the nose gear. Thus, the most likely speed range for dynamic hydroplaning would be from approximately 110 to 140 knots with the main gear, which is the range of normal touchdown speeds. A smooth, greased-on landing would therefore be very inappropriate on a runway that was wet. For the nose gear, hydroplaning could occur in the range of 75 to 90 knots, and nose wheel steering would not be effective when this occurs.

The graph has been extended back down to zero to give an indication of the approximate onset of hydroplaning in an automobile. At the speeds involved with cars, the difference in speed between knots and miles per hour is negligible. For a car with tires inflated to 28 psi, the likely onset of hydroplaning is about 40 MPH. If you have ever noticed a poor response in your car while driving in rain or snow near this speed, you most likely had an insidious indication of hydroplaning starting to occur. Caution on wet surfaces is always advisable, not only with aircraft.

TAC TALLY

	TAC		ANG		AFR	
	MAY	THRU MAY	MAY	THRU MAY	MAY	THRU MAY
		1981 / 1980		1981 / 1980		1981 / 1980
CLASS A MISHAPS	4	16 / 12	0	3 / 7	0	0 / 0
AIRCREW FATALITIES	1	9 / 8	0	2 / 6	0	0 / 0
TOTAL EJECTIONS	4	14 / 11	0	0 / 7	0	0 / 0
SUCCESSFUL EJECTIONS	4	13 / 9	0	0 / 4	0	0 / 0

TAC'S TOP 5 thru MAY '81

TAC FTR/RECCE	
class A mishap free months	
39	33 TFW
32	1 TFW
31	31 TTW
22	58 TTW
19	49 TFW

TAC AIR DEFENSE	
class A mishap free months	
114	84 FITS
100	57 FIS
53	5 FIS
50	48 FIS
31	49 FIS

TAC GAINED FTR/RECCE		
class A mishap free months		
109	188 TFG	(ANG)
101	138 TFG	(ANG)
100	917 TFG	(AFR)
97	116 TFW	(ANG)
87	434 TFW	(AFR)

TAC GAINED AIR DEFENSE		
class A mishap free months		
106	191 FIG	(ANG)
87	102 FIW	(ANG)
83	177 FIG	(ANG)
49	125 FIG	(ANG)
32	119 FIG & 142 FIG	(ANG)

TAC/GAINED Other Units		
class A mishap free months		
142	182 TASG	(ANG)
135	193 TEWG	(ANG)
130	26 ADS & 4787 ABGp	
126	110 TASG	(ANG)
122	USAFTAWC	

CLASS A MISHAP COMPARISON RATE 81/80

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

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	1981	4.0	3.0	3.2	5.6	5.9							
	1980	2.0	4.0	5.2	4.4	4.7							
ANG	1981	9.3	4.8	4.6	3.3	2.6							
	1980	5.0	7.6	6.6	7.1	6.5							
AFR	1981	0.0	0.0	0.0	0.0	0.0							
	1980	0.0	0.0	0.0	0.0	0.0							

☆U.S. GOVERNMENT PRINTING OFFICE: 1981—735-019/2


FLEAGLE
IT IS BELIEVED THAT AN INVESTIGATION OF CERTAIN AVAILABLE AN' POTENTIALLY APPROPRIATE...
INFORMATIONAL SOURCES WILL PRODUCE THE DATA WHICH IS REQUESTED IN YOUR RECENT ORAL COMMUNICATION. CONTRARIWISE, PROMULGATION...
OF CONTEMPORARY STRAWMAN CONCEPTUAL PREMISES HAS CONTRAINDICATIONS NOT UNIMPORTANT TO THE QUESTION. TERTIARILY, MISHAP...
PREVENTION IS AT TIMES PRECIPITOUS IN INITIATION AND EXECUTION. THE BIG PICTURE GIVES CREDENCE TO THE NECESSITY OF GENERATION OF INHIBITORY ACTIONS BY MULTIFARIOUS AIRCREW PERSONNEL AS A BOTTOM LINE.
HEY, WHAT DID HE SAY?
I THINK HE SAID, IF'N THEY EVER FIND OUT TH' ANSWER, ALL PILOTS IS GONNA BE BRIEFED.
HARRISON
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