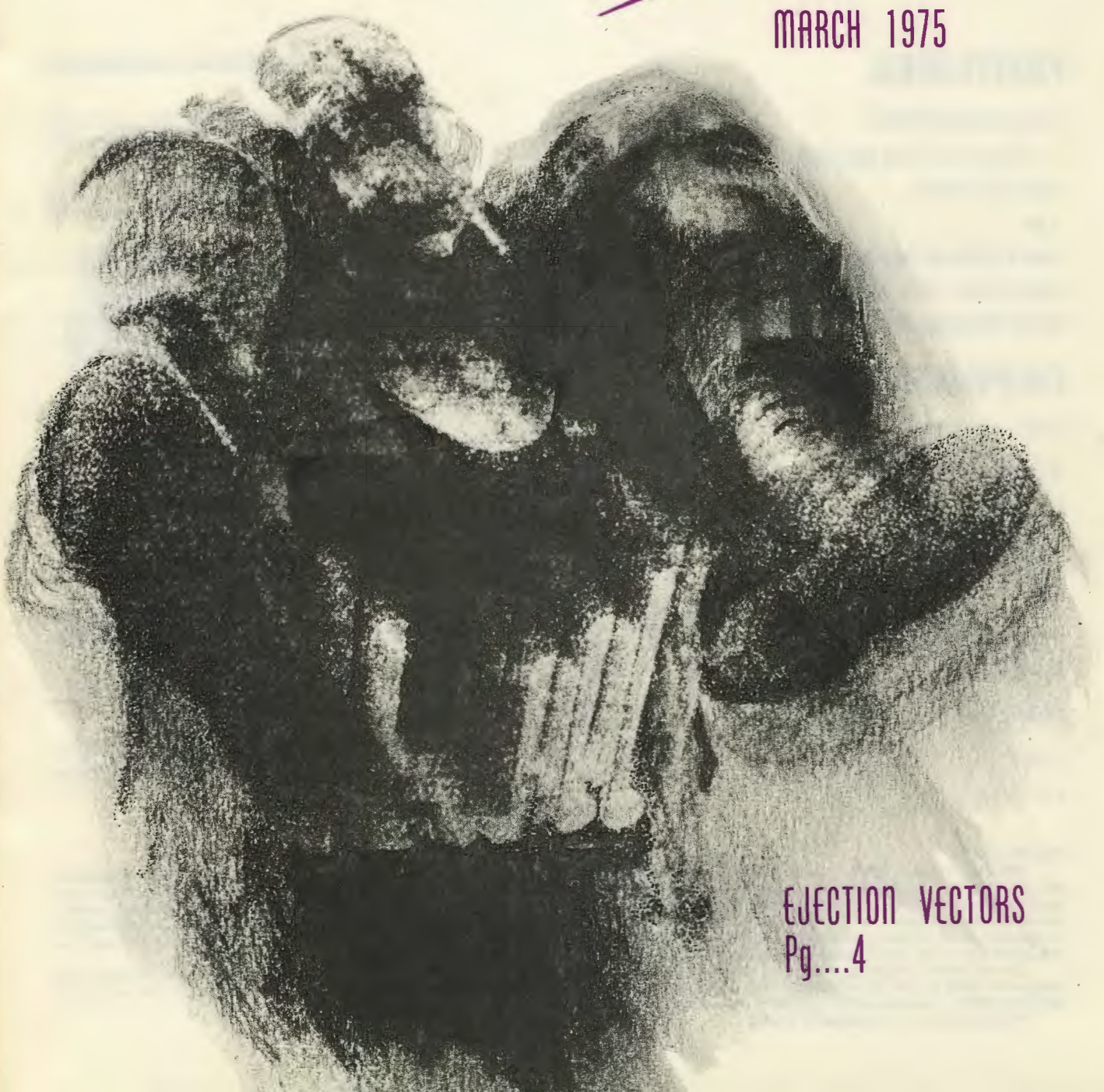


# TAC ATTACK

MARCH 1975



EJECTION VECTORS  
Pg....4

# MAR

FOR EFFICIENT TACTICAL AIR POWER



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### TACRP 127-1

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## Angle of ATTACK

### PEOPLE ARE THE KEY

When a person does nothing more than think of the safety implication of the task he is performing, the first step in a safe operation has been taken. A major objective of any accident prevention program is to instill in our personnel an awareness that not only makes them think, but prompts them to act safely as well. This is accomplished through the collective efforts of commanders, functional managers, supervisors, and the "doers." Awareness of the hazards, adequacy of training, and good procedures are necessary to assure an efficient operation. Ascertaining that procedures are followed by the "doers" will assure that desired standards are achieved.

— Commanders — Unit achievements do not exceed the level of the commander's interest. Command leadership in accident prevention is absolutely essential to obtain positive results. Actions and reactions to events and circumstances are significant in developing attitudes among subordinates. Desired attitudes result when subordinates realize that safety factors are considered important by a commander. Undesirable attitudes result when commanders accept procedure violations or token compliance. Additionally, commanders must be aware of work area conditions, talk with subordinates, and listen to their complaints and suggestions. A commander's awareness is one key to safe operations.

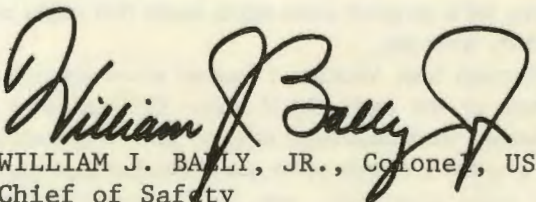
— Functional managers — These key supervisors have a vital role to carry out the commander's safety program. They have the same moral obligations as the commander and are in a position to get closer to the problem by getting out into the worker's environment. They talk their language and are the key to good procedures that govern our operations.

— Supervisors — Supervisors at all levels must insure that their personnel are fully qualified for tasks assigned, and that facilities and equipment are adequate and properly maintained. This means that safety standards

must be strictly enforced — that hazards are promptly identified, reported, and eliminated. The supervisor, by virtue of his position, has overall responsibility for accident prevention within his activity. He is in the best position to evaluate each of his subordinates' potential for causing an accident. His most important skill is the ability to communicate with subordinates — to interpret the procedural jargon. The supervisor is the hub — the buffer; he must be tuned in, alert and professional. He is one more key to doing the job safely.

— The "Doer" — This is the area where commanders and supervisors must focus their attention. A two-way flow of communication must exist at this level if any safety program is to survive. All too often this is a one-way street and someone doesn't get the word. The result is often an unnecessary injury to our "doers" or damage to our equipment. The Air Force spends millions of dollars yearly to train our highly technical force. We must insist that these valuable talents are used in a safe and efficient manner. "Doers" must understand that shortcuts and deviations from procedures or tech data are not the best way or the safest. They must also understand the importance of identifying a mistake or correcting a known deficiency which could result in injury or death to a co-worker or aircrew. In other words, they must have the confidence to communicate freely with their supervisors about their jobs and the procedures they are to follow.

People are the key to a safe operation, and only through one-on-one contact between commanders, functional managers, supervisors and the "doer" can we eliminate costly and tragic accidents.

  
WILLIAM J. BALLY, JR., Colonel, USAF  
Chief of Safety

# EJECTION VECTORS

By Lt. Col. Howard Kidwell  
TAC/DOXBL

Most RF/F-4 and OV-10 crews who have been to SEA over the past bunch of years have run into Mr. Michael Grost, Field Service Representative for Martin-Baker Aircraft Co. Mike is one extremely dedicated "bloke" who undoubtedly has saved numerous aircrews through his briefings on the Martin-Baker seat and recommendations following detailed and thorough accident reports. I am grateful for his permission to use portions of his July 1974 Field Service Report. The following paragraph is quoted:

"With wall to wall 82s, a flight of two F-4Ds departed for a night ride over Uncle Ho's Interstate. Shortly after liftoff, a fire was observed by the tower from the left engine AB area. Calls from tower, mobile, and #2, plus the steady fire warning light, give impetus to the AC to shut the left engine down. Max gross weight and right engine in AB, the crew tried desperately to keep the old girl in the air; however, a little too much pull on the pole and the bird departed. Everyone hollered, 'Get out!' and just before impact, the crew ejected. The GIB made it but the AC didn't. Just not enough time for things to work."

Fiction? No, it happened. Why hadn't the AC gotten out earlier? Perhaps if he'd had more knowledge of ejection vectors, he would have known that any delay would cost him his life and he would not have delayed until it was too late. We'll look at ejection vectors and maybe we'll generate some alpha waves that might come in handy some day.

Ejection Seat Vectors: I learned about ejection seat vectors in the early F-104 days. Our squadron was converting from downward ejection seats to upward seats and you had a chance to fly one or another depending on your flight commander, who just "happened" to know



ejection vectors

which birds were converted and kept this constantly changing list tucked safely under his mother's picture. Being Green Four, you can guess who had the "down" seat!

Much has been written and said about ejection seats having "X" FPS (feet per second) acceleration. The acceleration that can be used is limited by human tolerance levels, seat instability, ejection forces, etc. However, for simplicity's sake, let's just talk about total time for seat operation or time required. In the case of the F-4, it's about 3.5 seconds, and this is considered minimum time, i.e., no malfunctions, everything works as advertised. Now we have established a guideline: time. Either the system has enough time to operate or insufficient time remains for the system to complete its full function and — ground impact!

In controlling our ejection seat vector, three things apply: airspeed, attitude, and altitude. We'll examine them one by one and see how they help/hurt us.

**Airspeed:** In combination with ballistic and mechanical devices, airspeed is important in opening the 'chute as quickly as possible. However, remember at high speeds the seat will travel a greater distance and this "down range" distance can be a problem in low altitude, unusual attitude ejections. At slower speeds, airstream loads will be lowered and parachute opening times will increase; this will increase your total system operating time (time required). In a nutshell, airspeed (high or low) is energy. Use it to get your vector going up, but once airspeed decreases to the aircraft's stall point, sink will result and when related to time required/time available, low altitude escape could be lethal.

**Attitude:** Pure and simple, if we reduce our pitch attitude from level flight, or change from "0" degrees angle of bank, we reduce upward seat vector and thereby subtract from time available. For example: At 30° of bank, 30% of the seat's upward vector is lost, and for 60°, the loss would be 50%. At 90°, there is a total loss of all upward seat vector (Figure 1).

**Altitude:** How many accident reports do you read that say, "Insufficient altitude was available to complete the ejection sequence." It's easy to be lulled into false security and think that a few hundred feet is fine and forget that angle of bank, sink rate, etc., can negate the whole thing. Altitudes in the flight manuals are not just guessed at; they are derived from sled tests, computer studies and (unfortunately) information obtained from previous fatal ejection statistics. Take heed and know your real minimums!

**Flight Path and Ejection Vector:** Now that we have talked about the three basic measurements of flight, it's easy to see that the flight path is missing. A bird descending or climbing will obviously affect the ejection

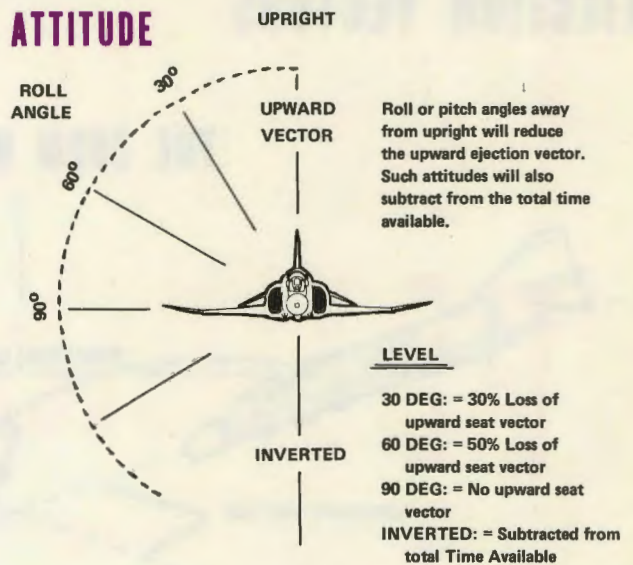


FIGURE 1

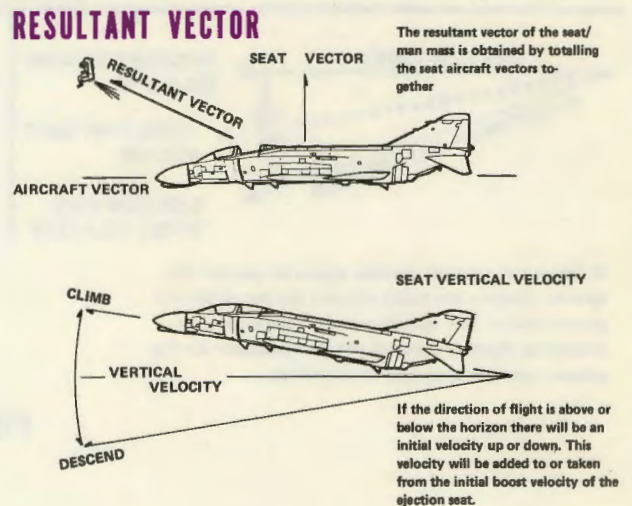
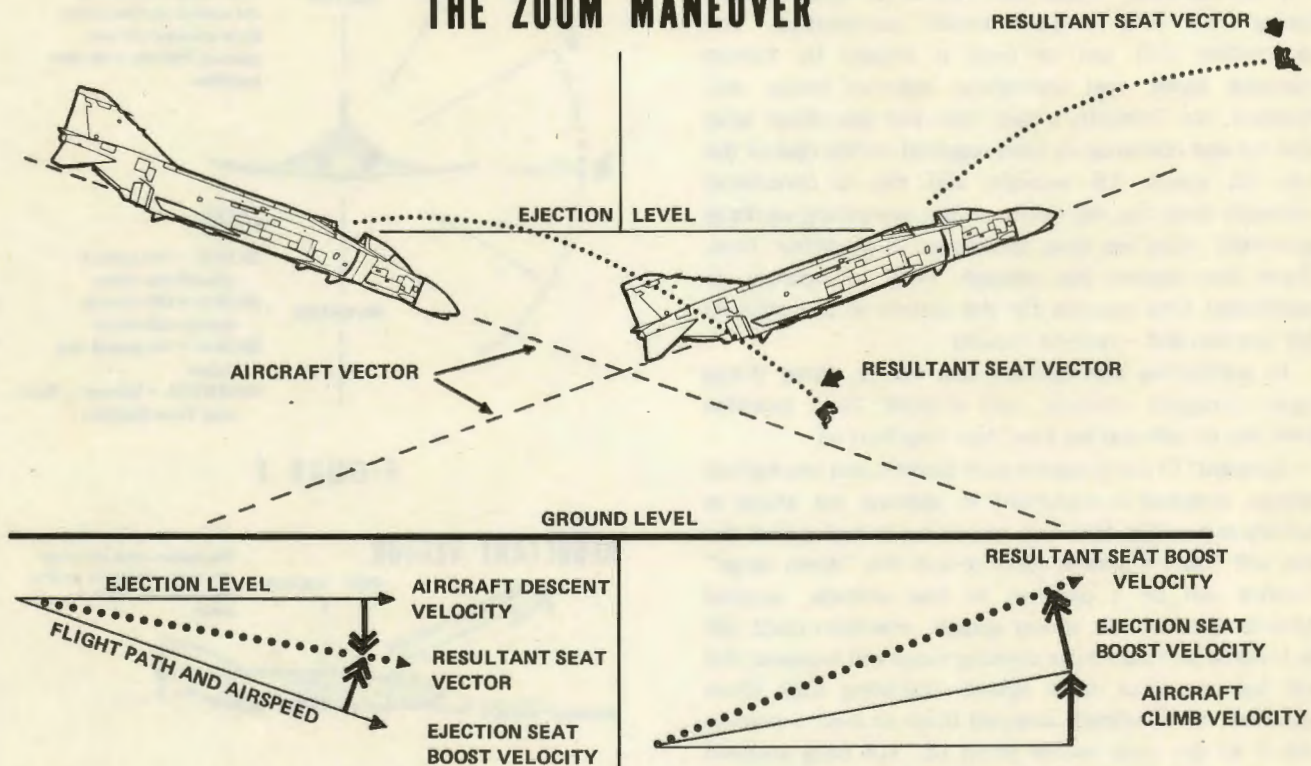


FIGURE 2

seat trajectory. By raising the aircraft flight path away from the ground, we are in effect increasing our time available to give us a time safety margin. Changing our flight path from descending to ascending is the Zoom Maneuver, Zoom and Boom! The Zoom Maneuver permits you to trade airspeed for advantageous upward ejection vector. This increases time available! If done correctly, you gain tremendous advantage by changing the vector (Figure 3). Over-rotating while putting the nose up can blow you out horizontally, thus negating the seat's upward vector. If we're going up at high airspeeds, the seat would still climb favorably; however, at low airspeeds, the additional thrust advantage provided by seat boost

# EJECTION VECTORS

## THE ZOOM MANEUVER



If the aircraft descent velocity equals or exceeds the upward ejection seat boost velocity the net effect is a cancellation of seat upward vector. This results in a downwind ejection reducing the time available for the escape system to complete its operation.

When the zoom maneuver is used, initial aircraft climb velocity is then added to the ejection seat boost velocity thereby increasing the total seat trajectory height — which increases time available for the escape system to fully operate in.

FIGURE 3

would be lost. At slow airspeed, if an attempt is made to gain maximum altitude, a stall would most probably result. This puts you into a high sink rate which, at low altitude, generally results in a bash. Just getting the nose up in this condition gives us the up-vector that we're looking for. Low and fast is another story. Unless the bird is coming apart around your ears, zooming will gain that much needed altitude and reduce ejection forces.

In the movie, "Ejection Vectors," a graphic illustration of how ejection vectors work was illustrated (Figure 2). The GIB ejected at 70 feet in a climbing 55° nose-up attitude. The combined upward vector gave him an

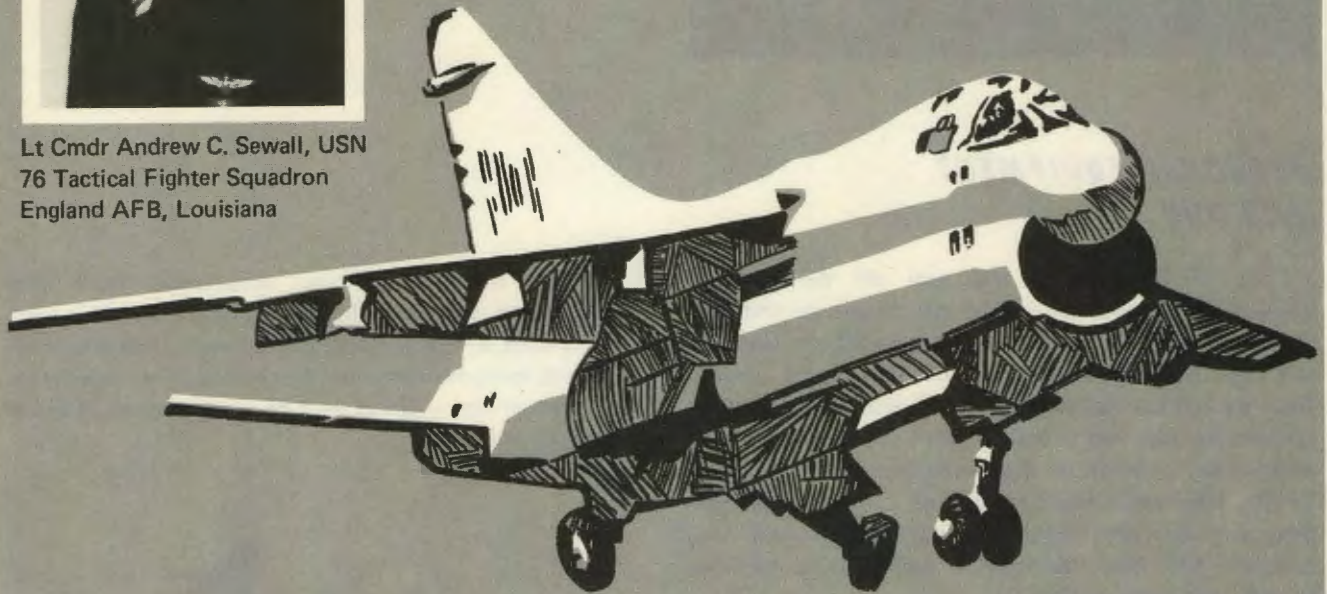
additional 200 feet of trajectory for full 'chute deployment. Due to the 85° nose-up attitude, the front seater gained only 25 feet, even though he punched out at 250 feet; a prime example of what happens to the vector of the seat when the nose gets too high.

There you have it. A quick review of vectors and what they do for and against you. If you have read this with a "I knew that" attitude, hats off! You have a good knowledge of vectors. If we have stirred up some thought, then these scribbles from a frustrated fighter pilot have been well spent. Know your system and have a plan. It's your A—!

## TACTICAL AIR COMMAND AIRCREWMAN of DISTINCTION



Lt Cmdr Andrew C. Sewall, USN  
76 Tactical Fighter Squadron  
England AFB, Louisiana



Lieutenant Commander Sewall, a USN Exchange Officer flying A-7Ds with the 76 Tactical Fighter Squadron, was leading a 4-ship DCM mission. While maneuvering with his wingman for an attack on the other 2-ship element, Lt Comdr Sewall experienced two uncommanded excursions in the roll axis, followed by extremely heavy airframe vibration. After rolling wings-level and establishing a slight climb to decrease airspeed, Lt Comdr Sewall advised the remainder of the flight of his difficulty. The intense buffeting continued, making radio transmissions difficult and exposing him to acceleration forces in excess of 3 negative and 6 positive Gs. Lt Comdr Sewall's wingman observed the wingtips traversing an arc of nearly three feet, the left aileron fluttering violently and the hook falling from its retracted position. About one minute after this airframe flutter began, pressure was lost in the #1 Power Control System followed shortly by a failure of the #3 Power Control System. The Ram Air Turbine was extended but failed to restore pressure in the #3 system. Lt Comdr Sewall executed the appropriate bold face emergency procedures which included slowing to less than 200 KIAS. Despite this slower airspeed, the fluttering and oscillations continued for 5 more minutes. At that time and for no apparent reason, the oscillations ceased. Meanwhile Lt

Comdr Sewall had turned toward England AFB and declared an emergency. En route, the gear and flaps were extended using the emergency extension procedures, and a slow speed controllability check was performed. It was found that aircraft control was adequate down to 160 KIAS, so Lt Comdr Sewall planned the approach for 170 KIAS. Even at 170 KIAS, the aircraft handled sloppily and required considerable trim and control inputs to maintain controlled flight. A landing speed of 170 KIAS also meant that the aircraft would impact the runway nosewheel first. Lt Comdr Sewall successfully negotiated this difficult landing and accomplished an approach end barrier engagement. An investigation revealed that the actuator rod end had separated from the aileron, punching a 3" hole in the wing. The destructive flutter of the left aileron induced the violent oscillations and the flailing actuator caused the failure of the #1 and #3 hydraulic systems. Numerous loose and missing Dzus fasteners along the aft belly of the aircraft confirmed the intensity of the flutter. Lt Comdr Sewall reacted coolly and decisively to an extremely unusual emergency. His professional skill and timely actions prevented the loss of a valuable aircraft and qualify him as this month's Aircrewman of Distinction.

# TAC TIPS

The only exercise some people get is jumping to conclusions.

## PERSONAL EQUIPMENT AND YOU

The RF-4C made a left turn off the runway, immediately followed by a right turn to jettison the drag chute. Just after he dumped the chute and began another left turn, he heard a loud bang and saw smoke coming from the left side of the front cockpit seat. The pilot then noticed the sear was dislodged from the cartridge firing mechanism in front of the emergency harness release handle. The handle was not locked up . . . the leg restraint lines, seat belt and harness had not been released. The cartridge had fired causing the guillotine to cut the parachute withdrawal lines.

Initially the investigation centered on the possibility that the pilot mistakenly pulled the emergency harness release handle instead of the drag chute handle. The pilot, a highly experienced bent-wing driver, disavowed this error. In fact, later efforts by the pilot, investigator, squadron life support personnel and egress shop technicians to raise the handle far enough to dislodge the sear without also activating the mechanical linkages to release the leg restraint lines, seat belt and harness were unsuccessful.

The investigation then led to another possibility — some item of the pilot's personal equipment caused the handle to be pulled. This investigation resulted in one very interesting finding:

*If the zipper on the outside of the pilot's right leg was only half closed, the zipper tab was very close to the sear. By hooking this tab on the sear, the pilot could fire the cartridge by raising his right leg (as if applying left rudder), without opening the mechanical releases. It was noted the pilot was wearing a loose-fitting G-suit which allowed the zipper tab to rest on the sear when not fully zipped.*

interest items,  
mishaps  
with morals,  
for the  
TAC aircrewman

There was no definite conclusions from this investigation, but a very interesting possibility. This pilot was refitted with a properly fitting G-suit. How does your personal equipment fit you? Remember, more than looks are involved here — get all your PE items in order. It could save your life.



## YOUR CHUTE IS SHOWING

Recently, an F-4 hung up in a dearm area when a wind gust blew the collapsed drag chute over a raised taxiway light. The chute ripped, the light broke and the drag chute housing was damaged.

The 75-foot-wide taxiway was used as a dearm area only because the aircraft had some unexpended AIMS. The pilot simply didn't have room to turn his Phantom without the possibility of snagging the light. This unit now prohibits the use of this taxiway for dearming until the solitary raised taxiway light is replaced by a flush-mounted one. Pilots: Watch out for taxiway obstructions that can snag your chute. Safety Officers and Chiefs of Airfield Management: Check for similar conditions/hazards on your next airfield inspection. If you have obstructions that could be a hazard to aircraft with drag chutes, see about having them removed; if they can't be removed, a change in taxi routes may be in order. Who needs a barrier on the taxiway?



## KC-97 Vs MD-3

Recently, a KC-97 destroyed a \$12,000 MD-3 power cart and suffered about \$15,000 damage itself. During an en route stop, the thru-flight inspection revealed a hydraulic pump drive seal leak on number two engine. Both the aircrew and maintenance decided to ops check it during normal engine start prior to departure to determine how bad the leak was, so the bird was serviced for takeoff.

The pilot set the parking brake, and the chocks were removed. The aircraft's power unit (GTPU) was found to be inop, so the ground crew requested, and got, an MD-3. Number two was started and an ops check was made on the hydraulic leak. It checked out OK, so engines 3, 4, and 1 were started and placed at idle RPM. The hydraulic pressures checklist item revealed only 900-1,000 PSI and one-half gallon in the main system, so the pilot requested servicing in an attempt to get normal pressure. The hydraulic system was unnecessarily depressurized for servicing and that's when it hit the fan — rather that's when the fans hit it. The '97 rolled forward. The inop normal brakes were applied with the expected results. Emergency brakes were tried, but the aircraft continued to roll forward and number two prop struck the MD-3. The prop knocked the cart over and threw debris into number one engine. The cart burst into flames, but the ground crew quickly extinguished it before the fire spread. The pilot shut down the engines and ordered evacuation. The only aircrew injury occurred when the boomer and three passengers used the main cabin escape rope and received superficial rope burns.

The moral? I'll quote the incident report: "Suspect aircrew were unaware of the unpublicized and little-known fact that parking brake pressure is released when positioning the hydraulic system depressurization and emergency charging valve to the depressurized position. Premature removal of wheel chocks allowed aircraft to move forward." At this time, it's not known why the emergency brakes failed, but they shouldn't have been needed at all. Take time to learn the system so you can do it right — the first time.

## TANKS A LOT

An F-100 jock was recently credited with the "kill" of one illegal whiskey still near a Southern civilian airfield. The incident message started out as a dropped object report . . .

During a 360 degree overhead pattern after a ground attack sortie, the pilot began to lower his landing gear.

## TAC ATTACK

When he slapped the landing gear lever to the down position, his extended fingers entered the guarded area of the emergency jettison button and the jettison release circuits were actuated. The left and right auxiliary fuel tanks and left B-37 container were released. (The right B-37 container did not separate due to a ruptured gas tube and loss of gas pressure.)

Due to the close proximity of other cockpit switches, proper technique for lowering the landing gear handle in all aircraft is a necessity for all jocks. When lowering the gear handle, grasp the lever with a cupped hand, rather than slapping the lever down. This will help to eliminate the possibility of inadvertently activating other switches.

The concluding paragraph of the incident report stated, "As a result of the presence of news media and local law enforcement personnel at the scene of drop tank impact, a resident hog farmer was apprehended for illegal operation of a still."



## T-33 CATAPULT INITIATOR QUICK-DISCONNECT

During taxi for takeoff, the IP in the back seat of the T-33 noticed that the front seater's catapult initiator quick disconnect was unfastened. The pilots later discussed this incident with the unit's safety officer and life support people. They determined that the left parachute riser inadvertently unlocked the quick disconnect while 'chuting up. This was the third time this had happened in this unit. That is, this was the third time it was known to have happened.

Disregarding any design deficiencies in the system, it's simply a matter of trying to safely buckle up inside a cramped space. You can help yourself avoid the problem by asking the crew chief to assist with the chute harness during strap-in. Before he goes down the ladder, ask him to check the seat catapult initiation quick-disconnect to insure it's still connected. This is just an example of good teamwork and you can bet your "quick-dons" your chief will be glad to help you.

Courtesy of  
Major John Scott  
834 TCOMPW/DOF  
Hurlburt Fld FL

# A TRIBUTE to the MECHANIC

Courtesy

GE JET SERVICE NEWS



*This tribute to Air Force mechanics first appeared in print in April 1931. The author was Capt. Ira C. Eaker, later Lt. Gen. Ira C. Eaker. Chief of Air Staff, USAF, who retired in 1947. The maintenance man's responsibilities haven't changed from that of the airman mechanic of 43 years ago. There's nothing in this near half-century old tribute that can't and shouldn't be said for today's maintenance people.*

Every generation of every nationality requires a hero. It finds one or makes one.

In earliest times, he was mythical. A little later, he was some great warrior or explorer. But some man has always been set apart from his fellows and accorded the adulation of the multitude . . . then along came the spectacular flights. At this juncture, America was searching its collective soul for a hero, and it seized upon these unsuspecting fliers. So the toga was handed about, falling in turn upon each succeeding ocean spanner or record breaker.

Strangely enough, with all the shouting that has been done, all the medals which have been struck, the right man in this flying business has yet to be picked.

Human flight was a comparatively new art. For thousands of years, man had longed to soar among the clouds. It was not unnatural then that some member of the flying fraternity should fill the national need for a hero.

For some reason the pilot was selected. He it was

whose will directed these new machines to flight, whose courage permitted performance of such feats of daring high above the earth.

So, selected he was. And each small boy decided not to be a policeman, fireman, or railroad engineer, but envisioned himself a flier when he grew to man's estate.

So we pulled a parade, waved flags, made medals, played the band and greeted like a Viking arriving at Valhalla each new pilot who flew a little higher, or a little longer, or a little faster.

Why not? Your airman wore proudly the symbols of his profession. He was the striking figure in this new industry. Small wonder that the little lads forswore old models and changed their boyhood dreams.

But we made a great mistake, as multitudes often do. The fellows who make airplanes fly, and make records fall, and who drive 10,000 airplanes 50 million miles a year were not the pilots. They were the mechanics.

Let me tell you about this fellow as I have come to know him . . . and see if you don't agree with me.

Most men work for reward. There are various forms of reward—the cheers and commendations of onlookers, money, pleasure, self-expression, self-satisfaction. The pilots get all of these in some degree.

What does the mechanic get . . . his hands are cut and black from contact with greasy engines. He can't keep "that skin you love to touch" and main-

tain an intimacy with an airplane powerplant. Don't ask me why or what kind of a man would elect such a role, such a life. Rather, tell me why there is a hermit, wizard, nurse, nun, or saint. I don't know! There is no accounting for occupational tastes, but every time I fly I thank fate for a good mechanic.

He's no dunce, either. To learn all he knows would give many a college professor an awful headache. He gets his invaluable training over a long period of years. The school of hard knocks is his. Truly, he learns to do by doing.

This modern airplane engine is no simple mechanism. It has more parts than has the human body, and more ailments. A divine providence has fashioned your own mechanism more smoothly, coordinated your organs better than man has built this engine. But the good engine mechanic knows every part, every symptom, every malfunction as well as any doctor knows the causes of and remedies for your aches and pains.

Some years ago, I was assigned a plane for flight. I started to climb in and the mechanic said, "Lieutenant, I wouldn't take that ship up. The engine doesn't sound right to me."

I ran it up and it delivered full power. It hit on both switches, accelerating promptly, and I couldn't detect any indication of trouble. I called for the engineering officer. He ran it up and marked it OK, but the mechanic still shook his head.

I took off and joined a practice formation and soon forgot the warning of my mechanic as we flew over San Diego Bay, past Point Loma.

Twenty minutes later, the engine quit cold without warning. I set her down in the sea. Being a land plane, she soon sank.

While swimming around, waiting for a rescue boat, I made one resolve that has remained with me through the years. When a good mechanic says an engine's bad, I don't fly that plane. He's the doctor.

These mechanics are versatile, too. Mine was on that rescue boat. He has never to this day said, "I told you so," but couldn't rest until we had fished that plane off the ocean floor.

Then he displayed one of his rare "human weaknesses" by spending his Sunday holiday taking it apart to see what had failed. His expression never changed as he showed me the cause.

So, you see, the airplane mechanic is human. In fact, he has the instincts, training, and mental ability of a surgeon.

One of the characteristics that we always like to associate with heroes is courage. Here your mechanic is not found wanting. He'll fly with any pilot, any time and that's something I won't do. It takes more courage to ride than to pilot the plane yourself. You always know what you are going to do. He never does . . . I have known some pilots



to get cold feet. Yet, I have never known a mechanic to decline to fly.

The mechanic is reliable; he is trustworthy. He takes his work seriously; he knows that human life is at his mercy. He worries, too.

One of my best men, who had cared for the special planes of high officials in Washington for some years, once came to me and asked to be relieved from those duties and assigned to routine work. He said that the tremendous responsibility he carried was undermining his health.

I know another mechanic who spent his last dollar to buy a flashlight so that he could better see to make his inspections in closed hangars on dark winter days.

Examine the rolls of the airmen dead and you'll find mechanics as well as pilots. Yet, their names are forgotten. Others got the adulation, the praise, the medals, and the commendations . . . but I say, "My hat's off to you mechanics. You may be ragged grease monkeys to some, but to me you're the guardian angels of this flying business." ➤

# CHOCK TALK

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

## **F-4 OVERSERVICED STRUTS**

Two RF-4Cs departed from a transient base where, incidentally, there was extensive F-4 maintenance capability. Takeoff was normal until both of the Phantoms' pilots raised their gear handles. Both aircrews heard a "thump" and both of the aircrafts' gear handles glowed red. One of the aircraft indicated unsafe (barber pole) on both main gears and the other showed unsafe only on the left main. The two pilots came out of afterburner, kept below 250 knots, checked hydraulic pressures and circuit breakers, and recycled the gear. They both continued to get an unsafe on the mains so they put their gear down, got three in the green, inspected each other, dumped fuel, and made individual landings.

By now, you may have guessed this was not just an exercise in formation emergencies. Both main struts on one Phantom and the left main of the other had been overserviced by Transient Alert. This little boo-boo broke all three rod end assemblies on the gear upper shrink links — but worse than that, it put both aircrews in a tight spot. Sometimes one problem like this will be one small link in a chain of events that ultimately results in a disaster.

Servicing data plates on the struts of both aircraft were missing. This aggravated, but didn't cause, the incidents. The real cause was the age-old problem of failure to use tech data. Transient Alert doesn't have a patent on this problem; they just happened to be the culprits this time. Let's all work at eliminating the "next time."

## **PAT-ON-THE-BACK**

Fleagle-eyed maintenance personnel in another command saved a KC-135A from a possible catastrophe.

Upon completion of defueling operations, maintenance personnel discovered blue lint-type material on the upstream side of the fuel cart filter. This indicated it came from the aircraft which had been defueled. Although the amount of lint was small, the maintenance crew elected to notify their supervisors and have the aircraft fuel filters checked. Fuel system inspection revealed a blue rag had been clogged in the aft-body forward air refueling pump.

Although TAC doesn't have many C-135s in its inventory, fuel system contamination in any aircraft is a threat. Thorough post-maintenance inventory procedures are a necessary portion of all maintenance tasks. Are the procedures in your unit sufficient? How long has it been since they've been reviewed?

The initiative and conscientiousness of the personnel who defueled the incident aircraft prevented further accumulation of the lint material on the engine filters and the possibility of fuel starvation and flameout. For their alertness, we'd like to present them a pat on the back and two "atta-boys." Keep up the good work.

## **PHANTOM PHLANGES**

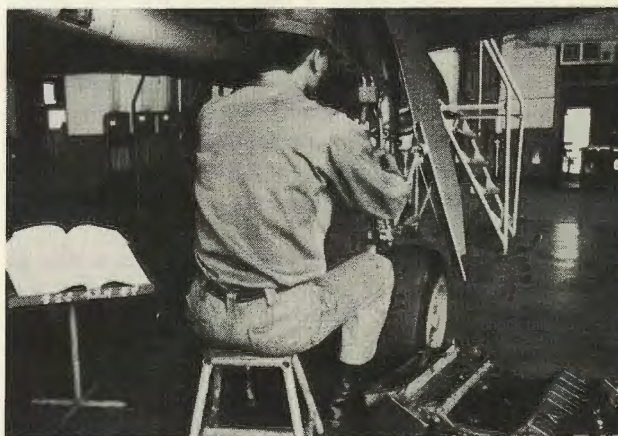
Recently, an F-4 belonging to another command received damage to an engine during start. The number one engine intake cover top mounting flange had broken off and remained in the left vari-ramp area when the cover was removed. As the Phantom started, it gulped down one flange.

The outfit inspected all covers for loose, damaged or missing flanges. Now they also check the flanges when the cover is removed. If missing, the aircraft will not be started until the missing flange is located or it is determined that it's not in the aircraft. This will be verified by NDI. The wing is also replacing the metal flanges with bungee cord retaining devices.

All great ideas. Is your unit still using intake covers with mounting flanges? What's their condition? Maybe a quick inspection would save a Phantom from indigestion.

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Here is a good rainy day project for you maintenance troops who could use a stand to hold technical orders. This stand/tool combination was made at the Field Maintenance Squadron, commanded by Lt. Col. Park Yong Tok, First Fighter Wing, Kwang Ju Air Base, Korea. To those of you who do not read Korean, the characters say: "Live up to the technical order. Hydraulic shop. Carelessness is the cause of accidents."



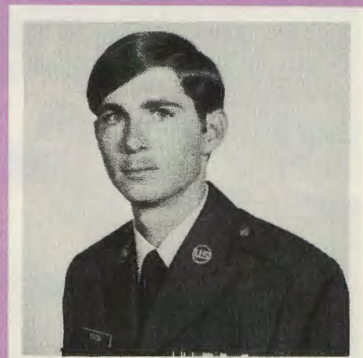
Courtesy, F-5 Technical Digest



# TAC SAFETY AWARDS

## Crew Chief Safety Award

Airman First Class Troy Staton, 4 Organizational Maintenance Squadron, 4 Tactical Fighter Wing, Seymour Johnson Air Force Base, North Carolina, has been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Airman Staton will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



A1C STATON

## Maintenance Safety Award

Technical Sergeant Frederick Hoover, 23 Avionics Maintenance Squadron, 23 Tactical Fighter Wing, England Air Force Base, Louisiana, has been selected to receive the Tactical Air Command Maintenance Safety Award for this month. Sergeant Hoover will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



TSGT HOOVER

## Ground Safety Award of the Quarter

Airman First Class Steven A. Newell, 33 Munitions Maintenance Squadron, 33 Tactical Fighter Wing, Eglin Air Force Base, Florida, has been selected to receive the Tactical Air Command Ground Safety Award for the fourth quarter 1974. Airman Newell will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



A1C NEWELL

# reborn camel



## Number 11 of a Series by William G. Holder Contributing Editor

"Curse you, Red Baron," were the words that were uttered by that small famous dog as he wheeled his trusty mount into a dive after the nasty enemy. Of course any kid between the ages of eight and eighty can tell you the famous canine of which we speak is Snoopy and his plane — a Sopwith Camel.

The popular comic strip has brought the little World War I bi-plane back into focus and caused a re-examination of its excellent airborne accomplishments "over there." It's not a well known fact that there were some 5,500 of the little craft built. The first was delivered in December of 1916 by the Sopwith Aviation Company, Ltd., Kinston-on-Thames, England.

The Western Front first saw the

Camel in July 1917. Two complete American squadrons, the 17th and the 148th Aero, were trained in Camels in England and served with the RAF in the field until November 1918; then they were transferred to the American Second Army. The Army Expeditionary Forces had a third Camel squadron, the 185th Aero Squadron, which was formed in September 1918 to serve as a night fighter unit for intercepting German night bombers in the Verdun to Bar-le-Duc sectors. A total of 1,281 enemy aircraft were destroyed by Camels during the war.

The ordnance-carrying capability of the Camel was impressive. It could carry four twenty-pound bombs (that's right, 20 pound). Two forward-firing fixed Vickers machine guns were synchronized to fire through the prop. The Camel could get up to a maximum speed of 115 miles per hour and had a service

ceiling of about 19,000 feet. It carried enough fuel to stay aloft for about two and one-half hours.

But the Camel required a cool and competent operator behind the stick. It was a temperamental little bird and in the hands of a rookie unfamiliar with its character, it could be fatal. The Camel had most of its weight, i.e., the engine and the pilot, far forward in the fuselage, which enabled it to negotiate extremely tight turns. But one of the strange characteristics of the aircraft was that the nose rose in a left-hand turn and dropped in the opposite, caused by the engine torque. The pilot needed to be super-competent on the rudder to take care of these problems. The Camel also had a tendency to spin out quickly without warning (sounds like some modern aircraft).

The "war to end all wars" has been over for almost 60 years and few examples remain of that fine little

fighting machine. It seemed fitting that the Air Force Museum should have one of the Camels to properly tell the story of the history of aviation. So in 1965, undoubtedly spurred by the Snoopy inspired interest, the director of the Museum told his restoration crew that he wanted them to build a Camel from scratch. This talented crew has accomplished many miracles from piles of metal that were once airplanes, but this order presented an ultimate challenge.

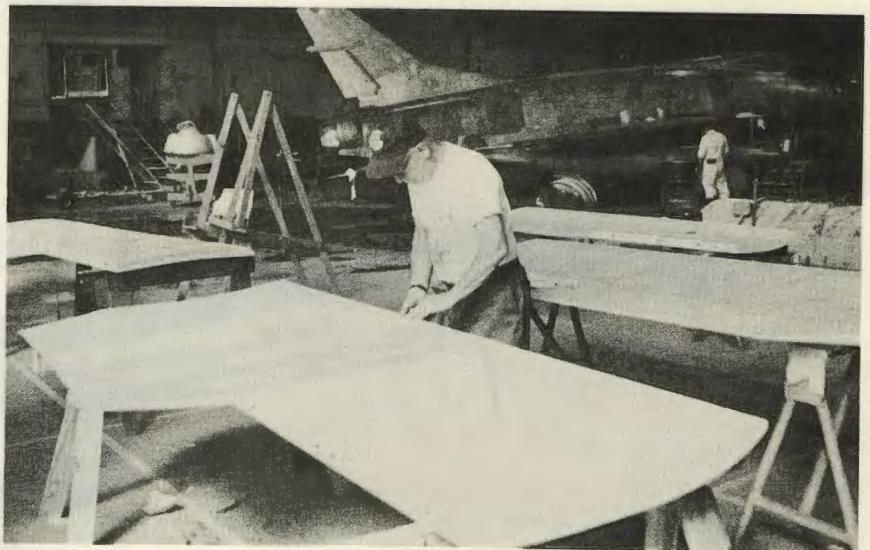
Now, just how does one start? Well, the crew had a few important parts, including a Camel engine which had been given to the Museum by the old McCook Field Research Center sometime in the 1930s. Mr. Ray Watkins of nearby Bellefontaine, Ohio saved many hours of work by donating a set of original Sopwith wheels and tires. The machine guns were also donated by dedicated historians, Joel Catron of Dayton and Dr. William Fippin of South Charleston, Ohio. The gunsight came from the Sopwith Camel used by World War I ace, George Vaughn.

The aircraft was built from original plans which were dated 1917-1918 and still carried Secret and Confidential markings. From the beginning, they planned to build their Camel as close to the original as possible — this included using wood closely duplicating the original. The wings were constructed and covered with fabric. One of the toughest fabrication jobs facing the crew was the engine cowling. Over thirty working days were required for this phase of the restoration.

Surprisingly, one of the items that was not made in-house was the propeller. It was purchased from the Ole Fahlin Company in California which still had original drawings for the Camel prop. The project stretched over nine years because it never had high priority and was worked on only when there was a slack period.

Finally, in December of 1974, it was done — and what a sight to see!

Photos by Robert Shenberger



The photos by Robert Shenberger reflect the outstanding job done by the Museum's restoration crew.

In order to celebrate the accomplishment, the Air Force Museum had a ceremony in front of the Museum. Fittingly, Camel ace George Vaughn was on hand to witness the unveiling. Although the Museum is confident their Camel is capable of flying, there

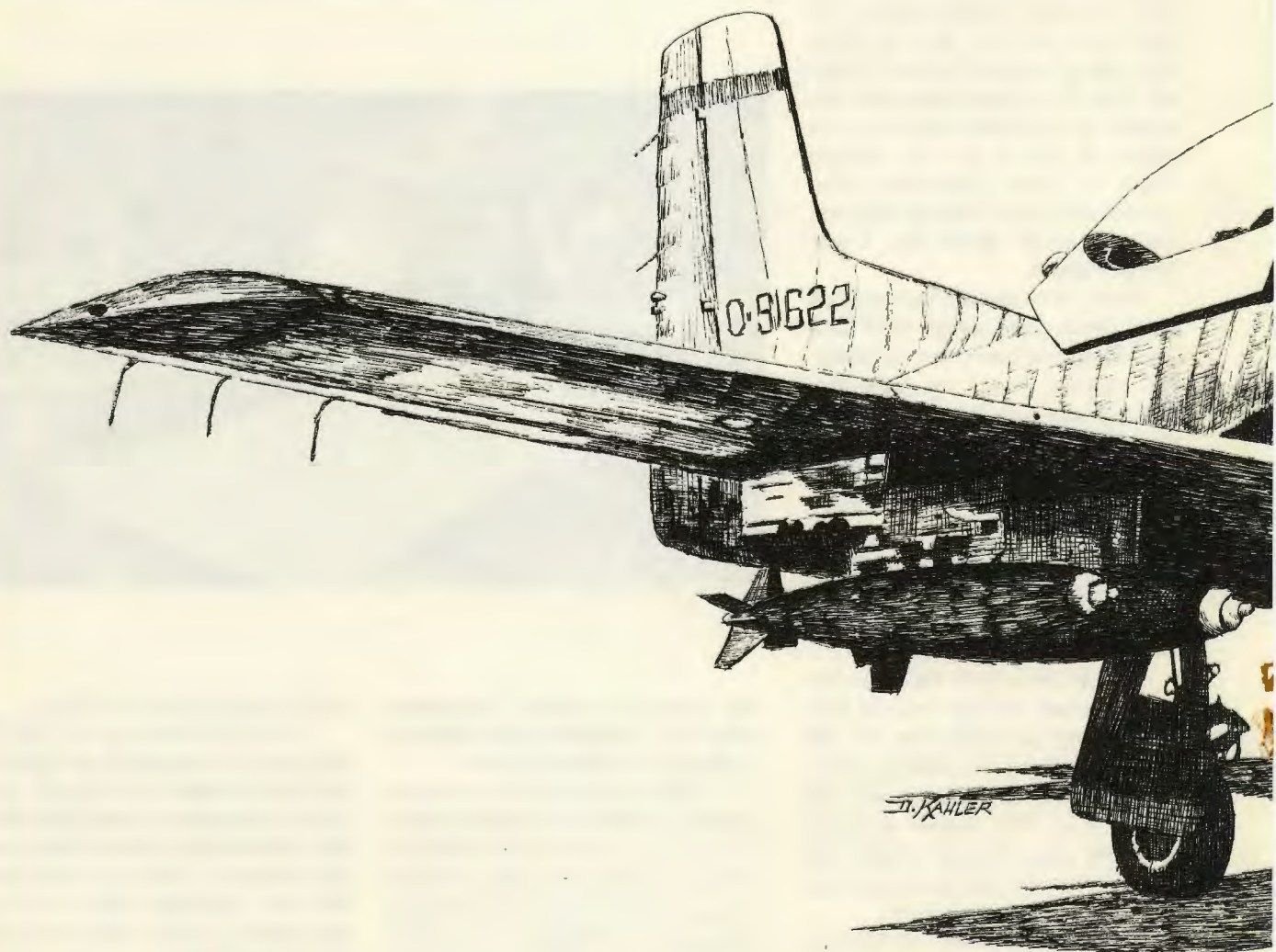
are no plans to attempt a flight.

To cap the ceremony, the Camel's tiny engine was brought to life, probably for the last time. And just for a minute, the group on hand was taken back many years to those cloudy skies over Europe — back to a time when the term "dog-fight" had a far different meaning than it does today. Go get 'em Snoopy!!! ➤



# T-28

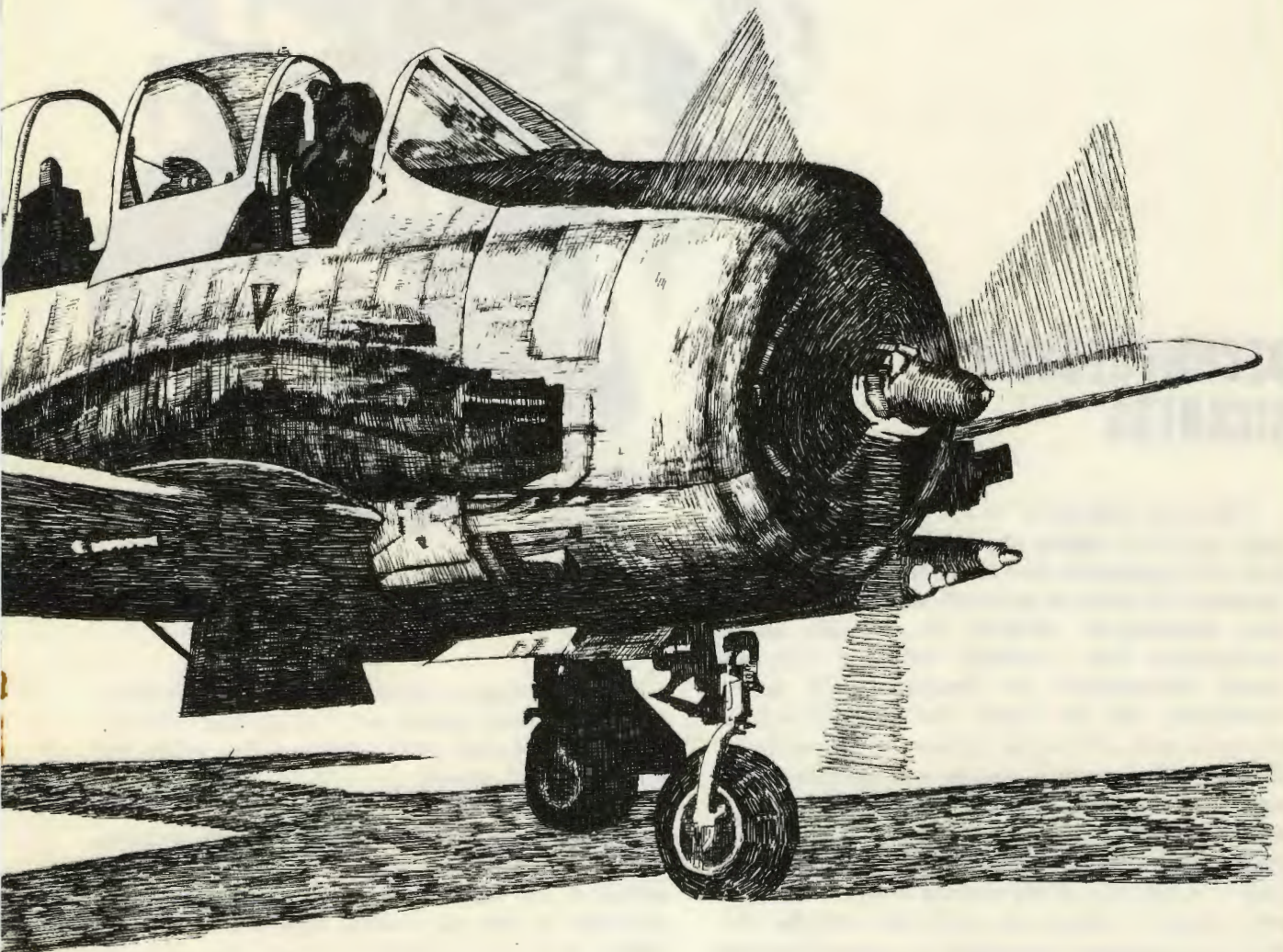
Capt Mike Byers  
Hq TAC/DOXBL





**E**x-Navy trainers, painted grey — with guns and bombs. The combat history of the '28 was overshadowed in the rush of war and now is little remembered except by those who flew them . . . and the enemy that faced them. More than ten years have passed since they first flew. Before the ramps of Southeast Asian airfields echoed with the howl of northbound jets, the '28s were there. With weapons and traditions of

an older day, they built the tactics for a different sort of war. The men who flew with .50 calibers against the ZPU's — Laotian pilots lifted from their cockpits, exhausted from the fifteenth combat mission of the day — the Raven FACs — they reaffirmed an ancient truth as old as war: esprit de corps is everything; it's men who fight, and not machines. Remember this . . . remember them!



# DTIV7 DT17 DUV7-RT17 PHYZ-BIZ

LtCol Harold Andersen  
Hq TAC Physiological Training  
Coordinator



## DECOMPRESSION SICKNESS

This is the "lead article" in a series of several in which some prominent aspects of "Decompression Sickness" (D.S.) will be addressed. As a disease which afflicts aircrew members, D.S. seems to command less respect than some other physiological reactions, e.g., hypoxia, spatial disorientation. This is probably because hypoxia and spatial disorientation are predictable and readily reproducible. We can predict the onset of hypoxic symptoms with unprotected exposure to high altitudes; likewise, a disorientation reaction will invariably occur with certain easily produced stimulations of the semi-circular canals of the inner ear. But D.S. is highly unpredictable. Past experience indicates that the main cause is a reduction of the pressure on the body: either water pressure is reduced too rapidly (as in the case of a diver) or air pressure is diminished to a value of less than one-half an atmosphere (aircrews). But we all know that

D.S. does not occur everytime we go above 18,000 feet in our unpressurized aircraft (or in an altitude chamber). There must be some other factors working, besides the exposure to high altitude.

Take, for example, a senior altitude chamber technician. He experiences probably 60 or more exposures to high altitude every year during training flights. Over a period of 15 years, this amounts to some 900-plus exposures. In one case, a senior NCO with no previous history of D. S. is suddenly stricken while ascending through 30,000 feet in the altitude chamber. His

symptoms indicate involvement of the respiratory system (chokes) and the central nervous system (CNS). He survived only because of prompt treatment in a compression chamber. Why did he react so violently on this occasion? What was different in this last flight, from the previous 900? The chamber flight profile, rate of ascent, ambient temperature, denitrogenization procedures, etc., were exactly as prescribed by regs and T O s. Something had changed to increase his susceptibility, but what? Unfortunately, that is an unanswerable question at this time.

Earlier, we said that D.S. was unpredictable, and it is, under normal operating conditions. In the case cited above, there was no way to predict that the chamber tech would be stricken, but if we make the exposure severe enough, D. S. will become predictable. How? By ascending to a high altitude with a fast rate of ascent, and exercising during a prolonged exposure. If we make the conditions bad enough, we can make D. S. as predictable as hypoxia!

Since the disease was first recognized in French coal miners (1841), several theories as to its cause have evolved. While there may be some disagreement on which is more important, all researchers in this field recognize the importance of bubbles as part of the causative mechanism.

The "bubble theory" is predominant; some researchers believe that bubbles are the basic underlying cause of all the decompression sickness, and probably cause the changes which some others have postulated as causes. It has occurred to some that if bubble formation could be prevented, there would be no decompression sickness. However, bubbles form in the body fluids and tissues in response to Henry's Law of Physics. This means that bubbles invariably will form when the pressure on the body is reduced to a certain critical level, which has been found to be about one-half an atmosphere (18,000 feet). Therefore, bubbles of varying size will be present whenever the proper conditions of reduced barometric pressure are met.

Since our bodies are exposed to a normal pressure environment of 1 atmosphere (760 mm mercury), we are in dynamic equilibrium with the gases that we call air; mainly oxygen and nitrogen. Our body fluids and tissues are saturated with them, and as long as we stay in our normal pressure environment — no sweat! But, loss of cabin pressurization at, say, an altitude of 25 or 30,000 feet, will be a whole new ball game. We must expect immediate bubble formation. At first the bubbles formed will be small, but they tend to grow slowly by a couple of important mechanisms: diffusion — oxygen and nitrogen diffuse directly from the tissue fluids into the bubble cavity because of differences in the concentration of these gases in the two areas; and by coalescence, the

uniting or merging of several small bubbles to form a large bubble.

As long as the bubbles remain small enough so that they don't block blood vessels or exert mechanical pressure on tissue structures, we don't even know they are there. These are sometimes called "silent" bubbles. They're in the blood and tissue fluids, but since they don't disrupt normal function or cause pain, they're not a problem. This helps us to understand why we can sometimes be exposed to high altitudes and never experience even a twinge — the bubbles are there, they're just not present in sufficient quantity or size or not properly positioned to cause trouble. It's a good idea to remember, though, that the longer you stay in the "bends area" (altitudes of 18,000 ft and above), the more likely it will be that bubbles will grow to a critical size.



Some people like to use the old "coke" simile, and I think it is an appropriate comparison. For those of you who are curious (and have nothing better to do) — open a bottle of carbonated water, pour it into a tall, clear glass container, and watch as bubbles form on the walls. They start as barely visible specks, increase in size until they achieve sufficient buoyancy to break away, and rise to the surface. It is a process similar to what you can experience internally during high altitude exposures.

When these bubbles are sufficiently large and numerous enough to cause problems in various areas of the body, we call them by different names: bends — pain in the joints and/or skeletal muscles; chokes — coughing, chest pain, difficulty in breathing; CNS disturbances — disruption of nerve function commonly characterized by paralysis, loss of vision, skin reactions; paresthesia — localized skin symptoms (e.g. itching) etc. In subsequent issues we'll take a closer look at each of these, with illustrative cases and present some current thinking on prevention and treatment.

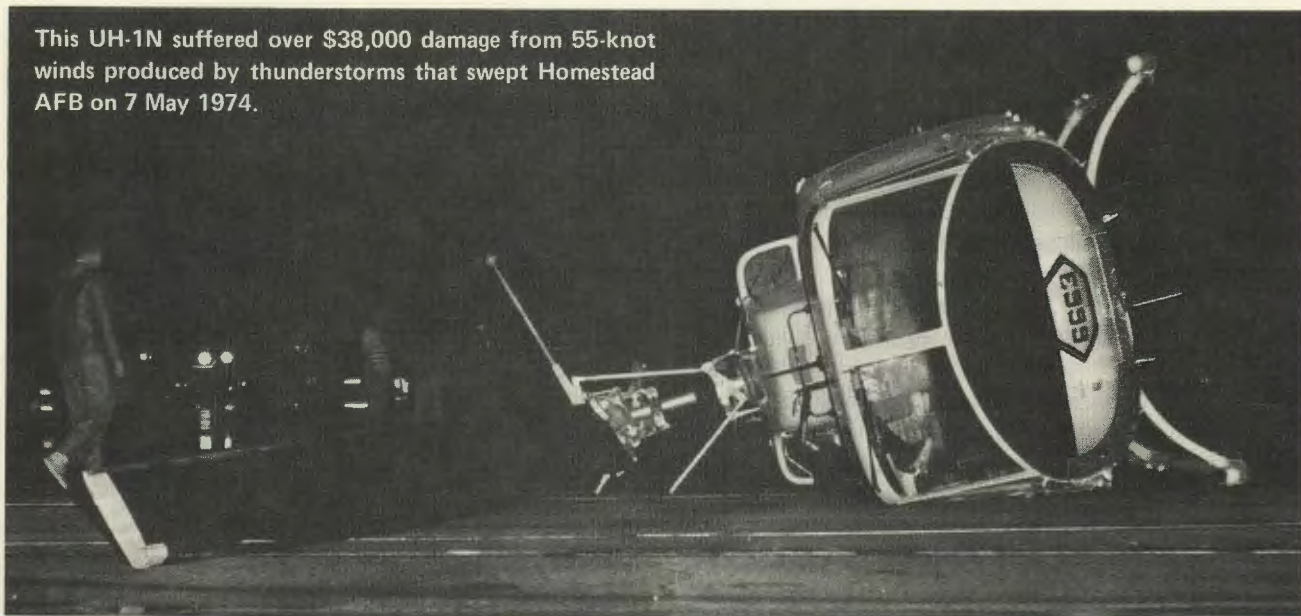
# your severe weather plan

by SMS Savoie  
HQ TAC/SEG

If, like most people, you look at the pictures before you read the article, you've probably already guessed what did these aircraft in. Every year impressive and unstoppable storms sweep across the US, leaving death and destruction in their wake. Thunderstorms, tornadoes and hurricanes aren't fussy — they'll wipe out anything in their paths. It's ironic, but the storm's easiest targets are aircraft — the machines that have conquered the atmosphere that produces these monsters.

Last year, TAC sustained over \$33,000 in aircraft damage resulting from storms — and these losses reflect only damage to parked aircraft. The photos show some of the more dramatic results of the destructive force of storms that TAC has experienced in the last few years. Aircraft are flipped upside down and AGE equipment and fire extinguishers are blown into them. When the storm

This UH-1N suffered over \$38,000 damage from 55-knot winds produced by thunderstorms that swept Homestead AFB on 7 May 1974.



On 27 September 1974, a violent windstorm swept Cannon AFB. Prompt action by flightline personnel followed a timely warning by the weather forecaster, but two F-111Ds still sustained damage as this photo clearly indicates.

hits, it's too late to do anything. The time to take action is now – March 1975.

Review your severe weather plan. Insure your unit's plan is workable and effective. Keep it as simple as possible so that everyone knows exactly what to do when the warning is sounded. If you've got a good severe weather plan, make sure everyone that needs it has a copy and that supervisors review the plan with their workers.

Have your equipment ready. Check your mooring equipment for availability and serviceability. Remove any unneeded equipment and replace defective gear. Make sure it's properly marked and insure that you and your

people know how to use it.

Keep an eye on the sky. To secure aircraft and remove potential flying debris, you'll need as much warning as possible. Close coordination is necessary between weather personnel, ops people (including the Supervisor of Flying), tower operators and the maintenance sections to insure time is not wasted in carrying out the plan. Don't get caught napping with towering cumulus on the loose.

Early decisions and quick actions are imperative if you are to save valuable TAC resources from storm damage. Everybody talks about the weather and now we can do something about it – before it hits the fan. ➤

**These older photos are grim evidence of the awesome strength of severe storms.**



A tornado hit Holley Field, Florida, on 26 May 1973 and caused over \$71,000 damage, including this "dead-bug" O-2A. All aircraft had been properly parked, grounded and moored, including tail boom ropes, gust locks and chocks. When you get a direct hit with a tornado, these precautions don't help much, but quick response did prevent damage to other aircraft near this unfortunate O-2. Without prompt action, the damage cost could have been in the millions.

# DOWN

GROUND SAFETY  
Quotes and Notes



# TO EARTH

Down to Earth Ground Safety Quotes and Notes

**Always try to drive so that your license will expire before you do.**

## **SHOPPING FOR A BICYCLE?**

The US Consumer Product Safety Commission estimates that nearly 419,000 persons suffered bicycle-related injuries serious enough to require hospital emergency room treatment in 1973. As the popularity of bicycles increases, so does the number of accidents. Many of the accidents resulted from mechanical and structural problems. Many of these problems could have been prevented if more care had been taken when the bicycle was purchased. The US Consumer Product Safety Commission offers the following tips if you happen to be shopping for a bike:

Choose a child's bicycle to fit his size as he is today, not one he will "grow into" later.

A bicycle should suit the rider's ability and kind of riding.

In addition to the required reflectors, tape retro-reflective trim to the fenders, handlebars, chainguards, and wheel sidewalls to make it recognizable in the dark as a bicycle.

Check for a headlight and taillight. If it doesn't have lights, make sure they are available to install yourself.

Check hand and foot brakes for fast, easy stops without instability or jamming.

Avoid slippery plastic pedals. Look instead for rubber-treaded pedals, metal pedals with serrated rattrap edges or firmly attached toeclips.

Don't buy a bicycle with sharp points and edges, especially along fenders, or with protruding bolts that could scrape or tear clothing.

Don't buy a bicycle with gear controls (or other protruding attachments) mounted on the top tube of a man's bicycle.

## **DRINKING AND DRIVING**

If you can select the time you drive, avoid being on the road late Friday and Saturday nights. The Highway Safety Research Institute at the University of Michigan reveals that during these hours your exposure to drinking drivers is at its greatest. One in 70 drivers you meet will be definitely drunk, one in 20 will be legally intoxicated, and one in seven will have had enough drinks to impair driving ability.

## **FUZZY**

### **FIRST AID TIPS**

W. C. Fields once said, "Out of the mouths of babes often comes oatmeal." True, but besides oatmeal, some of the funniest safety tips ever offered came from a fourth grade class in Edmonds, Washington. The kids were quizzed on first aid, and their teacher revealed some of the responses:

For head colds: "Use an agonizer to spray the nose until it drops in the throat."

For nosebleed: "Put the nose lower than the body."

For fractures: "To see if the limb is broken, wiggle it gently back and forth."

For fainting: "Rub the person's chest, or if it is a lady, rub her arm above the hand."

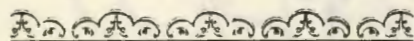
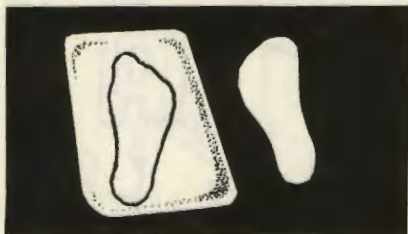
For asphyxiation: "Apply artificial respiration until the victim is dead."

You had better hope you never need any fourth grade first aid while travelling through Edmonds, Washington!

# OUTDOOR ALMANAC

## Self-Help Insoles

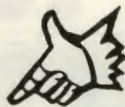
If you have a penchant for cold feet, save a couple of clean styrofoam trays from packaged meat. Trace the outline of your feet on the trays, cut them out and insert 'em into your favorite boot. The insulating properties of styrofoam will help keep your feet warm and provide a little extra cushioning. After a time, the pads will flatten and lose their effectiveness so you'll have to replace them but — what the heck, the price is right!



## I Can...Canoe?

Does your canoe leave a wiggly wake on the water? This usually means there's too much weight in the bow. Move your cargo (or the overweight frontseater) to the rear and you'll have a more controllable and safer canoe.

TAC ATTACK



The safest paddling position in rough water is kneeling with your buttocks resting on the edge of the seat or thwart. Use extra-large sponges for knee pads — they serve double duty, sopping up water and keeping the inside clean and dry.



Never leave large knots in either the bow or stern lines. If the rope is accidentally trailing in the water, the knot can get caught between rocks and turn you broadside to the current.

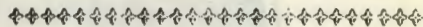


Tie that canoe or kayak very securely on top of your car or truck. Tiedowns on both bow and stern can prevent it from turning into a deadly missile during highway travel.



"Deliverance" — a movie based on the great novel by James Dickey — might have made white-water canoeing a little too attractive to neophyte adventurers. Within 13 months of the film's release, eight persons drowned in the fast waters of the Chattooga River in north Georgia — the filming location of the movie.

Wet shoes or boots can be very uncomfortable as well as hazardous to the health of your feet. They can cause "immersion foot," blisters and, in cold weather, speed up frostbite. If your idea of "roughing it" is a motel with only black and white TV, and have electricity available, a portable hair dryer does an excellent job. If, however, you are really in the sticks and can't find a "current" bush to plug the dryer into, try this old trick: Heat up a pail full of clean pebbles or sand over the campfire and pour them into your boots. In a very short time your footwear will be good and dry.



## HUNTING & VISION

The American Optometric Association offers a free pamphlet to avoid vision-related hunting accidents. The pamphlet, "Vision and Hunting," outlines optical skills necessary for hunters, including ability to judge distance, identifying colors, peripheral vision and seeing under a variety of light conditions. There is also some good advice for hunters who wear glasses. To get a copy, simply send a self-addressed, stamped business-size envelope with your request to: Public Information Division, American Optometric Association, 7000 Chippewa St, St Louis MO 63119. ➤

Watch out for the BS\*



\* BUG SMASHERS



**Near Miss Report (F-111).** An F-111 just missed a civilian Bonanza during a SID departure. The '111 was in a right climbing turn when departure control advised them of traffic at 11 o'clock, one mile. The instructor pilot in the left seat had his vision partially blocked by the canopy bow and his WSO saw the Bonanza first. The IP then saw the bogey, pushed the stick forward and the Aardvark passed about 200 feet below the Beechcraft. The civilian was not in contact with departure control, was flying in the TCA with no clearance, and since he took no evasive action, it's doubtful if he even saw the F-111.

**Near Miss Report (F-100).** The Hun, an F model, was executing a Precautionary Landing Pattern into its home drome, an international airport. At 1-1/2 to 2 miles on final, a Cessna 150 passed 50 to 100 feet under the F-100. There was not time for evasive action. It's believed the Cessna was on a left base for the right parallel runway, but the tower did not have him either visually or on the radio. The bugsmasher was on RAPCON frequency, but was having radio difficulties and RAPCON didn't know of his location. This report concluded with a warning that light aircraft operate in the local area with "inadequate radio equipment that affords them little or no communicative capabilities at times." Amen.

**Mid-Air (T-29).** The T-29 was on an IFR clearance on final approach, under GCA control, when it collided with a Cessna. It was dark, but clear, with a visibility of seven miles. Since it was VMC, the pilots of both aircraft were equally responsible to see and avoid other traffic. The two blips merged on the controller's radar scope — then disappeared; both aircraft crashed into a river. The private pilot and his passenger were killed and all seven crew and pax of the T-29 perished.

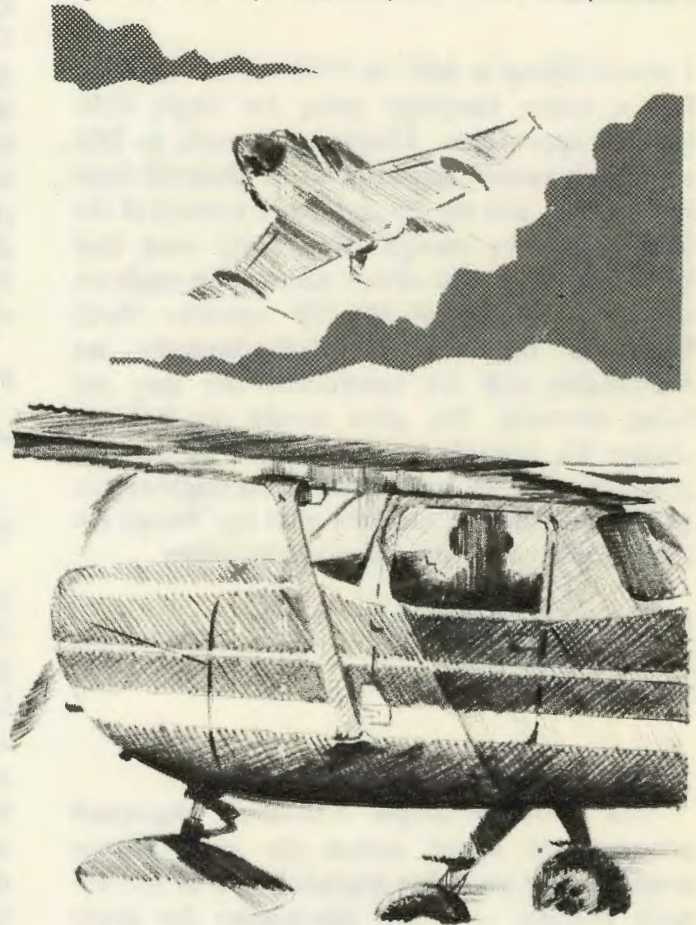
Without recounting the tragic statistics listed under "mid-air," there are several tips worth passing on to you who share the crowded skies with bugsmashers.

1. The experience level of light civilian aircraft pilots may be very, very low. We all had to start somewhere, and most of us began in (and some of us still fly) light, unsophisticated aircraft. If, like me, your initial pilot experience was in a bugsmasher, think back to how little you knew on your second or third solo flight. If, on the other hand, your flying background is strictly UPT jets carrying relatively sophisticated electronics, you'll have to use your imagination. Briefly, look for the bugsmasher to be where he shouldn't, at any altitude, in any weather condition. NEVER FEEL YOU ARE SAFELY IN THE ARMS OF MOTHER RADAR.

2. Most light civilian aircraft do not have the highly sophisticated and extensive electronic gear you may take for granted. Few light aircraft operators can afford more than one nav-aid, a backup radio, or inflight radar. You should use everything you have available (including the ol'

eyeball) to avoid other aircraft. REMEMBER, WHEN YOU ARE ON AN IFR CLEARANCE, UPON REQUEST, ATC CAN PROVIDE YOU WITH TRAFFIC ADVISORIES RELATIVE TO OBSERVED TARGETS NOT UNDER IFR CONTROL.

3. Bugsmashers have a right to the skies, too. The civilian pilots Federal Aviation Regulations (FARs) basically coincide with AFR 60-16 in regard to VFR flight-with one important exception: the civilian pilot can



fly VFR outside of controlled airspace and below 10,000 feet MSL (or 1,200 feet or less above the surface regardless of MSL altitude) WITH FLIGHT VISIBILITY OF ONLY ONE STATUTE MILE. Remember, if you are on an IFR clearance and the visibility is one statute mile or more, you are responsible for avoiding VFR traffic.

Keep these points in mind, especially at lower altitudes and near airfields. Use every external light available in the traffic pattern even in the daytime. Keep your ear tuned for "bogey" calls and keep looking 'til the controller calls "no factor" or you've got him safely in your sights. Oh, yeah... one more thing... I swore I wouldn't use this term, but what the hell, I can't think of a better way to say it... SEE AND BE SEEN. ➔



# FLEAGLEGRAM

## RESPONSES FROM THE FRONT

### FLEAGLE:

I started flying in ADC in 1959. At that time, we had a major campaign going for single UHF channel approaches. Changing channels in IFR conditions caused attention to be diverted from instruments, and the up and down motion of the head aggravates vertigo. We finally won that battle. Now a similar attack needs to be made on excessive changing of IFF/SIF squawks. Mode "C" and the new four-digit squawks are outstanding aids for controllers, but they are being overused. The pilot should not have to change his squawk from the time he starts a penetration or en route descent. In single-engine aircraft and the F-4, only the pilot can change the IFF. In IFR conditions, it's a vertigo getter.

PETER HARLE, Lt Col  
16TRS Ops Officer  
Shaw AFB SC

*The SFA or Single Frequency Approach program has about solved the radio change problem, and we're fast approaching a fix for IFF code changes — a real aggravation for single seaters and F-4 drivers.*

*Programmable ATCRBS (Air Traffic Control Radar Beacon System) have recently been installed in FAA facilities and the AN/TPX-42(DAIR) capability in military RAPCONs and GCAs. Acronyms aside, this means at airfields with this capability, the single code approach is possible. With these systems, the en route or center-assigned code can be discreetly decoded and displayed, including altitude readout. No code change is necessary.*

*Even at the older facilities not equipped with the Direct Altitude and Identity Readout equipment, procedures are used to keep from*

*requiring a code change on handoff from center to approach control or approach control to GCA. Only when the aircraft remains in local traffic for transition or subsequent GCAs, is a common code assigned. The single code is now in effect at several TAC bases and has been installed at Shaw since you wrote your letter. If you are still having problems, call SMSgt Kirby at the 2020 Comm Squadron at Shaw's Flight Facilities Office — he'll be glad to answer any more specific questions you may have about Single Code Approaches.*

*Fleag*

---

Fleagle:

This report concerns the shock hazard of the A-7D FLR radome. This organization had an incident occur which could have resulted in the loss of personnel and equipment. An A-7D aircraft had returned from a flight, was refueled and towed into the hangar. The crew chief who was walking under the nose was hit on the head and knocked to the floor by a static electrical discharge from the radome. The arc jumped approximately 2½ to 3 feet and later, in an effort to determine the source, another arc jumped 6 to 8 inches to a ground wire.

Facts: 1. Aircraft was properly grounded. 2. Incident occurred approximately 2 hours after flight. 3. Weather conditions: cold, light snow.

I suspect the charge buildup occurred in flight due to the snow. Since that time, radomes are being discharged after flight using a discharge wand. During the cold and snowy days, nearly all A-7D radomes have had charges. The radome coating material is in question and an EUMR has been submitted. In the meantime, A-7D maintenance crews should be warned not to touch the FLR radome after flights, especially if

the weather conditions are prime for static electrical charge buildup.

Don Lovisone, MSgt, COANG  
140TFW/LGMAQ  
Buckley ANG Base CO

*Right, you are. A check with TAC LG reveals that the only problems experienced so far from this type of static discharge have been in areas with low prevailing temperatures and humidity — like Buckley. Incidentally, "Oak City" is publishing an interim safety supplement to warn of this potential hazard until a cure can be found. Thanks for helping us spread the word.*

*Fleag*

*P.S. If you want a copy of instructions for local manufacture of a shorting rod, contact L. O. Burk, ATVN 935-2793, MMBT, Oklahoma City ALC.*

mention and that the safety officials should consider such hazards by adding messages or warnings to some TOs to help prevent these accidents.

Mr. Jim L. Wong, AFETS  
474 TFW/AMS  
Nellis AFB NV

*Most TO's warn of the hazards of working while wearing watches and rings. Since mishaps like you mentioned still happen, however, it never hurts to keep pushing the point.*

*I have two questions: (1) How long had the pull-chain been broken? (2) How come no one attached a piece of string to the broken chain or put a new pull-chain on the switch? Sometimes a quick fix to an inconvenience can break a dangerous chain of events (no pun intended). —*

*Fleag*

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## Ring or Finger Deal

FLEAGLE:

When the U.S. had occupation forces in Korea during WWII, we were stationed at Seoul. It was there we witnessed an accident called the "ring or finger deal."

A soldier in the Engineering Battalion was attempting to turn on lights in the room. The light switch was operated by a pull chain, which was broken and had only a few inches remaining. He was too short to reach the chain, so he tried to reach the switch by jumping up to it. He was unaware of a nail that was next to the light socket and in his effort to reach the chain by jumping, he caught his ring on this nail. As a result, his finger was completely torn off. This accident would not have happened if the man had given a thought to what he was doing.

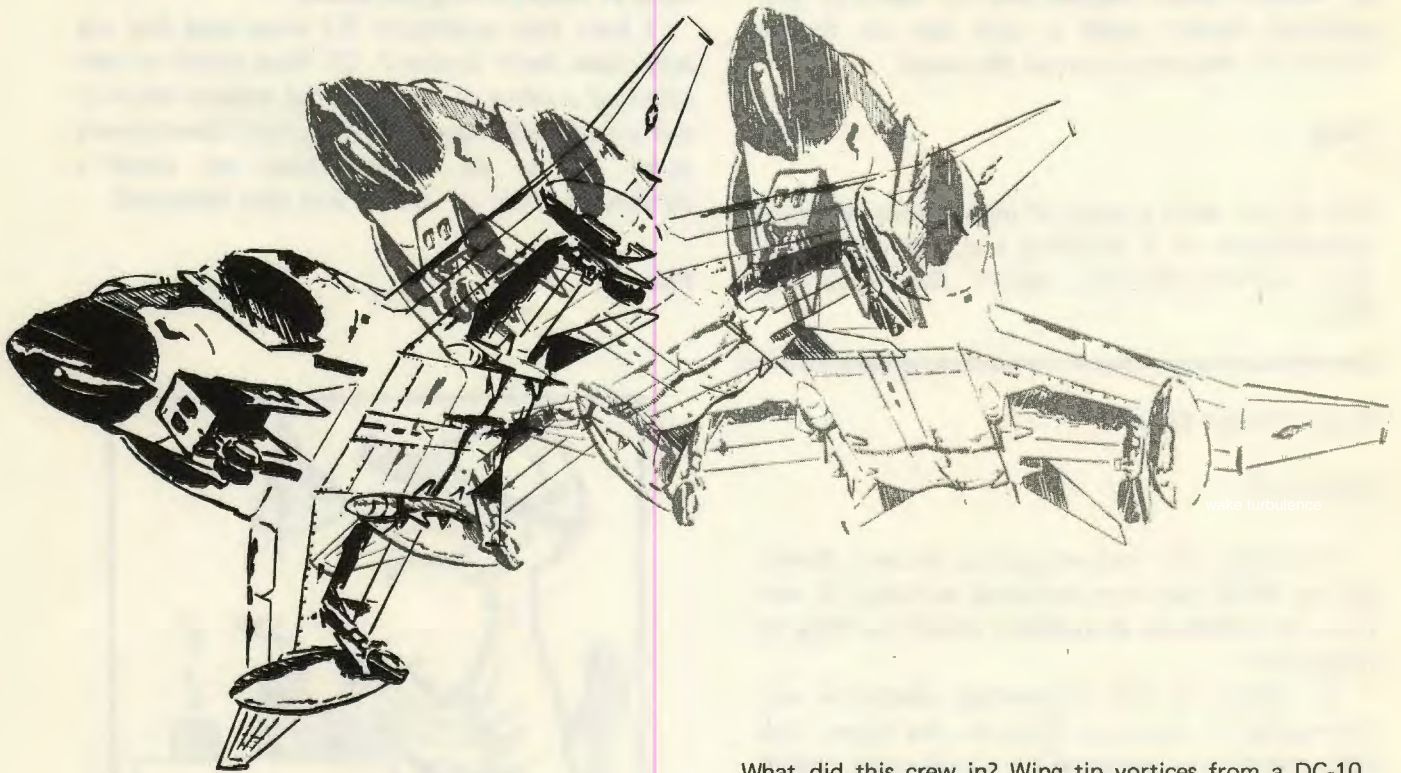
I'm an instructor on aircraft safety and have always pointed out the hazards involved with the wearing of rings. I feel this is worthwhile to



Hey, guys! Some of my friends tell me y'all haven't gotten my new Fleaglegrams in your units yet. If your Wing Safety doesn't have any, have them drop me a line and I'll rush them some to distribute to you. I'm waiting to hear from ya . . .

Fleagle

# wake turbulence



The T-39 was on final to a civilian airfield, 2 miles out, about 450 feet AGL. The Sabreliner rolled violently to the left (about  $120^{\circ}$  of bank), recovered to a wings-level attitude, then rolled to the left again. The pilot rolled wings level again, just as the aircraft impacted the ground about a half mile short of the runway, 400' left of centerline and skidded about 700' through a wheat field. Both pilots escaped through the ground escape hatch.

What did this crew in? Wing tip vortices from a DC-10 that was about 3 miles ahead of them. Sound familiar? Read on.

First of all, we will be using the terms "heavy" and "jumbo" jets in our discussion, so let's clarify them. "Jumbo jets" are the super heavy aircraft. Four aircraft fall into the jumbo category . . . Douglas DC-10, Boeing 747, Lockheed L-1011, and the Lockheed C-5A. All aircraft with a takeoff weight capability of 300,000 lbs or more are "heavy jets." Heavy or jumbo, these big mothers can turn you downside-up.

FAA and military controllers have certain responsibilities to protect aircraft flying behind these "heavies." This includes providing spacing for all IFR

aircraft and VFR departures following a heavy aircraft. IT DOES NOT INCLUDE SEPARATION FOR VFR AIRCRAFT, EXCEPT FOR DEPARTURES. For VFR aircraft, the controller is responsible for issuing a wake turbulence caution advisory, followed by appropriate traffic, and IT IS THE RESPONSIBILITY OF THE PILOT TO PROVIDE HIS OWN WAKE TURBULENCE SEPARATION OR AVOIDANCE.

Let's take a closer look at the controller's responsibility for IFR aircraft and VFR departures, and the pilot's responsibility for VFR separation.

1. Controllers, other than USAF, will provide nonheavy aircraft 5 miles (radar) or 2 minutes (nonradar) separation when operating behind heavy or jumbo jets. They will provide 10 miles or 4-minute separation to USAF aircraft operating behind jumbo jets ONLY WHEN REQUESTED BY THE PILOT.

2. USAF controllers will provide the same separation as non-USAF controllers to nonheavy aircraft operating behind heavy aircraft. When such aircraft are operating behind jumbo aircraft, USAF controllers will automatically provide the 10 mile or 4 minute separation.

3. In VFR operations, other than departures, both the controller and the pilot have a responsibility. If, in the controller's opinion, an aircraft may be adversely affected by potential wake turbulence, the controller is obligated to issue cautionary information to the aircraft concerned and warn him of the vortex-generating traffic. (Example: "SOAPY 23 CAUTION WAKE TURBULENCE, DC-10 THREE MILES ON FINAL.") It then is the pilot's responsibility to establish and maintain wake turbulence separation or avoidance. The pilot must know the effects of wake turbulence, be able to mentally picture where the vortices are, and exercise avoidance procedures with the same degree of concern as in collision avoidance.

A recent ALMAJCOM message concluded its warning to pilots this way:

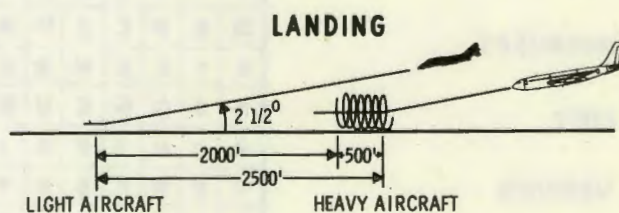
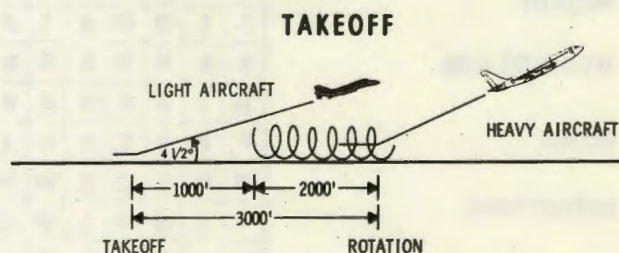
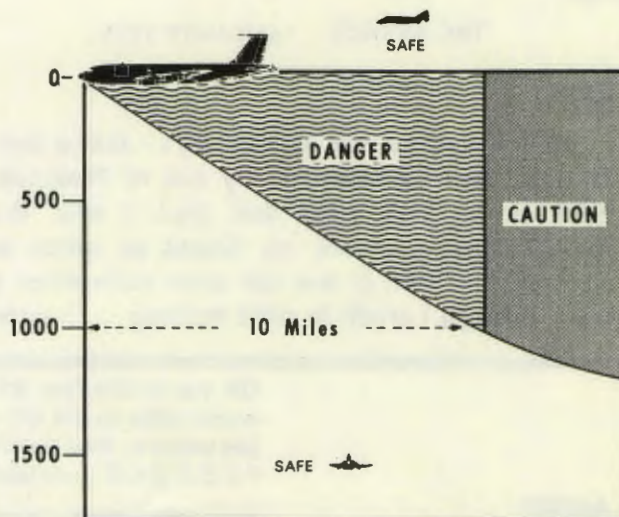
*In most cases, pilot actions are the most direct and effective means of reducing wake turbulence hazards. It is essential that all flight crews have both a complete understanding of the dimensions of the potential hazard and the knowledge of avoidance methods.*

In addition to notifying the controller of your spacing request and providing your own VFR spacing, here are a few more tips taken from the wake turbulence article that appeared in the August 1974 issue of TAC ATTACK:

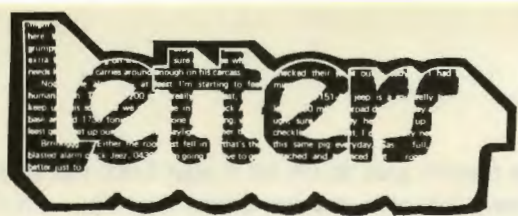
1. Trailing vortices descend at about 400-500 FPM and level off about 1,000 feet below the generating aircraft. So stay at, or above, the heavy's altitude. If you must fly below and behind a heavy, stay at least 1,500 feet below its altitude.

2. On takeoff, plan to lift off at least 3,000 feet short of the heavy aircraft's rotation point. If you can't, wait until the vortices dissipate.

3. Land at least 2,500 feet past the heavy's touchdown point. If your landing roll won't permit a long landing, request a 360 or take it around to get more spacing.

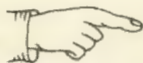


The ultimate responsibility for avoiding wake turbulence is — you guessed it — the pilot's. As more and more of these aluminum overcasts fly the friendly skies with their smaller cousins, these hazards increase. An inverted ILS ain't no fun!



letters

sads the frequency. Remen.  
oo, Guard frequency is there to.  
your use, so don't hesitate to use  
"Navy/FAA Common."



TAC ATTACK JANUARY 1975

Editor:

Hey! Come on, you stick benders - take a look at your own backyard! I fly out of Pensacola NAS as an A-4 pilot and find I hear the Eglin/Tyndall complex on Guard as much as Navy/FAA - and it was the same ratio when I went through Laredo in pilot training . . . I agree

Guard may be used improperly and at the wrong times. We should all try to be more aware of our abuses of the emergency frequencies. Let's get together and talk about the time and the place to use Guard. Encourage its use. I've been in the attack community since pilot training. Your publication is, in my opinion, one of the best in circulation - but let's encourage communication between us - not discourage it.

Rivalry - but friendly rivalry! . . . No low pull outs and watch your six (airborne).

Capt T. A. Demosthenes, Jr., USMC

*OK. - let's get together and talk about it - come up on 243.0. Seriously though, we do intend to keep the rivalry friendly - check our Aircrewman of Distinction on page 7. Anchor-clankers, bus drivers, and grunts alike could use more sticks like Lt Comdr Sewall . . . Keep your feet dry - ED*

OK you puzzle fans, let's check your perception. Buried somewhere in this maze are the words listed to the left of the box. The words may be horizontal, vertical or diagonal - but watch it, they could be spelled backwards. We've circled one of the answers for you - F-L-E-A-G-L-E - probably a bigger hazard than any of the others on the list.

ABORT

THUNDERSTORM

MIDAIR

HYDROPLANE

ICING

BIRDSTRIKE

FOD

OVERHEAT

LOST

VERTIGO

SPIN

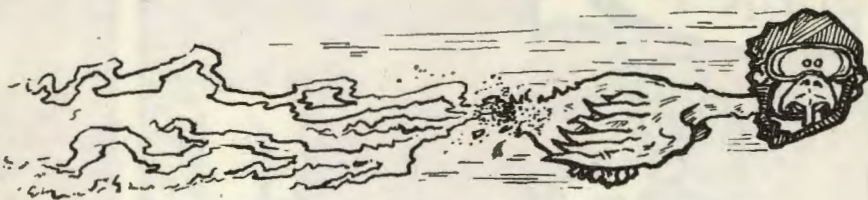
PRESSING

STALL

HYPOXIA

B	H	N	S	Q	W	F	D	C	L	E	S	E	H	Z	B	G	A	E	T	K	O	E	T
V	E	C	B	E	C	G	O	E	O	G	F	B	L	A	R	H	X	Z	R	Z	L	H	N
A	H	E	G	C	H	B	L	B	L	C	S	Q	E	Q	E	L	P	R	L	E	U	N	E
C	L	O	Q	K	L	F	N	Z	T	F	R	L	W	S	R	A	B	E	H	N	L	K	N
E	Z	H	A	E	G	E	H	L	E	L	A	F	L	G	O	E	Q	N	D	E	B	E	Z
H	T	B	X	H	X	R	A	C	N	F	C	P	E	A	L	S	P	E	W	B	Q	H	N
P	E	S	E	V	H	L	B	D	B	W	L	O	K	Z	T	Q	R	A	S	M	K	L	F
W	H	C	O	C	W	D	O	E	L	F	N	E	Q	W	Z	S	H	Q	W	X	W	E	H
L	E	N	A	L	P	O	R	D	Y	H	V	B	D	Q	T	C	M	L	E	K	P	K	C
V	K	Z	B	Q	B	R	T	K	H	Q	G	D	S	O	R	G	F	E	Q	N	Z	H	E
E	I	N	L	W	C	S	E	Y	J	E	B	C	R	C	F	N	E	S	H	W	F	L	Z
Q	R	P	C	E	D	A	P	S	N	N	Z	M	I	D	A	I	R	A	Z	B	P	N	F
K	T	A	E	H	R	E	V	O	S	A	C	W	E	C	F	C	B	F	M	L	K	W	L
B	S	Q	G	C	U	K	G	B	A	I	V	E	B	K	H	I	O	C	H	A	E	C	H
A	D	H	B	P	E	J	S	E	D	B	N	D	F	A	E	M	V	E	F	W	M	F	D
G	R	D	X	S	X	V	C	F	L	E	A	G	L	E	C	N	D	S	J	E	B	L	N
P	I	H	O	A	H	Z	N	G	S	M	N	P	D	H	F	K	Z	E	T	N	W	C	H
Z	B	G	N	G	L	N	S	B	Z	L	D	E	C	V	E	Y	H	L	S	E	V	N	B
B	N	L	R	E	E	W	M	A	N	F	U	S	H	F	B	Y	S	K	D	R	G	V	E
H	X	E	H	W	Q	L	N	B	M	Q	H	W	J	E	P	W	E	Q	E	T	V	N	G
E	S	R	X	Q	N	W	S	V	E	R	T	I	G	O	E	V	G	V	S	W	Q	B	H
V	N	L	B	F	L	M	N	N	Q	L	E	M	X	W	C	K	H	L	E	H	V	Z	C
N	E	Z	N	L	X	E	Q	L	M	W	N	I	P	S	H	W	B	V	W	K	D	W	Q
K	C	S	A	B	D	H	G	E	F	H	A	W	B	C	E	A	S	H	V	E	P	J	H

# TAC TALLY



TOTAL ACFT. ACCIDENTS	▶
MAJOR ACFT. ACCIDENTS	▶
AIRCREW FATALITIES	▶
TOTAL EJECTIONS	▶
SUCCESSFUL EJECTIONS	▶

JAN	TAC	
	Thru Jan	
	1975	1974
3	3	2
3	3	2
11	11	2
2	2	0
0	0	0

JAN	ANG	
	Thru Jan	
	1975	1974
1	1	1
1	1	1
0	0	1
0	0	0
0	0	0

JAN	AFRES	
	Thru Jan	
	1975	1974
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0



FIGHTER/RECCE WINGS		
ACCIDENT-FREE MONTHS		
82	33 TFW	TAC
49	4 TFW	TAC
34	127 TFW	ANG
31	31 TFW	TAC
29	121 TFW	ANG

OTHER UNITS		
ACCIDENT-FREE MONTHS		
145	130 SOG	ANG
125	2 ADGP	TAC
114	136 ARW	ANG
106	143 SOG	ANG
94	DET 1, D.C.	ANG

## MAJOR ACCIDENT COMPARISON RATE 74-75

TAC	74	4.5											
	75	7.9											
ANG	74	7.2											
	75	5.7											
AFRES	74	0											
	75	0											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	

# FLEAGLE

