TAC ATTACK

SEPTEMBER 1985

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ANGLE OF ATTACK

How long since your last mishap?

There are a lot of stories that fill the folklore of aviation—things happen in threes, it's bad luck to talk about safety, it's been _____ (you fill in the blank) since our last crash so we must be due, or it's been _____ since our last crash so we must have it made.

Perhaps there is some basis in fact for each of these old tales, but most of them won't hold up to the scientific evidence. Today the TAC Class A mishap rate is the lowest in TAC's history and most of our units are doing great. However, there is one statistical fact that continues to cause concern—there is a relationship between time since the last mishap and time until the next one.

I doubt that the relationship has anything to do with time. Rather, it is more a reflection of the attention that we tend to pay to mishap prevention. Perhaps the reason that we sometimes see things happen in threes is that it takes the second occurrence to get our attention and the third event occurs before we make the fix.

All of us have made great strides in keeping attention focused where it needs to be—at the pointy end of TAC's sword. We have used everything from CONSTANT ATTENTION, safety and spread-the-word messages to personal visits to squadrons and workcenters. These are all great ideas, they are obviously working and we need to vigorously continue all of them.

READINESS IS OUR PROFESSION is more than TAC's slogan, it is our way of life. It is a tough creed to live up to day after day: to be ready, operating at peak, all of the time. Sometimes it is seductive to think, *I know this job so well that I can do it from memory in my sleep; I'll just kick back a bit and be done in a heartbeat.*

We need to also use a microscope to look at how we are doing our jobs: have we become complacent, has familiarity bred contempt, are we too comfortable, are we resting on our laurels? We need to have a critical spirit when it comes to evaluating personal and unit performance.

But, a critical spirit is beneficial only if another action step is taken. We must be innovative in fixing that which needs fixing and accentuating that which is working.

Now is the time for each of us to thoughtfully look at our jobs and our units, what is our attitude, what is the attitude of our squadron and fellow workers, what needs fixing, what are we doing right that we can export to others?

The time for "soul searching" is before the accident!

Harold E. Watson

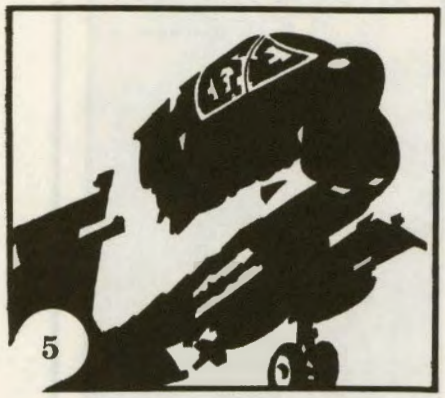
HAROLD E. WATSON, Colonel, USAF
Chief of Safety

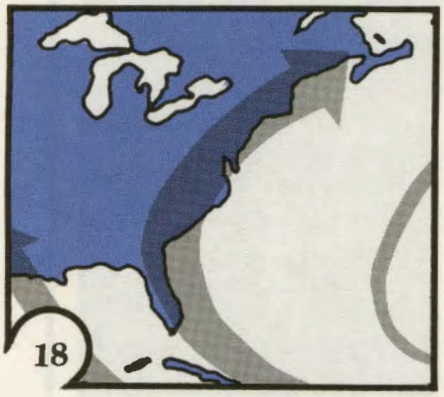
TAC ATTACK

SEPTEMBER 1985

DEPARTMENT OF THE AIR FORCE

FEATURES





DEPARTMENTS

TACRP 127-1

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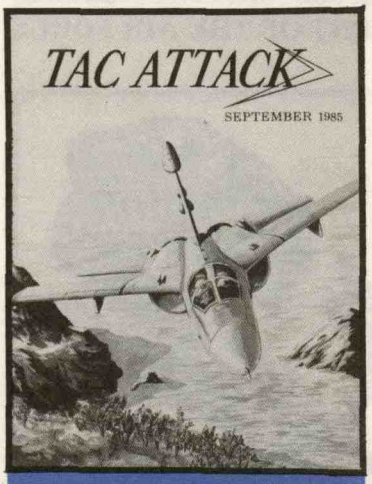

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LETTERS

Dear Editor

TAC Attack is the best written and most practical and informative Air Force magazine I've yet read. Keep up the good work.

I have some questions pertaining to the article titled "F-111 Stall Inhibitor System" by Major Jon Jordan. I have a 1975-vintage F-111 flight manual which doesn't mention the SIS computer at all. Could you please explain what the letters SIS stand for and what it does. Also, what does the term "Alpha Limiting" mean and where are the alpha and beta probes located on the aircraft? Thank you.

Yours Truly

Mr. G. Hawkins
Antes Fort
Pennsylvania

Dear Mr. Hawkins

The Stall Inhibitor System (SIS) was a late 1970s modification to the F-111 flight control system, installed to help the pilot control angle of attack (AOA, also known as "alpha") and sideslip ("beta"). The SIS computer limits AOA ("alpha limiting") to a value below the aircraft's predicted stall angle of attack. It also incorporates a "beta reducer" to help control sideslip (yaw) during maneuvering flight. It uses as inputs the signal from the existing left AOA, or "alpha" probe (located on the side of the aircraft below the forward left corner of the windscreen) and the signal from the existing yaw, or "beta" probe (located on the belly, just aft of the nose radome). The SIS mod added a right AOA probe (symmetrically located on the right side of the aircraft). When yaw is at a low value (coordinated flight), the SIS uses the lower AOA value from the two alpha probes in its alpha limiting computation. When yaw (beta) is high (above 7 degrees), it takes a conservative approach and assumes the aircraft is at a higher indicated AOA.

JON JORDAN, Major, USAF
F-111 System Project Officer
TAC Flight Safety

Dear Editor

I believe I have located the source of Fleagle's problem in the April 1985 issue of *Tac Attack:* the last caption should have read, "With the help of paint, rubber *and* droppings near th' end of th' runway."

Any engineer will tell you that the coefficient of friction of bird droppings is very low. When these are combined with a lubricant, say grease per MIL-G-3595, the coefficient of friction is zero. Hence the expression, *slicker than greased owl xxxx.*

Yours for science and flight safety

Mike Byers
Sales Engineer, Pacific Scientific
Warrenton, Virginia

LET'S TALK TURKEY

Lt Col Bill Powley
HQ PACAF/SEF
Hickam AFB, Hawaii

The aircraft flight mishap rates for the past two years show we are making some progress in reducing our self-inflicted losses. But while we haven't lost many fighters due to combat for ages, in peacetime we still manage to bury over a squadron of aircraft and some great aviators every year.

If you look at mishap reports every day, you have to feel a great sense of frustration over our losses due to spatial disorientation and misorientation in general. The Air Force is attempting to train us with vision-restricting devices, simulators, etc., to better cope with recovering from unusual attitudes. Let's get a grip. The real problem here is exposure to instrument flying.

AFM 51–37 states that when spatial disorientation proceeds to a point where the pilot is unable to either see, interpret or process information from the flight instruments, his only alternative is to admit that physiological limits have been exceeded and abandon the aircraft. There is no training that

LET'S TALK TURKEY

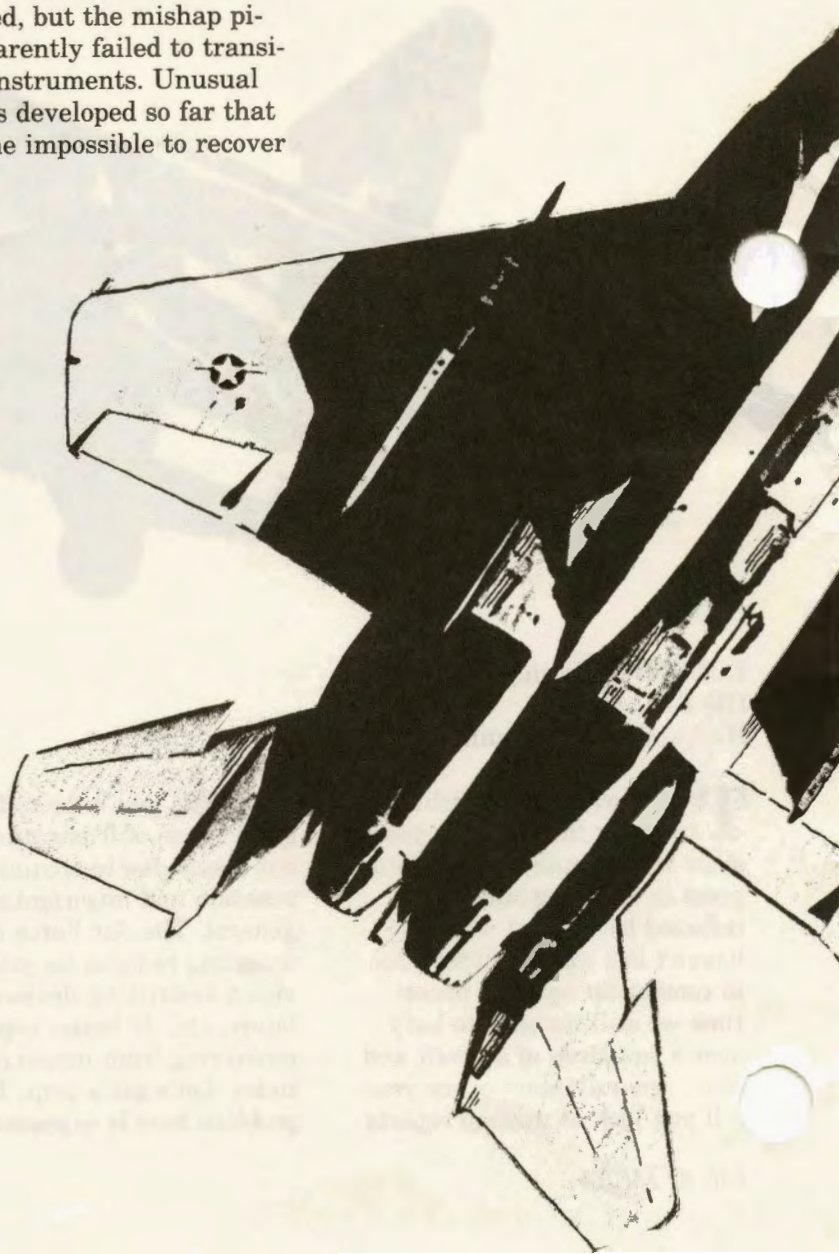
will overcome these physiological limits. When unusual attitude recoveries are given in training, the student knows he will find himself in an attitude from which he must recover to straight and level flight. So we never screw up *practice* recoveries.

The key is knowing when you need to make a *real* recovery. In a single-place aircraft, when situational awareness is lost, that fact is often not known until it is too late. The prioritization of tasks in instrument conditions must be basic instrument crosscheck first, or all else is lost.

Instruments are not fun. It's hard work to concentrate your attention on watching that the gauges don't move so you can maintain straight and level flight at a constant airspeed. We'd rather be in burner at 7-plus Gs ready to gun a bandit. However, several recent mishaps indicate that we don't have the savvy to cope with instrument conditions.

Our "instrument pilots" from the current school of aeronauts have a handicap, and that is about 50 hours less instrument time than the "old heads." Back when the UPT program was shortened, instruments took the big hit. What has happened is that our single-seat fighter force has not had the opportunity to make all the dumb mistakes the old heads did with someone in the aircraft to save their butts. You just can't beat experience for ironing out all the bugs and getting an opportunity to "see everything once."

We've had several fatalities lately just after takeoff where instrument conditions were encountered, but the mishap pilots apparently failed to transition to instruments. Unusual attitudes developed so far that it became impossible to recover before ground impact. In one case, the pilot was distracted by rapid transition to IMC, his IP going to lost wingman and the Master Caution and Oxygen Low caution lights illuminating. To be distracted in weather at



low altitude by such problems indicates a lack of situational awareness and subsequent incorrect prioritization of tasks—the first being to *maintain aircraft control.*

AFM 51–37 states: "Distraction, lack of situational awareness and spatial disorientation are not the same, but they are 'kissing cousins.' The root cause of each is related—failure to maintain an effective instrument crosscheck." The key to successful instrument flying, which should be the pilot's primary task in IMC, is an efficient instrument crosscheck. The best training to cope with spatial disorientation would seem to be instrument flying.

What's the solution? First, to solve the root cause, increase the amount of instrument training in UPT so that our fighter pilot graduates have a broader experience base to draw on early in their career. To take a historical perspective, the TAF HUD/Instrument Conference hosted by TAC in June 1983 documented the need to increase instrument training. This training has been implemented in several cases but still falls short of exposing our new pilots to the amount of actual instrument flying received previously by those students in the 240-hour UPT program. We should expedite the addition of instrument flight hours in the UPT program.

Second, and more "real time" oriented, our supervisors should realize the implications posed by the first solution—our young pilots need additional instrument training whenever they can get it. Bore yourself to tears and take a few instrument flights in the weather.

Third, and most important of all, each pilot should realize the chinks in the armor (limitations) of his instrument proficiency. Try crosschecking the gauges more frequently during VFR flights. See how close they read to what you "thought" they should be. It doesn't take long for channelized attention to turn your world "upside down." Decide that in instrument conditions, the first priority should be on the instrument crosscheck, even above wingman consideration, responding to radio calls and lights in the cockpit. 'Cause if you don't fly instruments in IMC, the others won't matter for long. Hopefully, most of us will have it together in a little bag, and we can do all of these things simultaneously. We then have good situational awareness—an accurate assessment of (1) what's happening in our aircraft; (2) what's going on around us; and (3) what our correct priorities are based on both of those.

It's not all that simple at times. Learn to be a survivor. And remember—be careful out there.

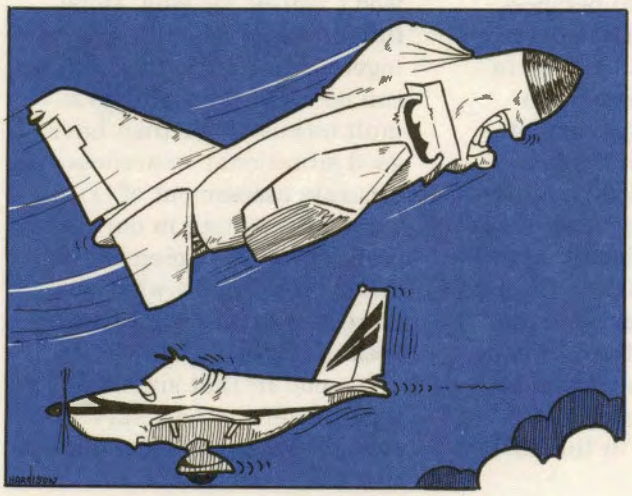
TAC tips

TAC tips INTEREST ITEMS,

Needle in a haystack

A beautiful VFR day. Visibility over 7 miles, good distinct horizon and the sky was cloudless. Why, it's clear and a million! A flight of F-4s tooled along at 4,100 feet MSL under radar control for a practice formation approach.

Approach Control gave a heads-up call, "Traffic, 12 o'clock, 3 miles, altitude readout 3,600." Shortly thereafter, as the flight members searched for the reported aircraft, Approach reported, "Clear of previously reported traffic." At the same instant, lead spotted a white, single-engine civilian aircraft at his 1230 on a collision course. With 150 knots of overtake, the F-4s took evasive action and subsequently missed the private plane by less than 100 feet. No evasive action was taken by the civilian pilot.



Where could all of this have been avoided? Were the aircrews lulled into a false sense of security because they were under IFR control and following radar vectors? AFR 60-16 reminds us that, during the IFR portion of a sortie, we are only separated from other IFR traffic which is operating within controlled airspace. "See and avoid" is *always* critical when weather conditions permit it.

The approach controller's information was misleading when he reported that the conflicting traffic was clear. Advisory calls are just that, advisory—intended to make us aware of potential conflict and help us to get our eyes on the bogie.

Where was the civilian aircraft in the F-4 crews' fields of view before it was reported? Should the aircrews have been able to see it first? Sometimes an aircraft's paint scheme, planform, relative position and heading will make it nearly impossible to see. Most times, however, adequate clearing and lookout will enable us to pick up traffic in sufficient time to avoid it without resorting to last-ditch maneuvers.

All of this is to remind us that see and avoid is essential from the minute we release brakes in the chocks until we shut down after landing. Keeping your head on a swivel is vital whether you're looking for the Hun in the sun, the other Falcon in the pattern or a Cessna on the airway.

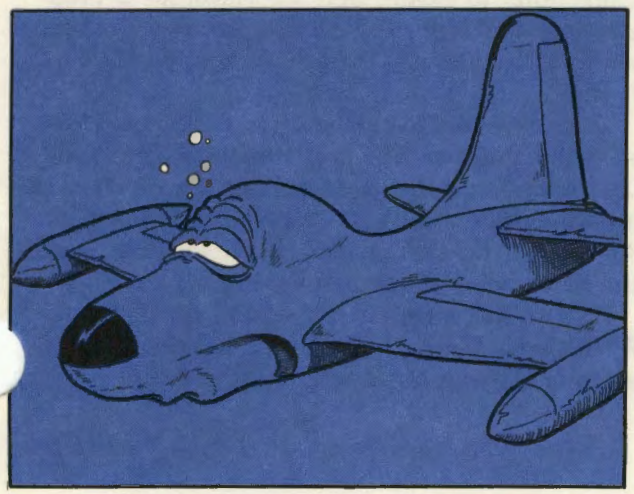
A healthy attitude of caution and skepticism, part of situational awareness, is always in order

to insure that someone else doesn't give you bad info that can lead you into a collision with the ground or someone else.

Something's not right here

What were *your* symptoms of hypoxia the last time you went through the altitude chamber? If it's been a couple of years ago since your last chamber ride, you may not remember.

A T-33 pilot noticed his personal hypoxia symptoms about 25 minutes after he leveled off at 31,000 feet. His oxygen mask fit was good, and all of his environmental equipment seemed in good working order; yet he noticed feelings of apathy and mental sluggishness. About 5 minutes after he went to 100-percent oxygen, the feelings went away. He descended below 10,000 feet and returned to base.



A check of the aircraft uncovered the fact that the pilot's oxygen regulator had failed internally. It took awhile at FL310, sucking less than optimum air, before the lack of sufficient oxygen began to produce the physical signs.

If you feel apathetic and mentally sluggish all the time, maybe you're not getting enough sleep or you just have a bad attitude. But keep an eye out for those feelings or other signs of hypoxia if they come on you suddenly. If you suspect hypoxia, get on 100-percent oxygen (gangloading the regulator will achieve that for you), descend as soon as practical to 10,000 feet or below and bring it on back home or to the nearest suitable airstrip as required.

The next time you submit your warm body to the folks at the altitude chamber, make a note of your personal hypoxic symptoms. They may come in handy during a future flight.

Watch the switches

Eagle drivers need to be particularly aware of their switch positions, especially the windshield anti-ice. That switch is supposed to be the lever locking variety that requires you to inten-

tionally move it in order to turn the anti-ice system on. The problem came when the F-15 depot approved a nonlever locking switch that can be used as a substitute. Now a pilot or crew chief can unintentionally move the anti-ice switch into the "on" position. There are no warning lights to tell you that the anti-ice is turned on, and the first indication you'll get is activation of the Windshield Hot light. By that time, it may be too late and the repair cost, as a result, is a new $25,000 windshield.

Actions are being taken to delete the unsatisfactory substitute. Meanwhile, those who fly in and work around the F-15 need to keep a watchful eye on that switch if their jet is equipped with the nonlocking lever. Let's not buy any windscreens that aren't necessary.

Ducks in turbulence

An 0-2 FAC was heading for the target IP when he was directed to a different orbit point because of bad weather in the primary target area. He was told to set up on the north side of an east-west ridge where he would wait for the first group of fighters to check in. Radio contact with the 0-2 was lost after that, and the aircraft wreckage was later found about 1,000 feet below the crest of the ridge. The plane hit the ground in a slight bank, 40 degrees nose low; but the velocity vector of the aircraft at impact was nearly perpendicular to the hillside.

Significant factors in the accident were turbulence and severe vertical gusts encountered by the pilot in the vicinity of the ridge. Turbulence not only makes aircraft control more difficult but it can also subject the pilot to severe downdrafts. Severe turbulence can produce downward vertical wind velocities from 2,100 to 3,000 feet per minute (FPM) and moderate ranges from 1,200 to 2,100 FPM.

How does this affect an 0-2? Performance tests show that the maximum (two-engine) rate of climb is about 1,180 FPM. Winds as low as 25 knots blowing straight across a ridgeline can cause moderate turbulence which can exceed the climb capability of the 0-2.

We all need to be aware that winds blowing across rugged hills or mountains will cause turbulence to increase as the windspeed increases. The most severe downdrafts will be found on the ice side of the mountain. Beware. Give yourself plenty of room.

Fore and aft areas clear?

The F-16 pilot was headed for a close air support mission and just about to get in the cockpit when the crew chief asked if he planned to use a videotape on that mission. The pilot said that he did and asked the crew chief to install it for him.

The crew chief placed the tape on the ledge above the lip of the intake and then climbed back up the ladder to help the pilot strap in. The crew chief then removed the ladder, confirmed "Fore and aft areas clear," and the engine was started.

Later, after the F-16 made its takeoff, the crew chief remembered the tape but couldn't recall where he had placed it. A thorough search around the shelter, taxiway and EOR (end-of-runway) area didn't turn up the missing tape. The SOF was notified and he recalled the suspect aircraft. Fortunately, no abnormal engine conditions occurred during the flight and the mission was concluded safely. Evidence of engine damage and burned pieces of videotape were found inside the engine.

The main problem was that the pilot in question didn't comply with the intent of the F-16 preflight inspection checklist. It's the pilot's responsibility to ensure that the videotape is properly installed and the VTR door secured. No matter who does the job, the pilot is responsible. Period.

The crew chief in this story had a couple of responsibilities, too. The first was to ensure that the aircraft and the areas around it were clear of anything that would prevent a safe engine start. Apparently he didn't check close enough to notice the videotape still lying out loose.

He also had a second responsibility. He fulfilled that when he reported the missing tape instead of keeping his mouth shut. Attaboy!

AIRCREW OF DISTINCTION

Capt John F. Painter
120 TFS, 140 TFW
Buckley ANGB, Colorado

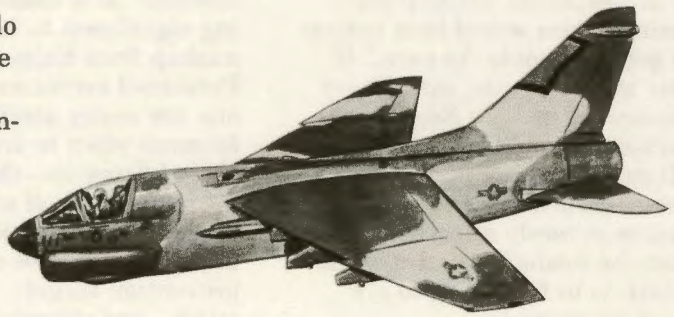
On 8 February 1985, CAPTAIN JOHN F. PAINTER was flying his A-7 over the Colorado Rockies near La Veta Pass when his engine rolled back to idle thrust. Flying 2,000 feet above the mountains at 450 knots when the problem occurred, Captain Painter immediately climbed to trade airspeed for altitude in an effort to reach Pueblo Municipal Airport, 43 miles to the northeast, for an emergency landing. Fortunately, the tops of the mountains near La Veta Pass are approximately 13,000 feet MSL and drop off rapidly towards Pueblo, Colorado, situated about 6,000 feet MSL.

The A-7's engine would not respond to any throttle movement and the EGT (exhaust gas temperature) remained at 300 degrees. Additional forward throttle movement further reduced the EGT as Captain Painter's altitude and airspeed began to bleed off. Fuel was dumped to extend range and preparations were made for a heavyweight landing.

Captain Painter chose to approach the Pueblo airport from the southeast in order to avoid the heavily populated areas of the city if he was forced to eject. Due to partial closure of the runway and lack of barriers, Captain Painter delayed configuration and used variable trailing edge flaps to adjust his airspeed.

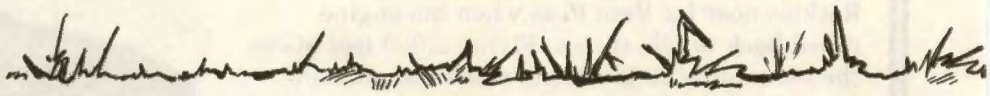
Upon landing the generator failed, leaving no antiskid or nosewheel steering. Using differential braking, Captain Painter brought the aircraft to a safe stop.

Captain Painter's calm, efficient display of airmanship saved a valuable aircraft and avoided potential disaster to a civilian community.



ACCIDENTS DO JUST HAPPEN

SMSgt Ed Hartman
HQ TAC/SEWE



"Accidents don't just happen; they are caused." How often have we heard this? What causes an accident? Many studies have been made and numerous books printed on the subject. Let's look at two causes of mishaps: carelessness and thoughtlessness.

The word carelessness has been used so often that people almost always use it as a mishap cause when no other obvious reason can be found. Arm chair safety experts would name carelessness as the cause of all accidents. Mishap prevention then would be a matter of getting people "to care." If this were the case, mandatory screenings of *Love Boat* for all personnel would probably solve all our safety problems. The use of carelessness in mishap causes severely affects the purpose for mishap investigations which is to find ways to prevent recurrences.

Consider, as an example, a load crew chief locking a MK 82 bomb in a bomb rack. He lowers the bomblift table too far before performing a "shake check" to see if the bomb is locked in. When he shakes the bomb, it unlocks from the rack, bounces off the MJ-1 table and lands on his leg, breaking it. One could say he was "careless" and this was the cause of the accident. It's obvious that there was neglect on the part of the crew chief but to say he didn't "care" would be incorrect. He probably cares a lot about the pain and suffering he is enduring, not to mention the explanations he'll have to give.

The use of the word "carelessness" as a cause offers nothing significant to help keep the mishap from happening again. Personnel errors such as this one are easily ascribed to carelessness when in truth it is *thoughtlessness*—the limited or incomplete use of sound mental judgement. If this is a factor in mishap causes, we now have a prevention target—the human mind—and corrective actions can be taken. This may include improvement of habits, training or concentration.

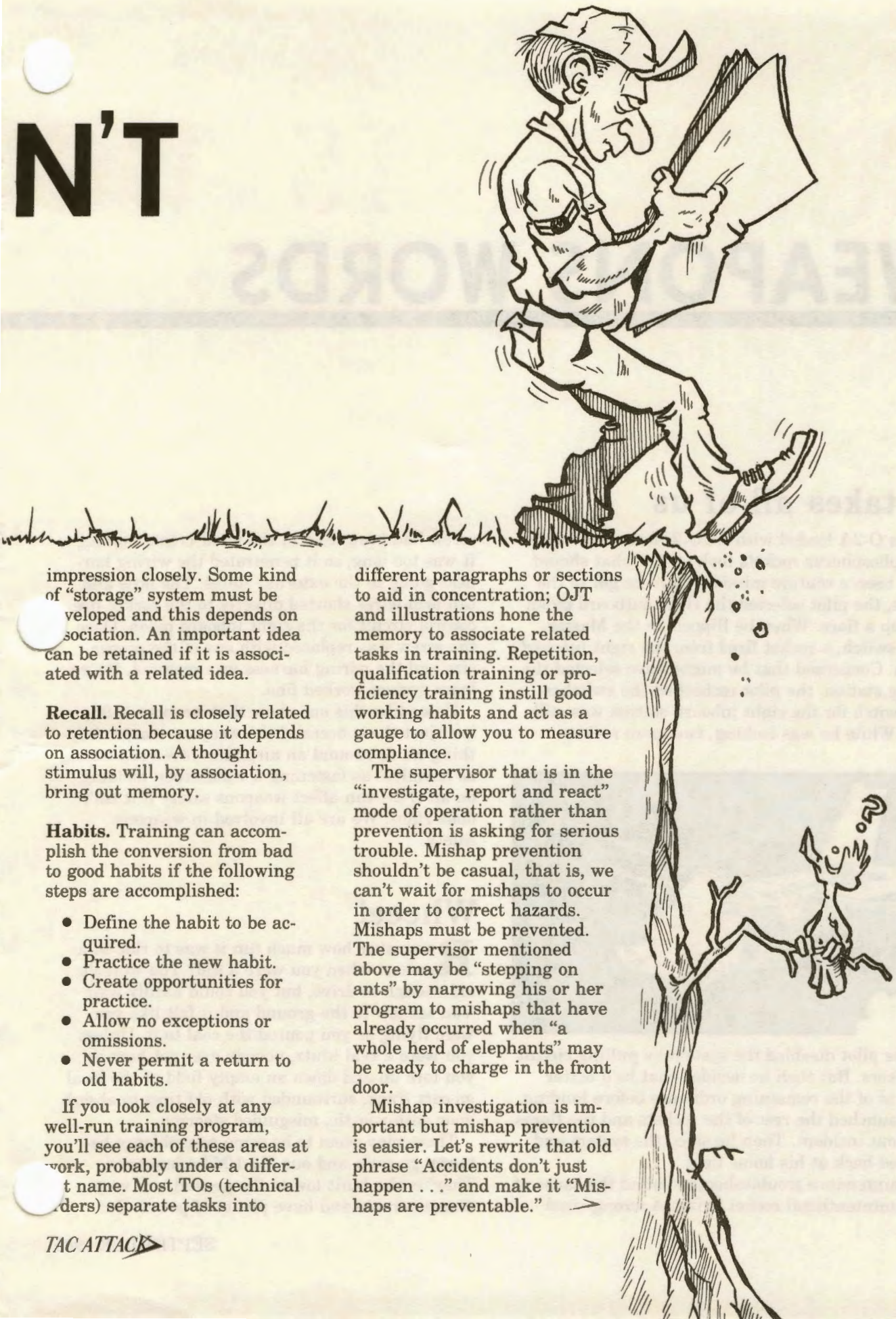
Concentration. Concentration is the ability to think of many related items, one at a time, which revolve around a single event without drifting so far away that contact with the main event is lost altogether. Lack of concentration can be caused by the presence of too many related tasks, lack of interest or worry and fear. Corrective actions that may be applied could be smaller task groupings, increasing job interest among workers and removing worrying workers from the job until the reasons are understood and the situation remedied.

Training. Training is an attempt to organize and develop a pattern of activity for an individual. Training is no better than the memory of the one who is trained. It involves three phases: impression, retention and recall.

Impression. Impression depends on how clearly an object enters the senses and is translated into an idea.

Retention. Retention follows

N'T



impression closely. Some kind of "storage" system must be developed and this depends on association. An important idea can be retained if it is associated with a related idea.

Recall. Recall is closely related to retention because it depends on association. A thought stimulus will, by association, bring out memory.

Habits. Training can accomplish the conversion from bad to good habits if the following steps are accomplished:

- Define the habit to be acquired.
- Practice the new habit.
- Create opportunities for practice.
- Allow no exceptions or omissions.
- Never permit a return to old habits.

If you look closely at any well-run training program, you'll see each of these areas at work, probably under a different name. Most TOs (technical orders) separate tasks into different paragraphs or sections to aid in concentration; OJT and illustrations hone the memory to associate related tasks in training. Repetition, qualification training or proficiency training instill good working habits and act as a gauge to allow you to measure compliance.

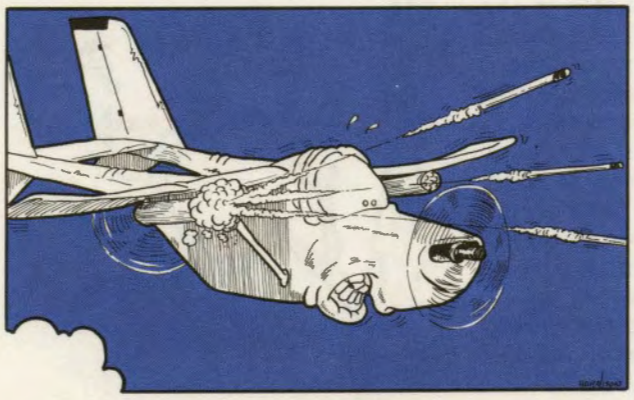
The supervisor that is in the "investigate, report and react" mode of operation rather than prevention is asking for serious trouble. Mishap prevention shouldn't be casual, that is, we can't wait for mishaps to occur in order to correct hazards. Mishaps must be prevented. The supervisor mentioned above may be "stepping on ants" by narrowing his or her program to mishaps that have already occurred when "a whole herd of elephants" may be ready to charge in the front door.

Mishap investigation is important but mishap prevention is easier. Let's rewrite that old phrase "Accidents don't just happen . . ." and make it "Mishaps are preventable." →

WEAPONS WORDS

It takes all of us

An O-2A loaded with LUU-2 flares and white phosphorus rockets took off for what should have been a routine mission. Once he got to the range, the pilot selected the right outboard pylon to drop a flare. When he flipped on the Master Arm switch, a rocket fired from the right *inboard* pylon. Concerned that he might have selected the wrong station, the pilot rechecked the switches: the switch for the right inboard station was still safe. While he was looking, two more rockets fired.



The pilot disabled the system by pulling circuit breakers. But then he decided that he'd better get rid of the remaining ordnance before landing. He launched the rest of the rockets and the flares without incident. Then he safed the system and landed back at his home field.

Maintenance troubleshooters found the cause of the unintentional rocket firing. A wrong-sized screw had been used in the windscreen molding. It was too long, so it penetrated the wiring harness going to the external stores. The nose and tail arm wires shorted directly to the rocket fire control circuit for the right inboard pylon. Once the screw was replaced with one of the proper size and the wiring harness was repaired, the release system worked fine.

Cases like this one show that weapons safety isn't just the concern of the weapons troops. Anything we do around an airplane—even something as harmless as fastening a windscreen molding on an O-2—can affect weapons safety if it isn't done right. We are all involved in weapons safety.

Wheee!

Remember how much fun it was to ride in a go-cart when you were a kid? You weren't old enough to drive, but you could hardly wait. You sat low to the ground and it felt like you were flying as you poured the coal to it. Unless you were a real klutz, nobody ever got hurt as you tore up and down an empty field or the local go-cart track, surrounded with old tires to absorb your enthusiastic, misguided steering.

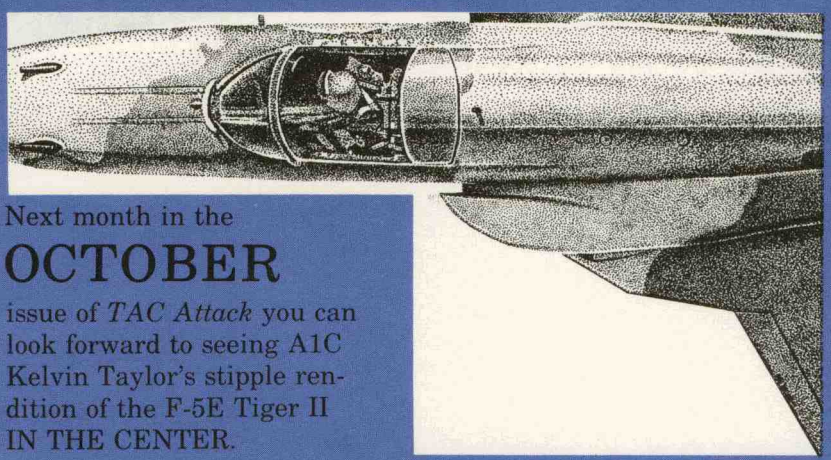
There may seem to be some resemblance between go-carts and our MJ-1/MJ-4 jammers. They're also built low to the ground, are very maneuverable and have plenty of power. But,

that 's where the comparison stops.

When an MJ-1 driver was helping load AGM-65 Mavericks, he discovered that driving a ammer too fast could be a problem. He approached the aircraft with the Maverick, thinking he had enough room to drive straight in. As he accelerated toward the aircraft, it quickly became obvious to both the load crew chief and the spotter that the driver was going too fast. Misjudging his speed and clearance, the driver caused the missile to hit one of the aircraft's MAU-12 ejector rack sway braces and the missile was severely damaged.

Bomb lifts are serious pieces of Air Force ground equipment, not go-carts. We may want to catch the old thrill of the go-cart or be tempted to go beyond safe limits during ICTs (integrated combat turnarounds) or bomb load competitions. Resist the temptation and know your own capabilities for driving and maneuvering around aircraft, munitions trailers, AGE and other members of your load team. An unnecessary ding will lose a bomb comp for you and ruin the rest of your day.

HEADS UP



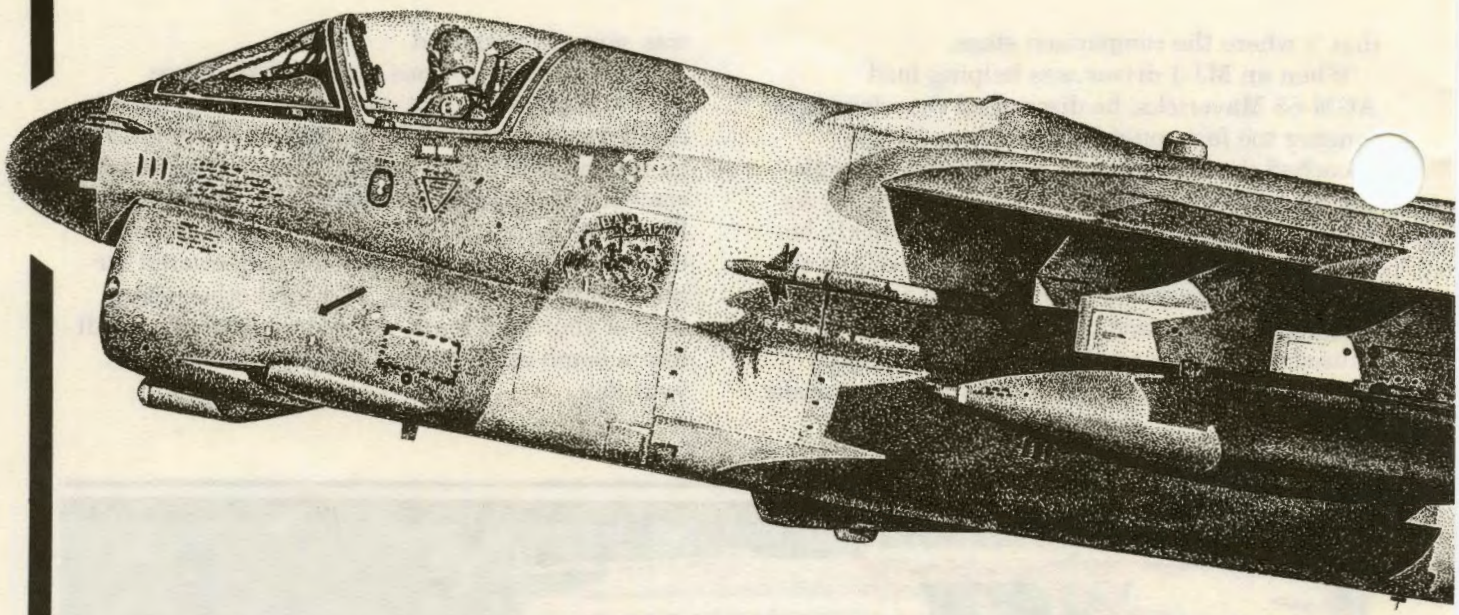
Next month in the

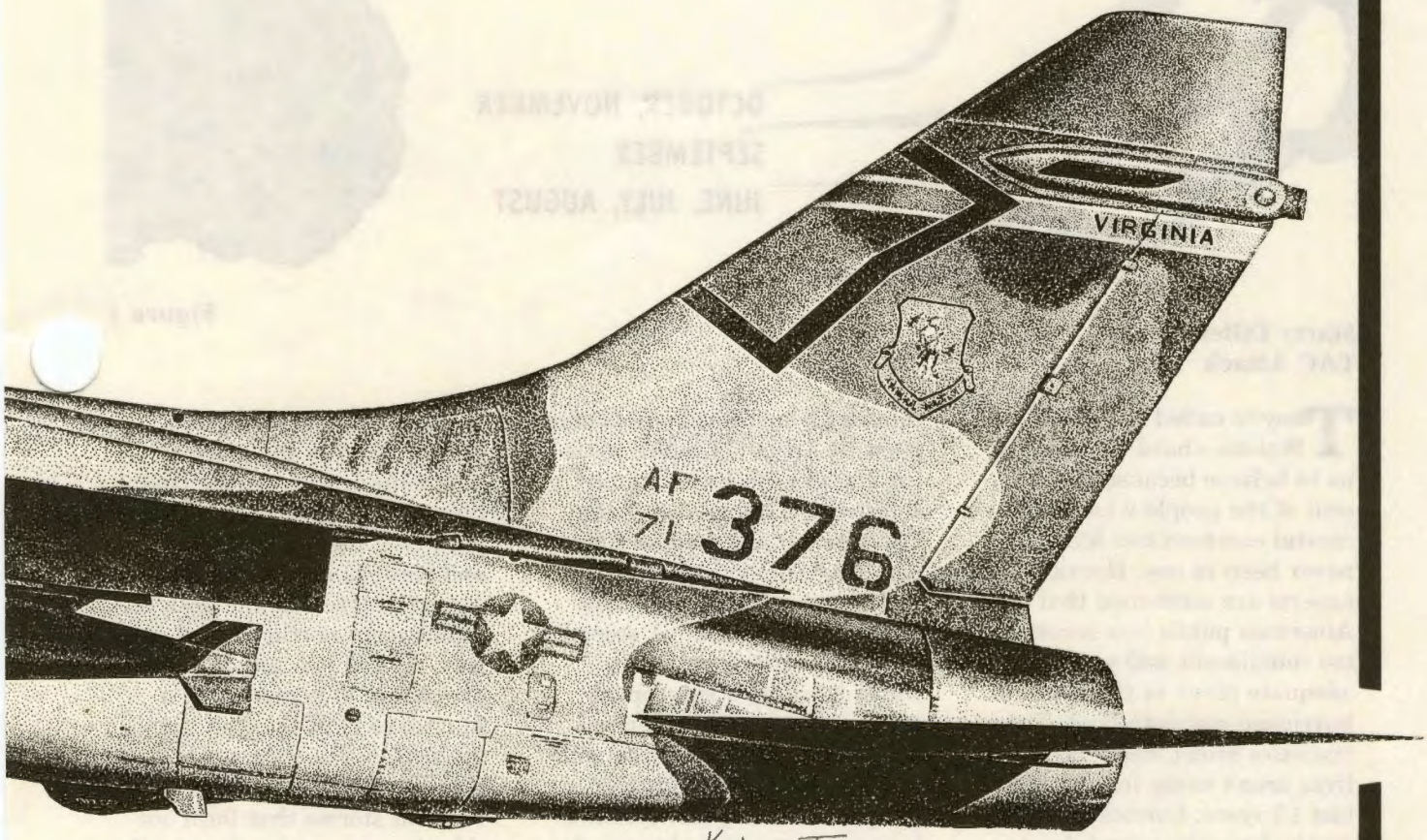
OCTOBER

issue of *TAC Attack* you can look forward to seeing A1C Kelvin Taylor's stipple rendition of the F-5E Tiger II IN THE CENTER.

In the July Heads Up, we solicited your guesses on a suitable animal namesake for the A-7 SLUF. The contest is over and we had some exciting suggestions ranging from a chipmunk to a cross between a buffalo and something else. Unfortunately, there were no "weeners" but we thank all of you, TAF-wide, who gave it a shot. We hope you enjoy the A-7 In The Center.

A-7D CORSAIR II





KELVIN TAYLOR

HURRICANES–

the greatest storms on Earth

Figure 1

Marty Diller
TAC Attack

They're called the Great Storms—hard for many of us to believe because 85 percent of the people who live in coastal communities have never been in one. Hurricane experts are concerned that the American public has become too complacent and won't make adequate plans in the event a hurricane comes to land. The statistics aren't much help: lives aren't being lost. In the last 15 years, hurricane-related deaths have decreased due to better hurricane forecasting; yet property damage, because of significant population growth in the Sun Belt, has increased to $1.4 billion. Could you survive a hurricane?

What's a hurricane?

Hurricanes (which are tropical cyclones and are also called typhoons) are low-pressure systems with sustained winds of at least 64 knots (74 mph), rotating counter-clockwise around a relatively calm eye, or center. These small and intense lows usually form over warm tropical water and dissipate over land or cooler water. A storm that forms over nontropical water is called a subtropical cyclone. The major difference between a tropical cyclone and a subtropical cyclone is core temperature: tropical cyclones have warm cores; subtropical, cold cores. All hurricanes have warm cores. Tropical cyclones that form in the North Atlantic, East and Central Pacific are called hurricanes; in the West Pacific they're typhoons; the South Pacific and Indian Ocean, tropical cyclones; hurricanes never form in the South Atlantic.

The normal hurricane season is June through November. Figure 1 shows the general hurricane tracks. At the beginning of the season, the average path is at its most southern and western extent. As the season progresses, the path becomes more northerly and easterly. As you can see, the greatest chance of being hit by a hurricane is in the first half of the season; the East Coast's greatest threat is in September. Tropical storms that form outside the average tracks usually do so very early or very late in the season.

Figure 2 shows average characteristics of a hurricane; some have wide ranges. For example, the diameter of hurricane force winds can range from 10 to 200 miles, depending on the strength of the storm. The forward speed is an average of 10 knots (12 mph),

but when the storm curves north above 30 degrees latitude, the speed often increases to an average of 28 knots (32 mph). The average lifespan is 9 days; in August the average is 12 days; July and November, 8 days.

Figure 2
Typical Characteristics
Windspeed: 90–100 knots (104–115 mph)
Hurricane force winds (diameter): 100 miles
Gale force winds (diameter): 350–400 miles
Eye (diameter): 14 miles
Vertical extent: 40,000 feet
Forward speed: 10 knots (12 mph)
Lifespan: 9 days

There are four stages in hurricane development: **tropical disturbance** (very light surface winds), **tropical depression** (surface winds less than 34 knots [39 mph]), **tropical storm** (surface winds 34–63 knots [39–73 mph]) and **hurricane** (sustained surface winds 64 knots [74 mph] and greater). A storm is downgraded and upgraded as winds diminish or reintensify.

When the windspeed of a **tropical storm** reaches 34 knots (39 mph) (in the Atlantic and East Pacific), the National Hurricane Center in Miami, Florida, gives it a name. Name lists have been established for five-year periods and repeat when a period ends. Significant hurricane names are retired and replaced with another. Storms in the Central and West Pacific use a different set of names.

Hurricane conditions (or hazards) include a **storm surge** (waves in excess of 20 feet at the coastline), **high winds** (greater than 135 knots [155 mph], usually sustained at the highest speeds on the right forward quadrant [3 o'clock position]), **heavy rain** (6–14 inches) and **tornadoes** (numerous, widespread, usually occurring further inland).

The storm surge is the worst hazard, causing 9 out of 10 hurricane-related deaths. It's a combination of the astronomical tide (normal, high/low tides) plus the wall of water brought in by the storm. (The barometric pressure gets so low in the eye of a hurricane that the seawater is actually sucked up into the eye and forms a giant wall of water.) The stronger the hurricane, the more powerful the storm surge. Winds (including tornadoes) cause about ¼ total deaths and ⅓ total damage. Flooding accounts for ⅔ of the damage and ¾ of the deaths.

Hurricanes are ranked according to sustained windspeed and storm surge:

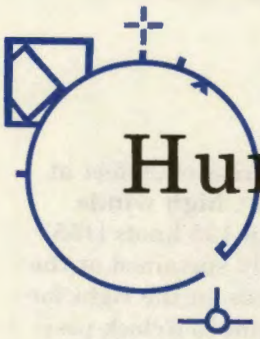
- Type I—windspeed 65–83 knots (75–95 mph); storm surge, 4–5 feet.
- Type II—windspeed 84–96 knots (96–110 mph); storm surge, 6–8 feet.
- Type III—windspeed 97–113 knots (111–130 mph); storm surge, 9–12 feet. A major hurricane starts at Type III.
- Type IV—windspeed 114–135 knots (131–155 mph); storm surge, 13–18 feet.
- Type V—windspeed greater than 135 knots (155 mph); storm sturge greater than 18 feet.

Major Hurricanes Affecting the U.S. Coast by Month (1900–1984)

	June	July	August	September	October
Alabama		1		3	
Connecticut			1	2	
Delaware					
Florida		1	1	14	5
Northwest		1		4	
Northeast					
Southwest			5	3	
Southeast			1	7	2
Georgia					
Louisiana	2		3	4	1
Maine					
Maryland					
Massachusetts				2	
Mississippi		1	1	1	
New Hampshire					
New Jersey					
New York			1	3	
North Carolina			1	5	1
Rhode Island			1	2	
South Carolina				2	1
Texas	1	1	7	6	
North	1	1	3	2	
Central			2	1	
South			3	3	
Virginia				1	
U.S. Total (%)	2 (4%)	2 (4%)	13 (23%)	31 (56%)	7 (13%)

Forecasting

Hurricane forecasts come



Hurricanes

from the National Hurricane Center which provides advisories and has sole responsibility to issue a hurricane warning. A forecast includes present location and windspeed as well as projected path and windspeed at 12-hour, 24-hour, 48-hour and 72-hour intervals. Forecast position is based on eye location.

While satellites, radar and weather reconnaissance aircraft allow us to identify and track hurricanes fairly accurately, forecast error can be large, increasing significantly with time. Average errors are 51 NM at 12 hours, 109 NM at 24 hours, 244 NM at 48 hours and 377 NM at 72 hours. For example, if the hurricane eye is forecast to pass over a certain point on the coastline at the 24-hour interval, actual location of the eye is off as much as 109 NM on the average.

Forecasting is expected to improve over the next decade. Over-land data collectors are numerous and provide excellent information; however, more over-water collectors are necessary (now, over-water data comes from ship reports). Satellites tell us where a hurricane is. They are also being used to gather over-water information, much of which is qualitative.

Forecasting is tricky. When and where to give a hurricane warning is very complex. Too much lead time causes complacency. Too little lead time doesn't allow enough time to evacuate. And an area that is over-warned finds it hard to believe subsequent warnings. Preparations for a hurricane are costly, estimated at about $150,000 per mile of coastline.

Warnings

Warnings are issued to initiate plans of action. They start with a tropical depression. Advisories are issued from the Hurricane Center every 6 hours (EDT, 6 a.m., noon, 6 p.m. and midnight). An additional public advisory is also issued at 10:30 p.m. More frequent advisories are issued according to storm severity.

The official source of all weather data for units on a base is the base weather station. It only provides information. The wing/base commander decides when to evacuate. Civilian communities work the same way. Information is given to local and state officials and it's up to them to take action.

The Air Force's warning system is slightly different from the public system. The Air Force issues HURCONs:

- HURCON IV—72 hours until 50-knot (58 mph) winds
- HURCON III—48 hours until 50-knot winds
- HURCON II—24 hours until 50-knot winds
- HURCON I—12 hours until 50-knot winds.

The public system issues a **hurricane watch** first, which means hurricane conditions may threaten your area. A **hurricane warning** is issued when hurricane force winds and storm surge are expected within 24 hours.

Be ready

Plans have been made and are in writing. All military personnel should review their base OPlan 355-1, which is the disaster preparedness plan. Also, check to see if your base has a Hurevac 55-4 and review it. Off base, contact your local emergency services office (could also be called civil defense or disaster preparedness).

Preparing for a hurricane can be difficult and time consuming if you wait until the last minute. When a *hurricane watch* is issued, officials will be busy and won't be able to answer requests for information. Get your information ahead of time—now. You'll need to know—

- History of storm surge and flooding in your area and on base.
- Elevation of your property or base.
- Flood insurance—are you covered?
- Evacuation routes and location of shelters on and off base.
- How to secure your home and area where you work on base.
- What emergency supplies are needed if you stay in your home or on base.
- How to plot a hurricane on a map; have a map of your area on hand.

More information about preparing for a hurricane can be found in Down-to-Earth, pages 26 and 27. >

TAC Individual Safety Award

SSGT MARY J. LAMBERT's distinctive accomplishments as the squadron's safety NCO are numerous and outstanding.

One of Sergeant Lambert's initiatives was to provide her people quality safety information. She established a standardized safety management workbook for all her workcenters and researched the requirements for AFOSH job safety training to build a more comprehensive program. A squadron policy was developed to require weekly documented safety briefings that included off-duty hazard information. Her monthly meetings of all workcenter safety reps provide the most up-to-date information as well as providing a forum for information crossfeed between sections.

When the deputy commander for maintenance directed that a motorcycle program be implemented, Sergeant Lambert was the first safety NCO to come up with a feasible plan. Monthly meetings with motorcycle monitors are used to brief policy changes, to keep the monitors informed of newcomers so they can check for adequate motorcycle training and to discuss problem areas. Since this program has been established, none of the 78 motorcycle riders in her squadron have had a reportable accident.

SSgt Mary J. Lambert
27 CRS, 27 TFW
Cannon AFB, New Mexico

Sergeant Lambert has also developed self-inspection checklists for workcenters and conducts comprehensive spot inspections geared to assist NCOICs in detecting hazards.

TAC Special Achievement in Safety Award

SSgt Jeffery A. Mayer

SrA Anthony C. Marci

SrA Duke E. Johnson
405 CRS, 405 TTW
Luke AFB, Arizona

SSGT JEFFERY A. MAYER, SRA ANTHONY C. MARCI and SRA DUKE E. JOHNSON saved a valuable aircraft and expensive equipment by extinguishing a fire during an engine test run.

They were troubleshooting an aircraft for auto-acceleration. Sergeant Mayer was in the control cab on the trim box, Airman Marci was running the aircraft and Airman Johnson was the ground observer. The right engine started with no problem, but as Airman Marci attempted to start the left engine, Airman Johnson noticed a thick fog coming from the tailpipe of the #1 engine. Airman Johnson immediately informed Airman Marci of the condition.

A fire started on the #1 engine before Airman Marci could start emergency procedures. Sergeant Mayer immediately called the fire department, then assisted Airman Johnson in fighting the fire from the rear with halon while Airman Marci continued to motor the engine.

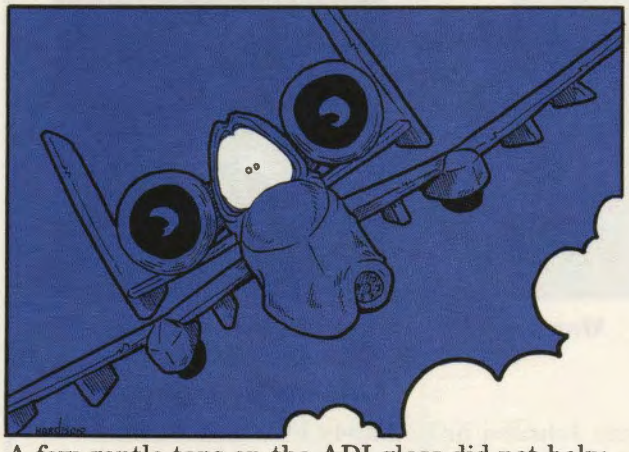
After depleting two fire extinguishers and motoring the engine for several minutes, the fire was extinguished.

CHOCK TALK

chock talk incidents and **INCIDENTS AND**

Main ADI failure—not MDRed

While flying night instrument patterns, an A-10 pilot noticed his main attitude indicator (ADI) had gone Tango-Uniform. The main ADI showed wings level, but the standby indicator said he was in a 30-degree right bank. A thorough crosscheck of his instruments and awareness of where he was in the pattern confirmed that he was, indeed, in a 30-degree bank.



A few gentle taps on the ADI glass did not help; so the pilot landed, using the standby.

When the broken ADI was removed, it was supposed to be MDRed (materiel deficiency report) so it could be taken apart and sent to depot to determine the cause of the inflight failure. It didn't happen that way. Somehow the ADI was returned to supply. No MDR was ever submitted. A thorough search of supply channels could not turn up the faulty part.

The loss of the broken attitude indicator prevented the collection of vital information that might help prevent future problems and maybe even an accident. The MDR system is intended to help the folks at the air logistics centers gather data to spot trends on malfunction-prone parts and equipment. It may also help to correct design problems that only become obvious after extended use in the field. The only way these problems can be documented is for those who work around the jets to write up the part that malfunctions.

This time the malfunction occurred in a controlled, stable environment with no serious consequences. The next time it could be at night on a low-level route with fatal results.

Wise on cracks

An aero club maintenance chief was repairing a flat tire on a Cessna when he noticed a crack in the engine mount where it is welded to the nose gear lower mount yoke. After grounding that aircraft, he inspected six other planes and found cracks in the same area on four of them.

The cracks were in a position on the mount where the nose gear would collapse if a complete fracture should occur. It was unknown whether

hard landings or torque caused by high power settings during magneto checks or takeoff rolls had caused the problem. No manufacturer's letter or airworthiness directives had been published on the potential hazard.

This fellow prevented a potential problem in several valuable aircraft because he was looking at the entire area where he was working, not just at the flat tire. Keep an eye out for problems that may not have come to light. You may be the first person in the right place to keep a much more serious problem or loss from occurring.

The price is *not* right!

If one part is designed to do the job, won't another piece that fits do just as well? Don't count on it.

An F-16 pilot saw the results of such a swap during takeoff. Passing 260 knots and only 100 feet above the ground, his ears were filled with the sweet music of "Caution, Caution" accompanied by the Overheat and Caution lamps illuminating. The pilot requested a closed pattern for an immediate landing and was then greeted by "Warning, Warning" and the addition of a fire warning light. When the aircraft had climbed into position for a simulated flameout approach, he brought the throttle back to idle and landed uneventfully.

Troubleshooters found that the thirteenth stage bleed air valve duct had come apart at the aft clamp, allowing *hot* air to blow onto the overheat and fire sensing loops. This occurred because the installed clamp was designed to fit on the *seventh* stage bleed air duct. It was one inch larger in diameter than the one required. It was impossible to determine when the erroneous clamp was installed and very difficult to discern the error once the incorrect clamp was in place.

While the switched clamps may have seemed

CHOCK TALK

very harmless at the time, this error in judgment and procedure resulted in an unnecessarily exciting ride for the pilot as well as over $5,000 damage and a trip to the depot for the jet. The clamps may have been similar in size, but the cost difference would have aroused Congressional attention.

"O.K! What's really in there?"

Two O-2 pilots passed their color vision test when they preflighted their dual-propper after an overnight stay at a cross-country base. During their walk-around, one pilot noticed orange fuel in both main tanks which didn't match the blue fuel remaining in the auxiliary tanks from their first sortie. The 781 indicated that the aircraft had been filled with JP-4 which is colorless so it was obvious that something wasn't right.

Analysis of the fuel in the main tanks showed that it would probably turn the O-2 into a high-powered, dual-capable lawnmower shortly after takeoff since the orange liquid was MOGAS. If you're new to the AF, that's auto gas.

Fortunately, this mistaken fuel load was caught by a thorough preflight before it became much more serious. Fuels and other aviation liquids are colored for a good reason — ready identification. But we have to take the time to notice.

Oops

Psst. Hey, Buddy . . . wanna buy a cow? No? Well then, how about a church or a Buick or a hen house or a child? Yep, that's right . . . you can be the proud owner of a slightly damaged version of any of these items. All ya gotta do is botch up your job of attaching a panel, canopy, fuel tank, bomb or whatever to a USAF aircraft.

Hey, you aircrews can play too. Just do a casual preflight or flip a switch without thinking.

Now it takes a little bit of luck, of course; most of the objects we drop from aircraft don't hit anything of value. But when one does, it's yours!

Oh yeah, you get to be famous for a while too.

One fastener doesn't get it

An A-7 on a cross-country flight was being launched by transient maintenance. Preflight activities had been normal up to engine start. But when the pilot tried to start the jet-fuel starter (JFS), he couldn't get it running. The battery also appeared to be weak.

The pilot climbed out of the cockpit while maintenance work was done on the JFS. The maintenance workers opened the left and right avionics bay panels and the access panel forward of the JFS exhaust area to work inside. Then the pilot climbed back into the cockpit to see if the JFS would start. When he tried, it started up. So the transient maintenance workers on the ground told him to stay in the cockpit; they'd take care of buttoning up the panels.

The pilot started the engine and shut down the JFS. He finished his cockpit checks and taxied. The same transient maintenance crew met him at the end of the runway and gave him his last-chance quick check. After getting a thumbs-up from the ground crew, the pilot took off and flew to his destination. There he discovered that the left avionics bay panel was missing.

The panel hasn't been found. But on the airplane, the female portions of the panel fasteners were not damaged—except for one. That fastener was the center fastener on the aft edge of the panel. Do you suppose that the reason it was damaged was because it was the only one fastened?

TAC Ground Safety Award of the Quarter

SSgt Jayne K. Bayne has been the squadron's additional-duty ground safety NCO since February 1984. Her commander says she is the best safety NCO of the 32 subordinate and tenant unit safety representatives on the base. And that's not all. Her squadron received the only outstanding rating from wing ground safety in the last annual inspection.

Sergeant Bayne has significantly increased safety awareness in her squadron. She developed workcenter safety books that contain accident reporting procedures, safety briefing items and job safety guidelines. She also developed an incident investigation worksheet and placed it in such a way that mishap notification and follow-up investigation have become more timely. When a mechanic almost lost an eye because he was using a trailer hitch tongue as a wrench extender to gain additional leverage, she had an article published in the base newspaper to increase awareness of the seriousness of using tools incorrectly.

Sergeant Bayne is very adept in spotting hazards and getting them corrected. During a recent operational readiness exercise, she discovered that exit doors in a bomb shelter were padlocked,

SSgt Jayne K. Bayne
4 AGS, 4 TFW
Seymour Johnson AFB, N. Carolina

making rapid escape impossible in the event of a fire. She brought the problem to the attention of ground safety and asked them to check other bomb shelters for the same problem. She also corrected a hazard she found in her AMU storage area: inlet guide vane and afterburner manifold leakage testers, each holding one and a half gallons of fuel, were being stored in a "smoking area." The testers were immediately moved.

TAC Weapons Safety Award of the Quarter

MSgt Timothy Stalcup's initiative in the development of a comprehensive weapons safety program has resulted in flawless, error-free maintenance.

Sergeant Stalcup revamped the self-inspection program checklist to include all aspects of weapons/explosives safety to ensure adequate safeguards to protect personnel and equipment. He personally evaluated 400 items in this program, researching references, adding inspection requirements not previously covered and relocating inspection items under proper functional areas. This program was commended by the TAC maintenance standardization evaluation team as in-depth and extensive.

Three hundred explosives items have been processed and repaired in the shop without an incident during this quarter. Sergeant Stalcup identified, developed and implemented a training program to train all armament shop specialists on the installation, removal and functional checkout of the M61A1 gun system.

Sergeant Stalcup's identification of deficient

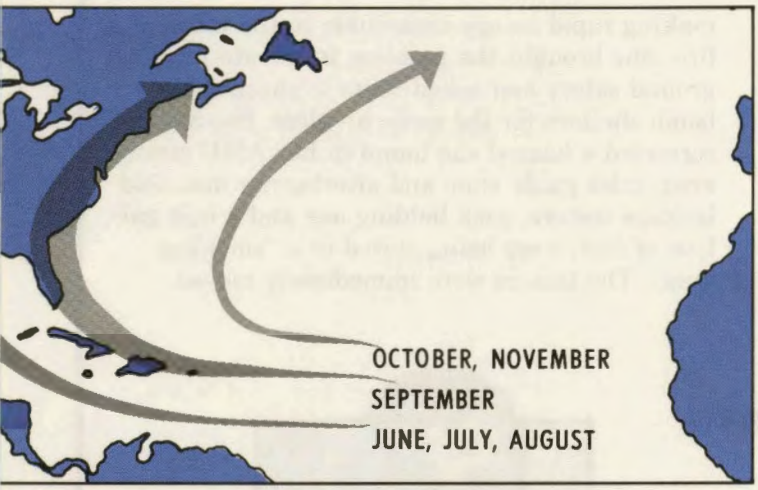
MSgt Timothy Stalcup
405 EMS, 405 TTW
Luke AFB, Arizona

20-mm shell cased TP ammunition while chambering into the F-15 aircraft prevented severe damage to the system. This ammunition caused several jammed gun systems during loading operations. His coordination and tracking of ammunition lot numbers readily identified the deficient rounds.

Sergeant Stalcup's efforts have made this section the most reliable and safety-conscious section in the 405 TTW. His performance has clearly earned him a second TAC Weapons Safety Award of the Quarter.

DOWN TO EARTH

ITEMS THAT CAN AFFECT YOU AND YOUR FAMILY HERE ON



Prepare for a hurricane

When a watch is issued

- Check supplies:
- Transistor radio with fresh batteries. Have enough batteries to last several days.
- Flashlights, candles or lamps, matches. Store matches in waterproof container. Have lantern fuel for several days. Know how to use safely.
- Full tank of gasoline. Fill your vehicle up as soon as a hurricane watch is issued. When there is no electricity, gas pumps won't work.
- Canned goods, nonperishable foods and a nonelectric can opener. Store packaged foods that don't need to be cooked or refrigerated.
- Containers for drinking water. Have clean, airtight containers to store sufficient drinking water (1/2 gallon/person/day) for several days.
- Materials to protect glass openings. Have shutters or lumber for large windows and doors and masking tape for small windows.
- Materials for emergency repairs. Your insurance policy may cover cost of materials used in temporary repairs, so keep all receipts. These will also be helpful for any income tax deductions.
- Fire extinguisher.
- Prepare a separate survival kit to take if ordered to evacuate that includes: first-aid kit, nonperishable foods, eating utensils and can opener, bottled water (1/2 gallon/person/day), medications, eyeglasses, hearing aids, batteries, radio, flashlight, diapers and formula, sleeping bags or blankets, change of warm clothing, ice cooler with ice and lightweight folding chairs (in case you wind up at a shelter).
- Refill prescription drugs.
- Make arrangements to stay with relatives or friends further inland if ordered to evacuate—use shelters as a last resort.
- Make arrangements for pets—they can't go to shelters.

When a warning is issued

- Listen constantly to radio. Plot hurricane position on a map as advisories are given. Discount rumors and use telephone sparingly.
- If you live in a mobile home, check tie-downs and leave immediately for a safer place.
- Prepare for high winds. Brace your garage door, lower antennas. Be prepared to make repairs.
- Anchor or bring in outside objects: garbage cans, awnings, loose garden tools, toys and lawn furniture.
- Protect glass openings. Board up or shutter large windows. Tape exposed glass to reduce

shattering. Draw drapes across windows and doors to protect against flying glass.
- Move boats on trailers close to house. Fill boats with water to weight them down. Lash securely to trailer and use tie-downs to anchor trailer to the ground or house.
- Check mooring lines on boats in water, then leave them.
- Store valuables in waterproof containers. Prepare for tornadoes and floods.

If you remain at home
- Stay indoors. Don't go out in the brief calm during passage of the eye of the storm. The lull sometimes ends suddenly as winds return from the opposite direction. Winds can increase in seconds.
- Protect property. Without taking any unnecessary risks, protect your property from damage. Temporary repairs can reduce your losses.
- Stay away from windows and glass doors.
- Stay on leeward, or downwind, side of house. As wind directions change, move to another room. If you home has a room with no outside walls, stay there during the height of the hurricane.
- Keep radio tuned for information from official sources. Unexpected changes can sometimes call for last-minute evacuations.
- Don't use electrical appliances.

If you must evacuate
- Secure your home and leave immediately.
  - Shut off gas valves.
  - Pull main electrical switch.
  - Turn off main water pipe.
  - Open a window slightly.
  - Take important papers with you.
  - Fill swimming pool full and super chlorinate.
  - Lock windows and doors.
- Leave early in daylight. Don't travel farther than necessary. Dangerous winds and tides may arrive 3 to 5 hours before the hurricane.
- Take survival kit.
- Keep important papers with you at all times: driver's license and other identification; insurance policies, property inventory, medic-alert.

After the hurricane
- Beware of outdoor hazards. Look for loose or dangling power lines—report them immediately.
- Walk or drive cautiously. Debris-filled streets are dangerous. Snakes, insects and animals will be a hazard. Washouts may weaken road and bridge structures.
- Re-enter your home with caution. Repair immediate hazards. Open windows. Don't strike a match or use flame until you check for gas leaks.
- Guard against spoiled food. Food may spoil if refrigerator power is off more than a few hours. Freezers will keep food several days if doors are not opened. Do not refreeze thawed food.
- Do not use water until safe. Use your emergency supply or boil water before drinking until official word that the water is safe. Report broken sewer or water mains.

Clean-up
- Notify your insurance representative.
- Protect property. Make temporary repairs to protect property from further damage or looting. Keep all receipts.
- Be patient. Insurance reps will settle hardship cases first.

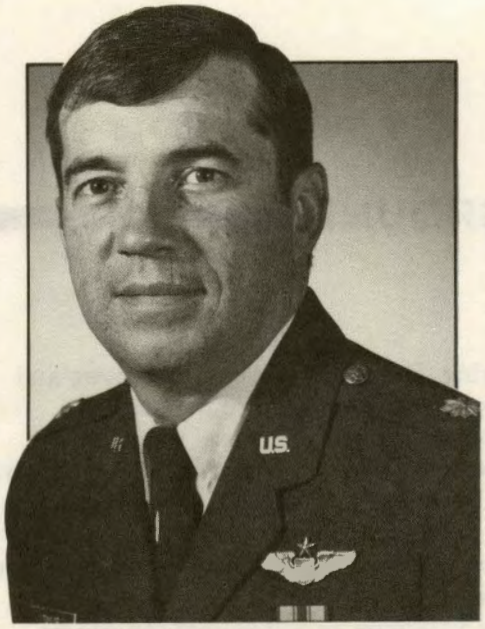
TAC FLIGHT SAFETY AWARD OF THE QUARTER

As the squadron's flying safety officer, MAJ JAMES B. TAYLOR has continually striven to make the safety program the best possible. His standards are high and he meets them.

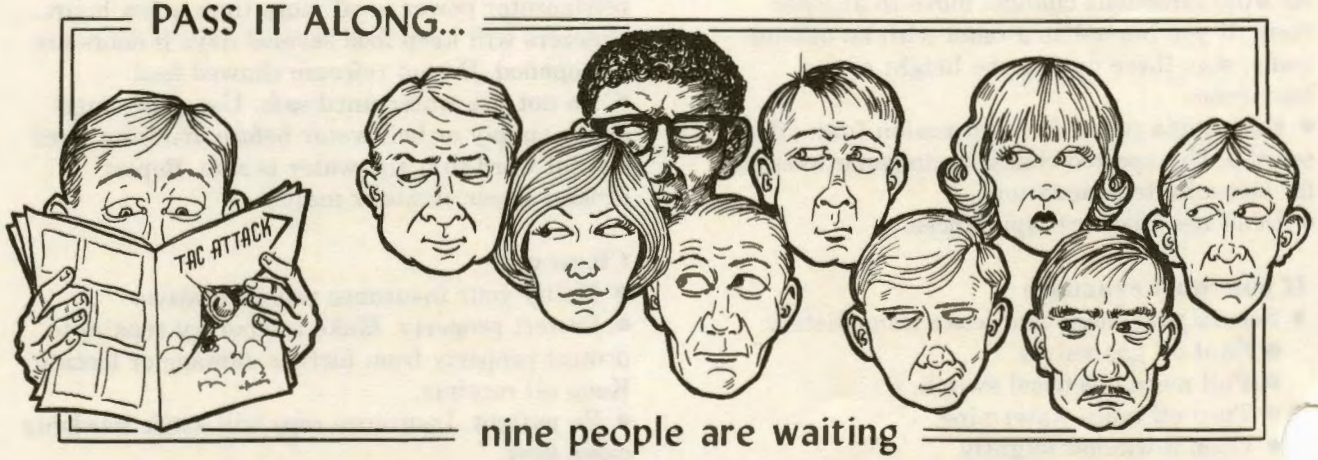
His work in mishap investigation is particularly noteworthy. G-induced loss of consciousness (GLC) that pilots sometimes experience is a problem of major concern. Major Taylor decided to do his own research and while examining the G-suit, discovered cracks in G-suit hoses. His finding could be a major contribution in combating GLC. His investigation of a nose-gear-up landing highlighted the need for a TCTO for alternate gear extension. His work in this investigation has helped expedite the compliance of the TCTO, which if not complied with, could allow about a 50-percent reliability factor when using the alternate gear extension.

Major Taylor developed a small computer program that tracks aircraft malfunctions. This information is helpful in giving up-to-date trend analysis data. His program has been used as the model for the entire wing.

The safety program in the 311 TFTS was called the best in the wing by the recent 12 AF staff assistance team. Squadron safety received an excellent rating on the last MEI and also on the last 832 AD annual safety inspection. →



Maj James B. Taylor
311 TFTS, 58 TTW
Luke AFB, Arizona



MIXING TAC FIGHTERS AND HEAVIES

Capt Lawrence R. Pratt
41 ECS
Davis-Monthan AFB, Arizona

TAC heavies—sounds almost like a contradiction in terms. With their increasing appearance around the world, sharing your airspace and ramp areas, every TAC aircrew member needs to be aware of TAC's *heavy* set: the E-3A AWACS, the EC-130E ABCCC and the EC-130H Compass Call.

Compared to the fleeing fighter you're used to running down, TAC heavies (especially the C-130 Herk) are extremely slow. While they may present an easy target, you're going to overtake them at a much greater rate than you're accustomed to. And, with eight-to-ten times the mass of a fighter, heavies are going to present a larger area to avoid—on low-levels as well as inter-pts. Another factor to be aware of is the avy's extremely limited visibility. Ability to check six from 4 to 8 o'clock is virtually nonexistent while vertical lookout is seriously restricted by the fuselage structure. Poor cockpit vis ibility and a limited ability to maneuver are inherent to TAC's heavy force. That puts the bulk of *see and avoid* on the shoulders of fast movers.

You'll find that heavies are even more of an operational factor in ground operations. Those of you who don't have heavies stationed at your home base may first experience this during Red Flag or a deployed exercise. You will notice that the heavies eat up (and heat up) more ramp space and turning room than any fighter. There's no clearance under a high-winged Herk for anything but an OA-37 (but don't try it). C-130s, in particular, have a tendency of kicking up dust and loose items that can create FOD and limit visibility. Look out for what might get blown your way. Finally, wake turbulence advisories (especially behind an E-3) are deserving of your full attention and respect.

As our exercises become more crowded and complex, TAC heavies will become a more frequent sight. More than ever it's a heads-up game out there.

EMERGENCY SITUATION TRAINING

Lt Col Jim Lentzkow
HQ TAC/DOV

SITUATION: You're lead of a four-ship, making formation takeoffs, 10-second interval, left turnout. Based on your Corsair configuration (two full 300-gallon fuel tanks and two MERs each with three BDUs), you can look for a takeoff speed of 157 KIAS and a 5,100-foot takeoff roll. The runway is 11,000 feet long with a BAK-14 cable at the departure end. Refusal speed is 151 KIAS. As you approach 140 KIAS, you hear a muffled explosion and the aircraft yaws very slightly to the left. Your left tire has failed. What now?

OPTIONS: A. ABORT. ANTISKID SWITCH — FULL AFT.
B. External load — jettison. **C.** Continue the takeoff (do not retract gear or flaps). **D.** A and B above. **E.** B and C above.

DISCUSSION: Since Option A is a boldface procedure, for many people it tends to become a natural reaction. It might not be the best one here. As you approach flying speed, directional control is probably good; but if you abort, directional control will probably deteriorate as you slow that heavy aircraft. Without antiskid braking, you could easily blow the other tire. There is a cable, but it's so far down the runway that you may not get to it because you may not be able to keep the aircraft on the runway.

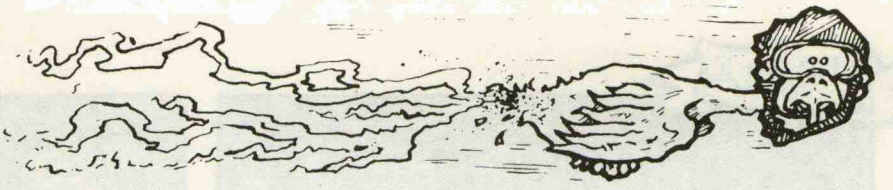
Option B is a gimme. If you abort the takeoff, you won't be able to jettison the fuel tanks because the landing gear is down. If you continue the takeoff, the same is true. Since most units fly with the MERs bolted on, jettisoning them is N/A. Even if the MERs were carted, you would gain very little by hitting the panic button.

If you picked Option C, I'm with you. With a blown tire on takeoff at high speed, it comes down to a choice between aborting a heavy aircraft with only half the runway remaining (and hoping your directional control is good enough to keep you on the concrete until you've stopped or until you get to the barrier) or flying a light aircraft into an approach-end arrestment. It's an easy choice for me — at high speed, continue. I pick a speed (usually about 20 knots below takeoff speed) that I use as my *tire failure* refusal speed; above that speed I will continue the takeoff with a blown tire.

But it's not that easy, you say. Isn't there a possibility of swerving into your wingman if you continue? I think not. That's why a good wingman maintains adequate wing-tip clearance. A collision is more likely trying to abort when directional control deteriorates.

Aren't you taking a chance taking off with a bad airplane? Sure you are. You take a chance every time you release the brakes. In this case, however, you're probably better off to go fly, analyze the situation and then take the proper action.

TAC TALLY



	TAC			ANG			AFR		
	JUL	THRU JUL		JUL	THRU JUL		JUL	THRU JUL	
		1985	1984		1985	1984		1985	1984
CLASS A MISHAPS	1	11	14	2	9	3	0	0	0
AIRCREW FATALITIES	1	7	11	2	6	2	0	0	0
TOTAL EJECTIONS	1	9	11	1	6	2	0	0	0
SUCCESSFUL EJECTIONS	0	7	9	1	6	2	0	0	0

TAC'S TOP 5 thru JUL 85

TAC FTR/RECCE			
class A mishap-free months			
36	405 TTW	(F-15,F-5)	Luke AFB, AZ
30	1 TFW	(F-15)	Langley AFB, VA
29	33 TFW	(F-15)	Eglin AFB, FL
27	366 TFW	(EF/F-111)	Mtn. Home AFB, ID
26	49 TFW	(F-15)	Holloman AFB, NM

TAC AIR DEFENSE			
class A mishap-free months			
150	57 FIS	(F-4)	Keflavik, Iceland
103	5 FIS	(F-15)	Minot AFB, ND
100	48 FIS	(F-15)	Langley AFB, VA
59	318 FIS	(F-15)	McChord AFB, WA
50	87 FIS	(F-106)	KI Sawyer AFB, MI

TAC-GAINED FTR/RECCE			
class A mishap-free months			
151	138 TFG	ANG(A-7)	Tulsa, OK
150	917 TFG	AFR(A-10)	Barksdale AFB, LA
128	114 TFG	ANG(A-7)	Sioux Falls, SD
117	183 TFG	ANG(F-4)	Springfield, IL
114	180 TFG	ANG(A-7)	Toledo, OH

TAC-GAINED AIR DEFENSE			
class A mishap-free months			
133	177 FIG	ANG(F-106)	Atlantic City, NJ
99	125 FIG	ANG(F-106)	Jacksonville, FL
82	119 FIG	ANG(F-4)	Fargo, ND
66	107 FIG	ANG(F-4)	Niagara Falls, NY
57	147 FIG	ANG(F-4)	Ellington AFB, TX

TAC-GAINED Other Units			
class A mishap-free months			
192	182 TASG	ANG(OA-37)	Peoria, IL
176	110 TASG	ANG(OA-37)	Battle Creek, MI
172	USAFTAWC	(many fighters)	Eglin AFB, FL
164	84 FITS	(T-33)	Castle AFB, CA
106	552 AWACW	(E-3, EC-130)	Tinker AFB, OK

CLASS A MISHAP COMPARISON RATE

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

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	1985	3.2	3.4	2.7	2.4	2.9	2.7	2.5					
	1984	3.4	4.3	3.3	2.5	2.9	3.8	3.3					
ANG	1985	4.8	4.8	3.0	4.5	4.2	4.9	5.4					
	1984	0.0	2.3	1.5	2.2	2.6	2.1	1.8					
AFR	1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0					
	1984	0.0	0.0	0.0	0.0	0.0	0.0	0.0					

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FLEAGLE

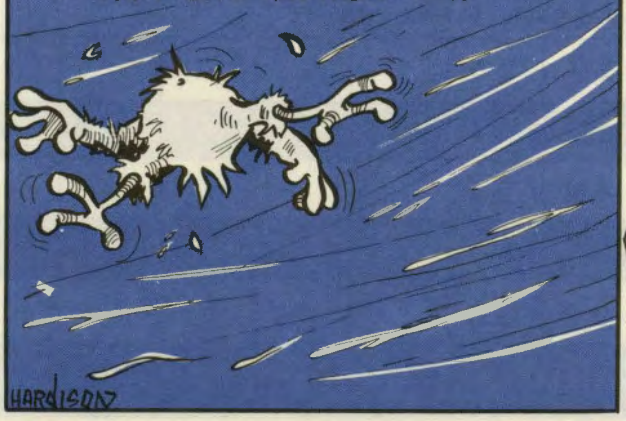
IT CAN START AS A WIND, A BREEZE OR GALE,
AND BUILD TO A THING OF MIGHT.
THIS WHIRLING MASS STARTS OUT IN THE SEA,
AND CAN STRIKE BOTH DAY OR NIGHT.

WE SHOULD FEAR THIS DEADLY FORCE,
AND DREAD ITS WIND AND RAIN.
SOME HAVE FACED ITS MIGHTY POWER,
AND FELT ITS AWSOME PAIN.

WHEN ON THE HORIZON, A FLYER APPEARS,
HE'S COME TO SAVE THE LAND.
HE KNOWS NO FEAR, THIS ACE OF JOCKS,
HE'LL STOP THIS THING FIRSTHAND.

STRAIGHT FOR THE EYE, WENT OUR FEATHERED KNIGHT,
FIGHTING WITH CLAW AND BEAK.
A THING OF CLOUDS, WIND AND RAIN,
CAN'T BE ANYTHING BUT WEAK.

BUT SOON OUR FIGHTER, WINDBLOWN AND WET,
IS BOUNCED AROUND THE SKY.
SAPPED OF STRENGTH AND TIRED OF LIMB,
HE CAN'T GIVE ANOTHER TRY.



HARRISON

ONCE AGAIN THE MIGHTY STORM WINS,
A STORM WE CHOOSE TO NAME.
BE IT ANNA, BILL, CAMILLE OR DON,
IT'S STILL THE DREADED HURRICANE.