

TAC ATTACK

TAC Attack

NOVEMBER 1969



FLAT SPIN...Page 12

Flat spin... page 12

for efficient tactical air power

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NOVEMBER 1969

VOL. 9 NO. 11

TACTICAL AIR COMMAND

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JAMIE SEZ:

He with ham hand, may take ride in meat wagon.

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TACRP 127-1

Articles, accident briefs, and associated material in this magazine are non-directive in nature. All suggestions and recommendations are intended to remain within the scope of existing directives. Information used to brief accidents and incidents does not identify the persons, places, or units involved and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. Names, dates, and places used in conjunction with accident stories are fictitious. Air Force units are encouraged to republish the material contained herein; however, contents are not for public release. Written permission must be obtained from HQ TAC before material may be republished by other than Department of Defense organizations.

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Angle of ATTACK



the loading checklist

The loadcrew's checklist is perhaps one of the most important "flying" documents in use today. Its purpose is simple; it enables a properly trained and coordinated group of men to load ordnance on an aircraft safely. Sound simple? It is to a point, but there are some who don't seem to understand the ramifications of this task. You need only to read the incident and accident reports to realize that a select few, self-chosen incidentally, seem to think that they can do it without checklist help.

Luckily for us, this group is but a small percentage of the people who load our aircraft. At that, they cost us thousands of dollars monthly, not to mention the fatalities which turn up as a matter of course when carelessness and complacency is mixed with high explosives. For example, guns which are supposedly safed, fire . . . full "drops" have been jettisoned from combat aircraft on the ramp . . . and very recently, a fighter on takeoff lost two bombs. One detonated, high order, below him on the runway. It hurts in other ways too: it's not comforting to carry tons of bombs hundreds of miles, roll in on the target through the toughest flak in history, and never drop a bomb.

Using a checklist when dealing with ordnance is only good sense. We have weapons which range in destructive power from a round of ball ammunition to awesome multi-megaton nuclear weapons. While you, as a load team member, won't load all types in your present job, you could be responsible for ten or more "loads," or combination thereof. It should be obvious to all, that tasks of this magnitude cannot rely on memory . . . with assurance that the operation will not endanger lives or equipment.

And a special word of caution for load chiefs. Understand this: Use of the appropriate checklist is required by regulation. To load without it must be considered an act of negligence . . . obviously, it's deliberate! These are hard words, but the loss of life and equipment through failure to use checklists just can't be considered accidental!



R. L. Liles

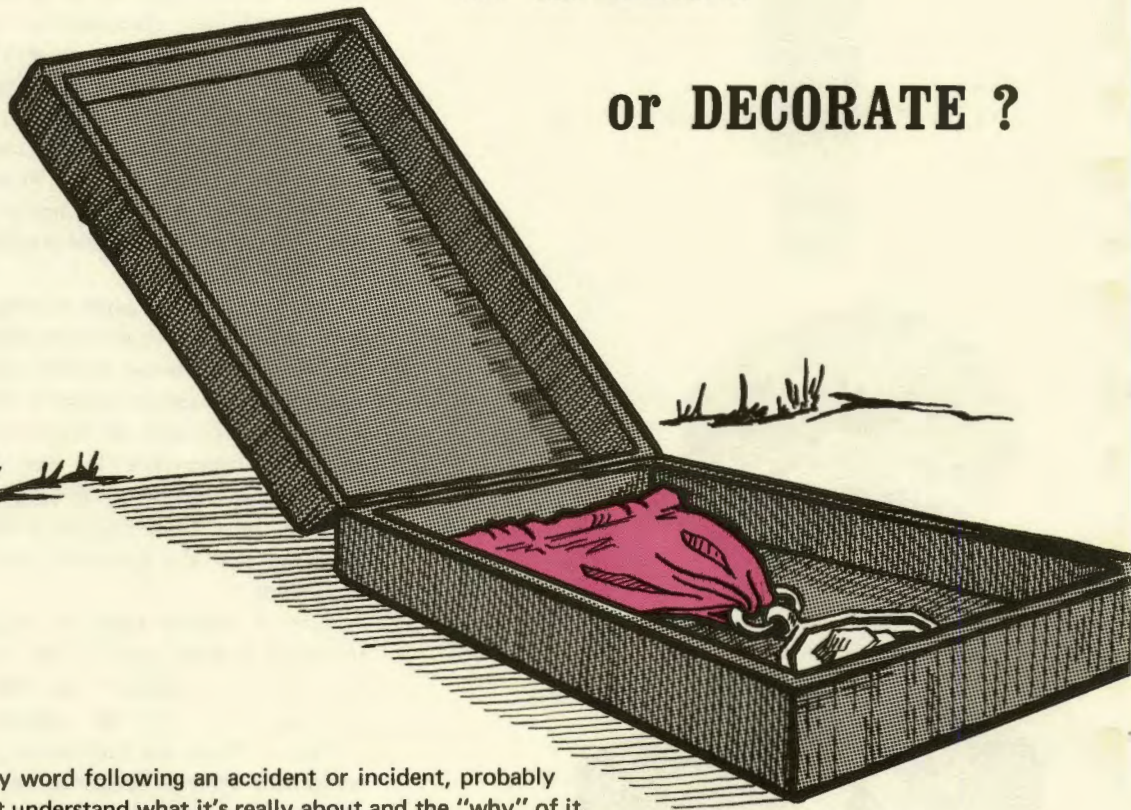
R. L. LILES, Colonel, USAF
Chief of Safety



COLLATERAL

... to HANG

or DECORATE ?



"Collateral" is a dirty word following an accident or incident, probably because most of us don't understand what it's really about and the "why" of it. The following article, published in the June '69 United States Army AVIATION DIGEST, covers the subject very well in layman's language. Lt Colonel Collins has done an outstanding job of presenting the facts surrounding the mysterious "collateral," we hope this explanation will take some of the mystery out of dual board proceedings we have on occasion. The only changes we found necessary, were to change the regulation references from Army to Air Force. Ed.

by Lt Col "Rip" Collins
United States Army

Considerable fog apparently shrouds this dark and ugly term **COLLATERAL**. It is appropriate to spend a few words to clear away this fog and create a new outlook concerning the **COLLATERAL INVESTIGATION**.

Let's first discuss investigations common to aircraft accidents within the military services. Each service has its own responsibilities relative to aircraft accidents. They may be called by different names, but they can be separated into two distinct categories, according to purpose:

Accident prevention and safety.

Determination of all facts and circumstances for reasons other than accident prevention and safety.

The accident prevention and safety investigation is called the aircraft accident investigation. It is a thorough and systematic examination and analysis to disclose all relevant facts, conditions, and circumstances associated with or surrounding each aircraft accident. It is conducted for the sole purpose of accident prevention.

When an investigation is conducted for any reason other than accident prevention, we apply the general term **COLLATERAL** to describe this action being taken.

COLLATERAL means side by side or parallel. Therefore, these investigations, conducted for other reasons, and at the same time as the safety investigation, are parallel to the aircraft accident investigation. This is the origin of the general and accepted use of **COLLATERAL INVESTIGATION**.

What other reasons might there be to require an investigation paralleling the accident investigation? To answer this question, we must understand the conduct of and restrictions placed upon investigations. The ultimate goal of each investigation is to uncover all cause factors surrounding a particular accident. Appropriate steps may then be taken to eliminate these factors and reduce the probability of recurrence of identical or similar accidents.

Quite a task, you say? Yes, but not beyond reason. With proper training of board members, command emphasis on the importance of finding accurate cause factors, and the timely and appropriate use of facilities and specialists at our disposal, an accident investigation can usually reveal all cause factors involved in an aircraft accident.

The factors causing an accident can be determined only if certain guidance is established concerning the

manner in which this information is to be used. AFR 127-4, paragraph 19, explains the nature of information contained in a report of an aircraft accident investigation. It says, in effect, that the report is to be considered privileged, and its contents will not be released to the general public. It will be seen only by those persons needing the information for accident prevention purposes. It is for official use only. Claims for or against the government cannot be based on this report. The investigation report can in no way be used to determine negligence or culpability on the part of any individual directly or indirectly involved. It cannot become the basis of administrative or punitive action.

Why is it necessary to be so tight lipped about the cause of an accident? Are we trying to protect our aviators or cover a goof-up? Not on your life! The answers become apparent if you imagine yourself in the position of a crewmember in, or a witness to, an aircraft accident. Consider how you would describe the series of events leading to an accident if you knew that your testimony could be used against you for administrative or punitive action.

Did you goof in any way? Heck no! While no sane person would come right out and lie about the situation, his testimony probably will become slanted, and certain relevant facts might well be overlooked under these circumstances.

Would you reveal improper techniques used by a friend, knowing this information might be used against him? Perhaps, but only with genuine reluctance. It would probably appear to the board as though they were pulling teeth to get any useful information from you.

Do you see the point now? Remember, the intent is to determine the facts surrounding the cause of the accident during the accident investigation. This is necessary to determine accident prevention measures which will prevent the recurrence of similar type accidents. And that's all we want to do!

Now, back to the original question about the reasons for other types of investigations. The first is to have information available about every accident which can be released to the public. As mentioned, information gained by the aircraft accident investigation cannot be released. The only information which can be released must come from other type investigations. This report should be completed prior to the accident investigation report and submitted through channels to the Judge Advocate General Section for consideration prior to release.

Any aircraft accident can cause damage to private

COLLATERAL

property. The possibility always exists that a claim for damages may be filed against the government. All facts and circumstances concerning damage to private property must be documented for possible future use in a claims court. The other type of **COLLATERAL INVESTIGATION** is conducted in accordance with AFM 112-1, chapter 4, for claims investigation. A similar requirement exists when an accident results in death or serious injury. Documentation is necessary for use in claims for or against the government. This is another type of **COLLATERAL INVESTIGATION**, with the report going to JAG.

Suppose an accident occurs in which it appears the pilot willfully violated regulations or was negligent in the performance of his duty. This sometimes happens. Some corrective action is necessary if we are to maintain standards of conduct within which we are to operate. Again the **COLLATERAL INVESTIGATION** must be the only basis upon which such action can be taken without compromising the contents of the safety investigation report.

AFR 110-14 indicates such an investigation may be required when there is need to provide official factual documentation of all matters pertaining to the accident which can be used in connection with any legal or administrative action. This just about sums up the position that all accidents need some documentation which can be used for purposes other than safety.

How about the conduct of these **COLLATERAL** or other types of investigations? Are there differences? Will the result be the same as in the safety investigation? AFR 110-14 defines the limitations of **COLLATERAL INVESTIGATIONS**. These are to be completely independent of and separate from the accident investigation. The report of any other investigation **CAN** be used for various administrative, disciplinary, and litigation purposes. It **CAN** be used as a basis for fixing pecuniary liability, and may adversely affect individuals concerned. Since it can cause concern to the individuals involved, certain restrictions must be placed on the manner in which information is gathered.

First, the report of an accident investigation cannot be used in any other investigation. Witnesses who appeared before the accident investigation board may also be called by the collateral board. They cannot, however, be questioned concerning their statements or other matters presented during the accident investigation. Persons appointed to the accident investigation board cannot serve as members of a board conducting a **COLLATERAL INVESTIGATION** of the same accident.

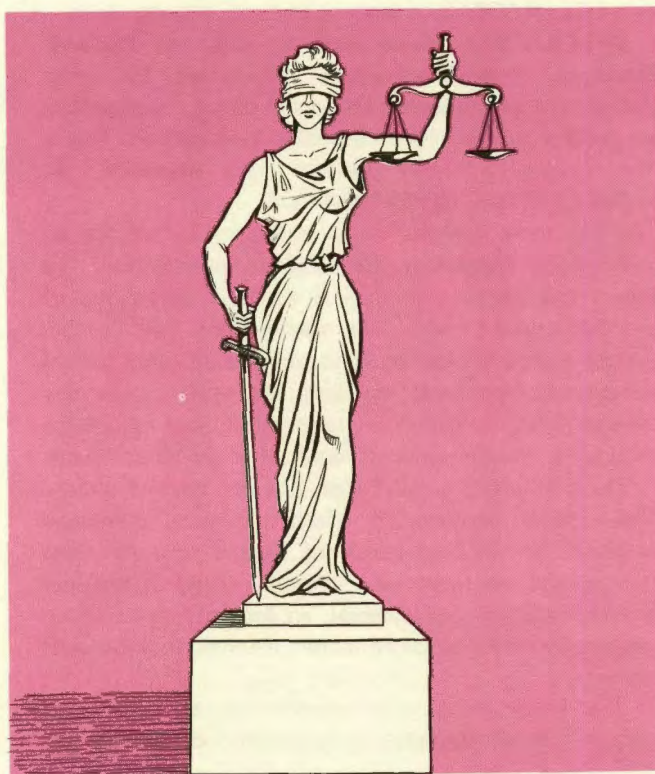
Although a member of the accident investigation board may be called before another board as a witness, he cannot be asked or required to divulge privileged testimony or his opinion based upon that testimony. Actually, any testimony gathered by the accident investigation board, in the interest of accident prevention, which could be detrimental to any person involved, is considered privileged testimony and cannot be divulged by any member of this board.

Under no circumstances can any person having knowledge of the substance of the accident investigation report be required to divulge the findings or recommendations to any other investigation board.

It is not the intent to try to penalize every person who makes an error. Certainly, errors must be expected from human beings. Aviators, though human, are expected to exhibit the characteristics of normal, prudent individuals. When one fails to exhibit these characteristics through flagrant violation of policies and regulations, or complete disregard for safe operational practices and procedures, he can certainly expect a collateral board to point out such weaknesses and recommend appropriate corrective action.

Remember — the collateral board will always serve to protect the report of the aircraft accident investigation board. It will also serve to protect your interest when your interest deserves protection. ➤

U. S. ARMY AVIATION DIGEST

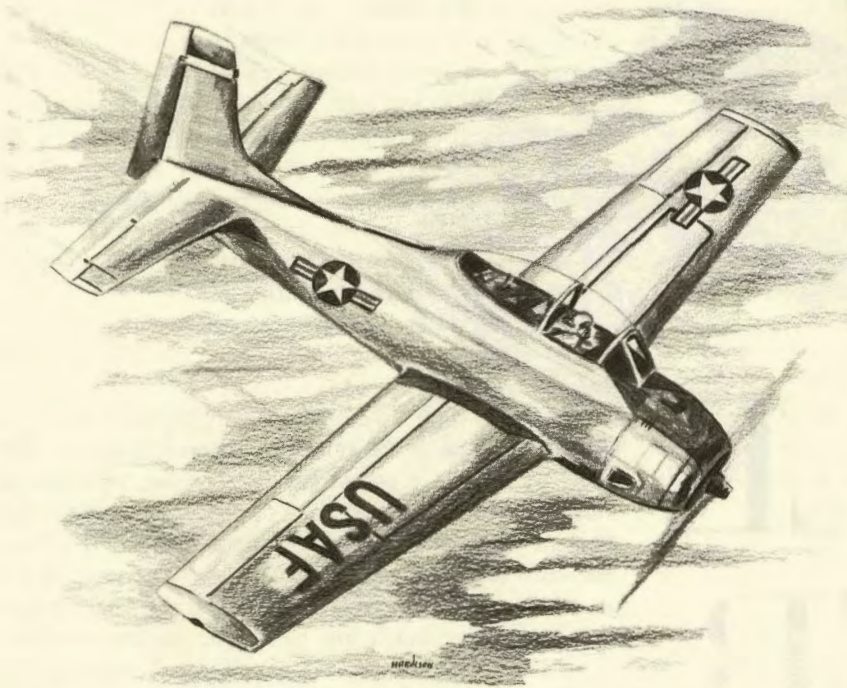
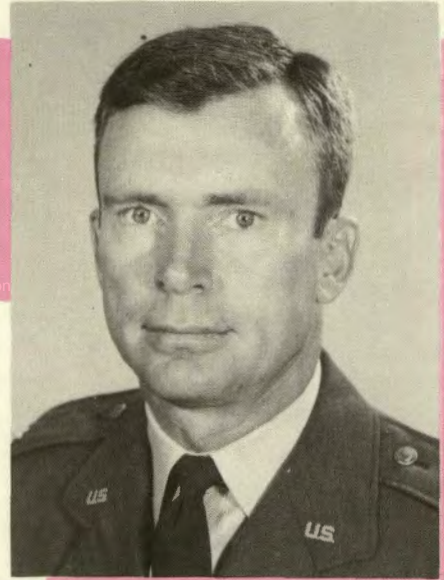


TACTICAL AIR COMMAND

Pilot of Distinction

Pilot of Distinction

Maj R. E. McClure



Major Roger E. McClure of Det 1, 603 Special Operations Squadron, Hurlburt Field, Florida, has been selected as a Tactical Air Command Pilot of Distinction.

On his initial solo mission in a T-28D, approximately 25 nautical miles east of Eglin AFB, Major McClure saw the chip detector light illuminate. He immediately adjusted engine power and started a slow climb toward Eglin AFB. He declared an emergency and received clearance to land direct from his position to the airfield. Ten miles from Eglin, at about 6000 feet altitude, the engine operation became very rough and oil pressure dropped to 10 psi. Immediately heavy black smoke poured over both wings and the cockpit filled with smoke.

Major McClure initiated engine shut down by moving the mixture control to OFF. As the smoke inside the cockpit cleared Major McClure checked for evidence of fire and aircraft control response. Turning the aircraft toward an abandoned airfield he set up a glide to a high key position and a successful power-off pattern and landing was made on the 5000 foot bomb-cratered runway. Careful maneuvering of the aircraft on the cratered runway prevented further damage and normal egress was made from the aircraft. Major McClure discovered severe burn damage on the right rear fuselage caused by the inflight fire from burning oil.

For many years reflective tape sewn on fatigues and jackets has helped make our flight lines safer places to work at night. To appreciate the effectiveness of this material one would only have to visit a base at night and be exposed to an unlighted flight line with random lighting units to the side of your vision as you drive from one end to the other. As you would guess, your night vision is constantly being destroyed by spotlight units pointed your way. Add a light rain and the potential for an accident jumps many times.

This reflective tape, or "retro-reflective materials" as they say in the trade, is authorized in TO 14-1-4 for USAF use. It is the same material used to "illuminate" road signs and mark obstructions on our highways and streets. Its ability to "light up" in approaching headlights makes it much more difficult for a driver to strike an object since he will see it at a greater distance. Drive anywhere on our highway system or in our cities at night and you'll see this reflective material used extensively — but only on inanimate objects. However, the odds against seeing a pedestrian or a cyclist (bicycle or motorcyclist) wearing this reflective material are astronomical. Do we think more of our concrete and steel than human lives?

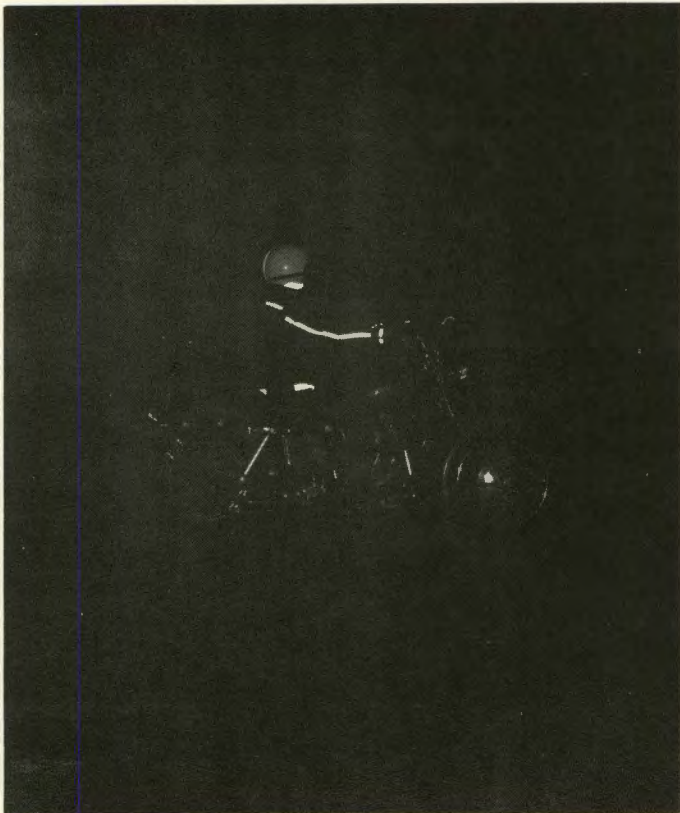
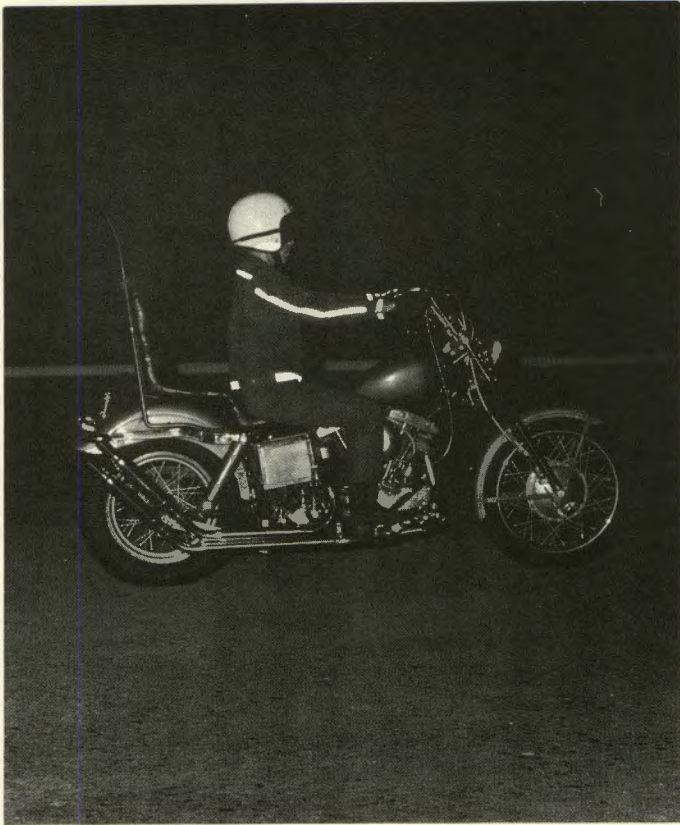
The April 1969 issue of the USAF DRIVER Magazine featured the use of this reflective material sewed on, and being carried by, a pedestrian. For our bag, we chose to illustrate what it can do for a cyclist. Our subject is Sgt Richard Hunter of the 4500 Air Base Wing Safety Office. He has been active in cycling for over nine years and is acutely aware of the hazards of cycling at night. We gave him some tape and a free hand, you see the results at right. Even the most skeptical among you must admit that it is very effective. The outlined sleeve coupled with an arrow on his glove, pictured in the lower right photo, graphically illustrates the potential of this material.

There is no end to other uses for retro-reflectives. It can also be used on a bicycle to serve a decorative purpose during the day, while doubling as protection for your child at night. (Yes, Virginia, children do cycle on the streets and roads at night.) It can be used on raincoats and boots, it can mark your driveway. On your auto's bumper it will signal other motorists if you are stalled on a busy highway, and on and on.

For information on sources and other applications, contact your friendly Base Ground Safety Office right now. ➤



CYCLE SAFER



TAC TIPS

...interest items, mishaps

"CHOCKFUL" OF CONFUSION

They all were busy with their separate crew duties. In fact, so busy they didn't really function as a crew. Coordination and the immediate business at hand was forgotten.

The Provider copilot checked out his radios, computed takeoff data, and concentrated on cleaning up his paperwork. The flight engineer flipped switches, monitored gauges on his panel, and busy-worked in preparation for backing out of the revetment. The loadmaster scanned to the rear and fixed his gaze on an encroaching aircraft, advising the pilot of a rear-end "bird strike" hazard. The pilot stopped backing, moved his throttles to forward thrust range, rode the foot brakes, and waited for the taxiing aircraft to clear his tail zone. Everybody was back-up oriented, except the prop blades.

Then the tower tossed in another confusion factor. They advised all aircraft about a new altimeter setting. Dutifully, the pilot leaned forward and cranked in a new Kollsman window reading. As he did, his foot pressure relaxed on the brake pedals. Binders eased, the bird rolled in the direction the blades were bent, forward. By the time the loadmaster interphoned, "Stop," the pilot couldn't without "nosing" into the revetment wall . . . 53 manhours worth.

And the "straw" that punched the Provider's pinocchio? All of this lack of crew attention, missing coordination, setting of parking brakes, and so forth, could've been negated if a simple local directive was followed: In revetments, put a chock in front of the nose wheel!

NIGHT STRIKE

The crew completed their low level mission and were returning home at 12,000 feet. After passing Anytown VORTAC in what appeared to be VFR conditions, the aircraft suddenly entered a cloud. The pilot immediately initiated a descent and lightning struck the nose of the

aircraft. The front-seater lost his night vision, but was able to see the instruments. His navigator in the rear cockpit received shocks on both elbows from the canopy rail. The pitot heat, CNI, and radar circuit breakers popped, and were reset. The indicated airspeed and FLR remained out. The aircraft was joined by another RF who monitored his airspeed on final and helped complete an uneventful landing.

CHAFING AND F-4 FIRES

The two incidents quoted below illustrate that the age of your F-4 is no indication of whether or not you will have an inflight fire. One is an RF-4C, the other a new F-4E:

"Immediately after takeoff, gear and flaps up, the left fire warning light illuminated. The light went out when the pilot retarded the throttle to idle. Fire loop test was normal and a chase aircraft confirmed there was no visible evidence of fire. Fuel was dumped, and the aircraft landed without further incident. The cause of the fire was a ruptured torch igniter signal line. It had been chafed by the oil pressure transmitter line till it failed."

"After about an hour of flight the auto pilot was engaged for about five minutes. When it was disengaged the master caution light failed to illuminate. The tele-light panel circuit breaker was popped and would not reset. The IP elected to make an immediate landing. In the pattern it was noted that with equal RPM, the right engine fuel flow was 3500 pounds and the left engine indicated 2900. No other abnormal indications were noted, and at no time did fire warning lights illuminate. The post flight inspection revealed that there had been a fire in the right engine bay. Oil had leaked from a chafed line and was ignited by hot air from a BLC leak in the right engine bay. The oil line was chafed by contact with the afterburner fuel on - off signal line. It's a good thing the oil line was the one that gave up first."

with morals, for the TAC aircrewman

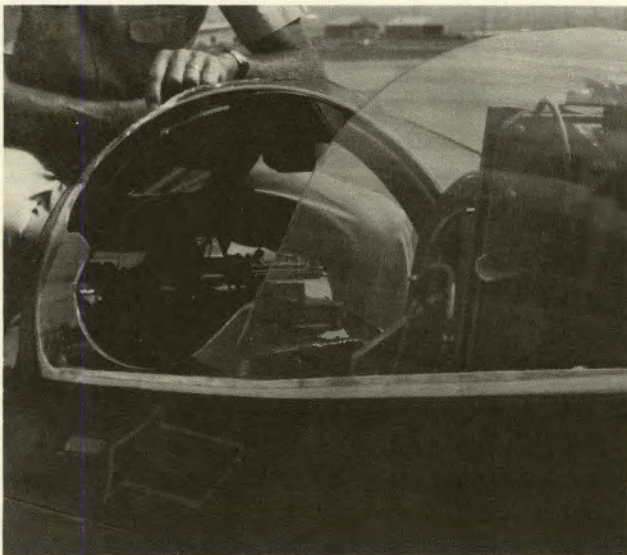
THE CASE FOR VISORS

Here's an F-100 incident that occurred across the small pond. It should convince any skeptics left of the value of your visor. This pilot came off his fourth strafe pass pulling four Gs at four hundred knots. His nose was above the horizon when the canopy shattered and pieces of it hit him in the face. His visor was down, fragments from the canopy broke it but he suffered no facial injuries. Many of the canopy fragments removed from the cockpit after landing had red paint marks on the jagged edges from the pilot's helmet.

The cause was a ricochet which struck near the top of the canopy bow. No foul had been committed and the range had been recently cleaned and plowed. We see again that it's virtually impossible to avoid the ricochet. When you get yours, be ready — HAVE YOUR VISOR DOWN!



Ricochet impact on canopy bow

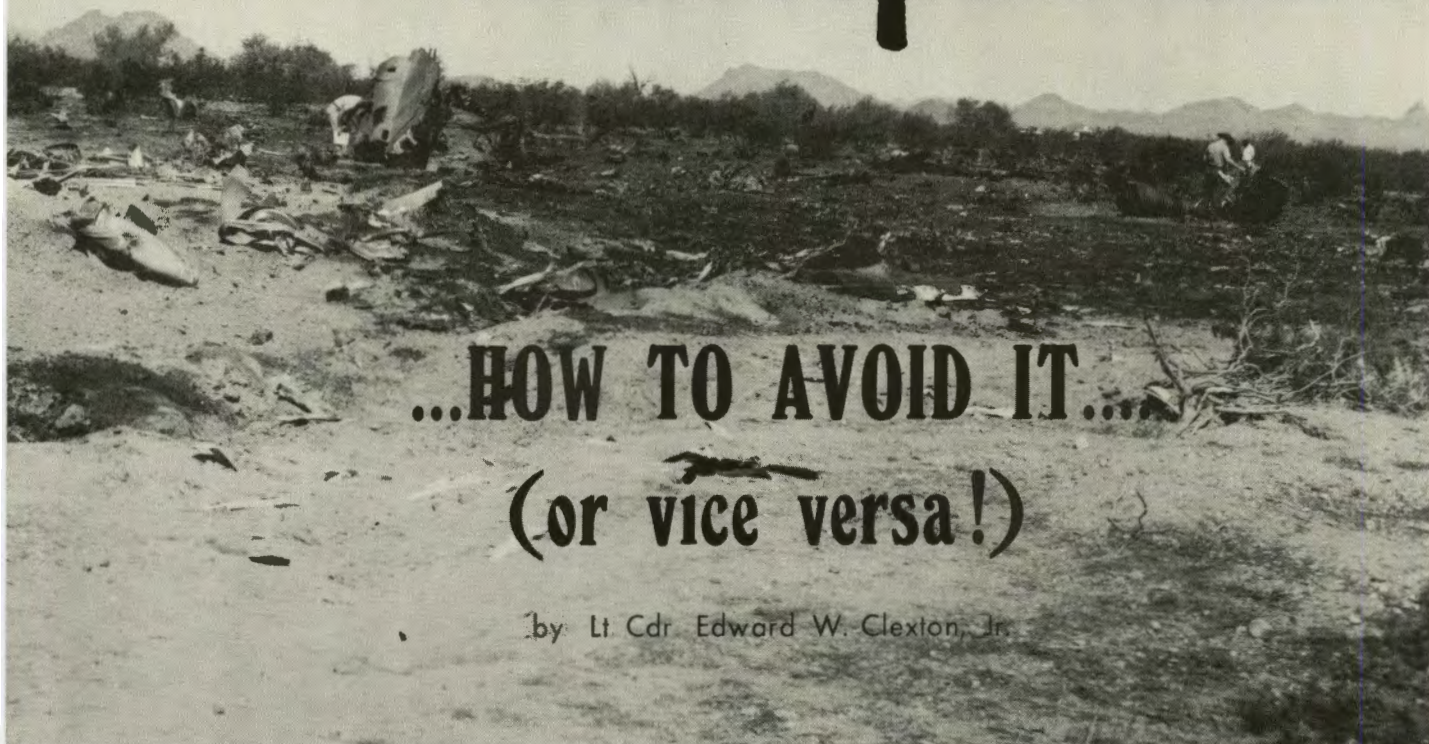


**Pieces of canopy and pilot's visor
taken from cockpit**



View showing missing portion of canopy

The flat spin



...HOW TO AVOID IT... (or vice versa!)

by Lt Cdr Edward W. Clexton, Jr.

Lt Cdr Clexton started flying the F-4 in early 1962, did two WestPac cruises with VF-143 aboard the USS Constellation, attended the U.S. Navy Test Pilot School in 1965, and then worked two years as a project pilot in the Flying Qualities and Performance Branch of Flight Test at the Naval Air Test Center, NAS Patuxent River, Maryland. He is currently the Operations Officer of the Fighting Aardvarks of VF-114 at NAS Miramar, California, and fresh from his third WestPac cruise flying the Phantom from the USS KITTY HAWK.

How many F-4s have been lost in flat spins? How many guys have stayed with an airplane trying to stop a spin from which there was no known recovery? How many jocks did the wrong thing impulsively and consequently drove their Phantom into this spook of all spins? How many times have spinners and wingmen disagreed on the direction of spin rotation and thereby set the noose for the accident board to put the pilot's head in?

The answers to these questions will never be known

but through the present, a lot of megabucks worth of Phantoms have found themselves in an equal number of pieces spread from Germany to Vietnam and we're only talking about the ones that spun in.

What do we do about it now that the airplane is 10 years old? Redesign? I don't intend to go into "cost effectiveness" because I'll immediately lose all the readers. Education is the only cheap answer and it is far from foolproof. We've got ourselves an airplane that most of us love to fly, but it's not the ultimate and we've got to admit that the upper lefthand corner of the flight envelope is like the Tijuana jail. It is a lot easier to get in than to get out. There are a million ways to get yourself slow, cocked-up, in a high angle of attack, in buffet, etc, but there's only one way to get yourself out of there once you've gone past that magic point — and who really knows where that is? There are as many "knock-it-off and recover" points as there are methods of looking for them. The best gauge we've got is the angle-of-attack indicator and even that's got enough lag in it to be 4-5 units behind the airplane depending on the pitch rate you've been

demanding. You can canvass 100 bars in any one night and find guys who'll tell you it's all done by the "seat of the pants." That's all well and good if you're a tactics instructor with over 1000 hours in the bird, but when you've got 200 hours and find yourself punching off the tanks and ordnance you've been carrying for the last six months to engage a MIG, I'll bet against the "seat of your pants." The buffet level is at least 80 knots across and is not really that much heavier at 25 units than it is at 20 units where you find yourself quite often in an engagement. There are just too many variables, and when you've got an airplane that can lose 70 knots per second, it doesn't take long to go from cruising flight to stall — so it's easy to stall the airplane.

The next step is the crux of the problem, my reason for writing, the phase worth 10 times the briefing, the airplane saver, and the step that keeps the safety officer at home. *If you don't have a couple dozen recovered stalls to your credit, you weren't really getting to know the airplane when you went to that Stateside school.* We have to prohibit spins because of the consequences, but a knowledge of stall characteristics is a must to be able to use the machine properly. Now we use the same vehicle to get out of the predicament that put us there — the controls. Here we go back to that landing aid (the angle-of-attack indicator) and fly the needle with our hand. To relax back pressure on the stick is a natural reaction and you actually have the feeling that your hand is connected directly to the nose as you push it over. As the airspeed gets lower and lower the amount of stick travel required for an AOA change increases quite a bit so a fair amount of forward stick is required, and who cares if you pop in a little negative G as long as you don't stall it inverted with the nose still way up. We're aiming for that 5-10 units area until the airplane is back under control and you're ready to proceed with the mission at hand. That's the angle-of-attack control part and by far the easiest to handle.

The hard part is the unnatural and hard-to-understand action of the lateral controls. This is the part that has got to be covered over and over even to the point of mechanical action, because it is against what our senses are telling our brain to do with our hands. Once you've departed from controlled flight and are in what's called a post-stall-gyration, the ailerons do not stop the rolling in the conventional manner. In many cases violence of the gyration was probably highly influenced by how you were holding the lateral controls prior to stalling the airplane. At high angles of attack deflecting an aileron causes a yaw in the other direction and dihedral effect (roll with yaw) will actually roll the airplane in the direction opposite from that intended. Being smarter than the machine, you feed in more of that aileron and if you're still stalled at

this point enough adverse yaw is generated to send you off into a spin. The reasons may not be the most easily understood, *but the power of those ailerons is real and, without question, it's the misuse of lateral control that has sent most of these airplanes to their graves.*

I've spun the airplane to the left with full right rudder, full aft stick, and less than 10 degrees (max is 30 degrees) of right aileron. If that was confusing, read it over. What I'm saying is that at a high angle of attack (beyond stall), the left yaw generated by less than one-third right stick travel is sufficient to overcome the full right rudder and send the airplane off into a spin to the left. OK, OK, OK — I'll keep the stick in the center. That's not so easy either. If you're holding on to it while you're bouncing around the cockpit, you're moving it. To get the angle of attack back below stall you've got to hold on to the stick, so it takes concentration to keep it centered. Some of our Allies have marked the center of the instrument panel of their swept-wing wonders so the pilot can place the stick on it for post-stall-gyration recovery.

What we've been trying to do is recover from a stalled condition by reversing the original action that put us there — control AOA to below stall by use of the longitudinal control (the stabilator) — and prevent entry into a spin by centering the stick and rudders — hopeful that not enough yaw was already started to send us on our way. If the two requirements for a spin are stall and yaw, then our spin prevention consists of simply controlling the two of them.

The Handbook tells us that if the airplane is not whipping back into shape after you've fed in the forward stick with the aileron and rudder neutral then put out the drag chute. It's an aid and accomplishes the same objectives you set out to attain. The chute is trying to align the airplane with the relative wind and if it succeeds, the AOA will decrease and the yaw will stop. The results speak for themselves.

There are many cases of successful post-stall-gyration recoveries using the drag chute, and sad enough, many airplanes crashed with the drag chute still in its housing. There's no time for pride to try for several turns and then expect the drag chute to solve all. The probability of the drag chute working early in the post-stall-gyration is high, but after a few turns in a fully developed spin the probability goes way down. If you're out-of-control and can't get the AOA down below stall, and the airplane is giving you a full 360-degree panoramic view of the horizon, get the chute out now. You'll probably go around another turn or so and then be elatedly thrown against the shoulder straps as the airplane dissipates what energy is left by rolling (not spinning). The airplane will accelerate and the chute will shred somewhere above 200 knots, so don't be in any big hurry to get rid of it. Put the

flat spin...

handle back down and start programming the nose back up as the airspeed increases. The Phantom is no slouch when pointed straight down, so you've got a good pull-out to make, but whatever you do, don't get it up past stall AOA again. Remember it takes 5,000 feet to pull out of a 90 degree dive programming up to 4 Gs after starting at 300 knots. Believe me, the airplane will be up to 300 before you've collected your wits enough to start your pull-up.

Now what if you've disregarded all said up to this point (I'm surprised you're still reading!), or even having done all that's recommended, you find yourself in a spin. The stick is centered, the rudder pedals are centered, the drag chute handle is up, the AOA is still pegged at 30 units and the sun is going by about every 6 seconds. Well, if you're below 10,000 feet get out of the airplane, because it's going to hit the ground. If you've got more than 10 grand, you can try the aerodynamic recovery. It's the aerodynamicists way of stopping the yaw by plugging the controls into a formula. The one that does all the work again is the lateral control. We put full stick in the same direction as the spin. It's the same 'ol adage — if you want to yaw to the right (or stop the yaw to the left) put in lots of left stick. Put it all in and hold it against the side console. We use full aft stick mainly to keep the rotation rate down (that's part of the formula) but it also allows more airflow over the rudder. The reasoning behind the rudder is the obvious — full rudder against the spin.

Now comes the tricky part — once the yaw stops you're sitting there with a beautiful set of cross controls for a spin in the opposite direction, so you've got to be quick in getting those controls back where they belong for a simple stall recovery — that's centered and forward. The timing is really important. If you anticipate by a second, you'll wrap right back up into a continuation of the original spin; if you're a second late, you'll reverse into a spin in the opposite direction. It's impossible to tell when the yaw is going to stop so you just have to wait for it. When it does stop though, start that stick forward, neutralize the rudders and get on that AOA gauge like you should have way back up there at altitude where this whole mess started — what seems like three years ago. If it worked the first try all you've got left is the pullout bit. If it reversed you've got to snap the stick and rudder to the new appropriate corners. Recoveries within one turn after reversals were common when we did this in test and for some reason unknown to the author, much cleaner. When we stopped the spins without reversals, it would wallow, roll and yaw back and forth for a few seconds, whereas



stopping the spin after a reversal resulted in fewer subsequent oscillations.

All of this spinning, recovering, reversing, etc, takes time and altitude, so I repeat again — if you don't have the spin stopped by 10,000 feet, get out!

Determining the direction of spin is not difficult and it's a lot more confusing from outside looking in than it is from sitting in the beast looking out. I'll agree with the driver in any case of disagreement between him and his wingman, ground observer, etc. We don't require the pilot to know his left from his right, just to be able to put the stick in the same direction as the airplane is spinning. Every instant the nose is cutting across the horizon you are reaffirming to yourself that that's the way it's going and consequently that's where you have the stick. A case of *wrong-way controls* is a problem of education (not knowing procedures), not a problem of sense of direction. You've got to get this info by looking out the bay window. Yes, the turn needle will be in the direction of the spin and you can match the stick with the turn needle (if you can find it), but you'll never catch a reversal without looking outside. It's for this reason, the airplane cannot be aerodynamically recovered from a spin in the goo.

All right, there is such a thing as a flat spin mode, but no one knows how many there have been. We had one early in test and then had to abandon the test bird after the special emergency spin chute system didn't operate properly in our second flat spin. The guys in the safety business can show you pictures of airplanes pancaked on

the ground, but they don't know if they went flat while the guys were still in them, or after they left.

The one I had the displeasure of riding through was intended to be a steep oscillatory spin to the right beginning with the application of full pro-spin controls from a level stall above 40,000 feet. Nearly 15 seconds went by with the airplane stalled and feinting to the left but not really doing anything specific except falling like a rock. Not getting the desired results from the inputs, I neutralized controls about the same time a yaw rate was beginning to the left. The nose went 90 degrees down in the first half-turn, back up to the horizon, and then with very little oscillation in pitch and roll after that, took off in a very rapid spin to the left. I had not been in a flat spin previously, but within 2 turns I knew I was there. Not being too anxious to investigate flat spins at the moment I popped out the drag chute at about 30,000 feet. After a couple more turns and verification from the chase pilot that the drag chute was just streamed, I deployed the large 30-foot anti-spin chute. We had used it once before from a fully developed spin and it had worked in 2 ½ turns, so I waited 3 turns with all the confidence in the world awaiting the opening shock, but it never came. The chase pilot again confirmed suspicions – it was floating in the breeze beside the airplane, but not blossoming! The only thing left on the agenda was to try to set up some oscillation which would perhaps break the flat spin into a steep one or maybe move some slipstream to the right places so the chute would blossom. I was methodical for a few cross control cycles, but all that happened was an increase in the yaw rate when I had the stick forward (up to 120-degrees per second). Finally, after a few concrete mixing cycles, I arrived at 10,000 feet on the way down and stepped over the side using the seat pan ejection handle. I received a few broken vertebra (which I never felt) for the days work, and the airplane pancaked into the marshes on the eastern shore of Maryland. Luckily, a search party for the canopy turned up the films intact a week later. All in all, the airplane took 34 turns to hit the ground but it was sans pilot for the last ten.

The difference between the flat spin and the normal steep oscillatory spin are easily related. The steep spin is very oscillatory in pitch, roll, and yaw rate. In a normal steep spin the wings will be rocking plus or minus 30 degrees, the nose will be oscillating between 20-degrees nose down to 80-degrees nose down, and the yaw rate oscillates between 30 and 60-degrees per second. These values are relatively constant after three or four turns. The first few turns (when recovery with neutral controls and drag chute out is easiest) are noticeably more oscillatory, especially in pitch. Once the airplane has decided to spin flat, nothing is obvious except the yaw. The nose doesn't

move much, the wings don't move much, and the airplane just goes round and round in a hurry.

The reasons for the flat spin are vague and nothing specific can be pointed out as the culprit. Where a normal steep spin oscillates between 40 and 60-degrees AOA the flat spin varied from 80 to 90-degrees AOA. The one just described resulted from a very deep stalled condition. Stall occurs around 27 units or 30-degrees AOA and the airplane started spinning with the AOA already climbing through 60 degrees. It's beyond comprehension to think that someone could inadvertently get up to those regions of AOA, but I do believe (conjecture) that a jock who is using the wrong controls in trying to recover from a spin could aggravate the spin conditions, and drive the airplane through the steep mode into the flat mode.

This takes us right back where we started. Know exactly how to recover the airplane from a stall (control of alpha), and believe me when I tell you that it doesn't take much aileron deflection to start an adverse yawing motion once you're near or past stall. The combination will get you a spin every time. Just stick with the 5 to 10-unit recoveries, neutral controls, and drag chute recoveries from post-stall gyrations, and you can throw away the grim reading on spins themselves. ➤




To Break The Chain

The following excerpt is quoted from an endorsement on an aircraft accident report: "The loss of this aircraft and pilot again illustrates the well-appreciated fact that an accident is the final event in a long chain of circumstances. Many individuals involved could have broken that chain and prevented this accident."

The Safety Center files are bulging with accident/incident reports to which the same statement could be applied. Why is the chain not broken? Think back. How many times have you, upon discovery of an unsafe condition, stuck your head into the sand, thinking or hoping that the required initiative would be taken by another person? Far too often accident reports will state that numerous people had an opportunity to break the chain. In each instance, it was left to the "other" guy. It is realized that, at times, the desire to meet operational commitments tends to lead us into taking shortcuts or assuming that recognized hazards will be corrected by someone else. This is a mistake since the other guy has been proven unreliable. The responsibility rests with you. When you find yourself involved in a chain of events that may lead to an accident, break it by seeing that corrective action is taken. By doing this, our aircrews and aircraft will return from their missions and you will sleep much better.

Courtesy of NAVY CROSS



After reading the words at left in the United States Navy's September CROSSFEED, we thought it would make a good TAC TIP but delayed a little. However, a nudge from our Editorial Assistant made us read it again. We did — and then thought some more. In every issue of TAC ATTACK we describe too many accidents and incidents that could be prevented by a "chainbreaker" — somewhere. But why didn't they?

If you've ever been exposed to the daily message traffic documenting USAF's aircraft accidents and incidents, you realize that it is a near-hopeless task to even begin documenting all the real reasons behind these messages. Additionally, many cause factors fall into the "undetermined" category — so the only one who can tell you the accident's cause is the man who had a chance to break the chain... and didn't. The latter statement can even get a bit sticky. What if the accident involved an inspection procedure that was a bit unclear, or a Dash One emergency procedure that was considered to be misleading? These are actual examples; unfortunately, we get them AFTER the accidents when they are useless as you-know-what.

Our deep and delayed thinking that we mentioned earlier centered around a way to beat the odds and come up with a guaranteed "chainbreaker" that has the best chance of producing accident-prevention results. Guess where the trail led us. Straight to that too-seldom-used piece of paper called AF Form 457, or, the Operational Hazard Report! We won't go into the regulation (AFR 127-301) covering the system, you have all been indoctrinated on its applicability and use of the form. But, are you really sold on it?

Here are a few of the more important reasons why this baby will work when other methods fail. First, and it pains us to bring this up, THERE ARE PEOPLE WHO WILL PAY ONLY LIP SERVICE TO AN ACCIDENT PREVENTION PROGRAM! If they happen to be in your middle

management levels, verbal safety suggestions or recommendations won't be evaluated... let alone implemented. This is especially true if your suggestion involves something that has only a slight chance of happening. The cure to being ignored? Put it on an AF Form 457 and get a supervisor's signature under the denial. You may still end up with the same results, but your idea will have been evaluated. And it's on paper.

And how about leaving it to that "other guy?" At every job level your tasks will spill over to some degree into another person's area of responsibility. If you become aware of a dangerous situation developing in another work area, WRITE IT UP ON AN OHR. Remember, the "other guy" has been proven to be unreliable! For example: Suppose you see a man involved in LOX servicing without shirt, gloves, face protection, or apron. Does your accident-prevention duty stop with correcting him? Of course, it doesn't! Can't you picture what kind of training and supervision this man has had? An OHR will alert the commander of the unit (and others) and let him know that he has a deficiency in his supervisory staff. What we are trying to say: The basic cause of the rule's infraction must be corrected, not just one man's total disregard for his own life and those he jeopardizes.

We spend millions trying to figure out ways to break the accident chains that lead to tragic loss of lives and equipment. Unfortunately, we sometimes dwell, too long, on an accident that has happened and is now history. This is especially true of the spectacular ones, or those that stir the public's imagination and lend themselves to lengthy literary description. All this "reporting" goes on while there are other accidents constantly in the making. You can prevent many of these "accidents-to-come" with a slight expenditure of your time. You are the "link" that can break the strongest accident chain. And you do it with a pen, scribbling on an OHR. That's why the pen is mightier than the sword! ➤

FEED

CHOCK TALK

chock talk ... incidents and incidentals

... incidents and incidentals

RED-X'ER WASHED OUT

As an F-4 lifted off, the pilot felt excessive nose-down stick pressure, and no nose-up response to trim. On reaching altitude, the stick started binding when it was moved aft of neutral, requiring up to 60 pounds forward pressure to break it loose. He disengaged the stab-aug but binding continued.

To avoid risking a stall on landing, he came in low and fast on final, keeping aft stick movements to minimum. On the ground, inspection revealed a disconnected over-ride spring cartridge. The Phantom had just undergone compliance with TCTO 1F-4-864, a modification of the stab-feel balance assembly, which required cartridge disconnect. Whether the red-X clearance was an actual or paper inspection is in doubt. One thing sure, it wasn't adequate. This was made very clear to the signer, who, promptly was removed from red-X clearance authorization and enrolled in an FTD course on flight controls.

This may be a stiff price to pay, especially if the signer simply allowed himself to be forced into a cursory inspection because of a heavy work schedule. However, it could have been tougher on the pilot. Luckily, in this case it cost only a lost flight... and probably some "maintenance butterflies" for many flights to come.

THAT'S ALL ?

The O-1E's mission called for marking two preplanned airstrikes. On the first, he fired from the right inboard launcher, and tried from the left inboard which didn't launch. On the second strike, he armed the left outboard

and pressed the trigger. It fired, and almost immediately, both left launchers jettisoned. He had enough left hanging under the right wing to complete the job, then headed home.

On the ground, inspection showed that "bits and pieces of copper wire" and other metal debris from fired rockets were imbedded in the wires causing a short in the left wing launcher jettison circuit when the trigger was depressed. The problem was a familiar one, it had happened before.

The unit found that locally manufactured conduit shields were authorized, but required up to eight man-hours to make and install. Corrective action was decided to be "continued careful inspection of conduits and wire bundles during periodics rather than install shields." Perhaps they should add, "and continue to periodically suffer equipment losses and mission aborts."

FORMS CAN KILL !

On roll-in for his second dive bomb pass, this A-1 jock was surprised by a roll to the right which took full left aileron to counter. His dive recovery began at four thousand feet and took fifteen hundred feet more than anticipated. The right forward inboard gun panel had torn loose from the wing. After speed was decreased below two hundred knots control was eased, the emergency landing went off without a hitch.

At sometime prior to this incident sheet metal work had been performed on the aircraft to secure this gun panel. The work was not adequate to secure the panel permanently and an entry was made in the 781 to the effect that the fix was for one flight only. Urgent mission requirements dictated the temporary fix. Later, the form entry was deleted and the gun panel was never fixed

with a maintenance slant.

properly. It had flown several missions in this condition.

Maybe we shouldn't kick about this one. After all, the panel could have come off on takeoff, or during a strafe run, or maybe even just after bomb release during a 4G pull-out. We could have lost the bird and pilot — and all for a little piece of paper. Wonder if an urgent mission requirement caused the confusion which had to exist to get that write-up deleted? Or was this red cross condition being carried on a diagonal?

ON HIS LAST DAY....

The task at hand was to leak check and trim number one engine of an F-4 already on the trim pad. A crew of four was dispatched, the crew supervisor would be in the cockpit, the other three would handle the required tasks under the supervision of Sgt X who would be responsible for all ground operations.

Communications were established between the supervisor in the cockpit and Sgt X on the ground. The engines were started, and after a few minutes, had to be shut down to re-rig the number one throttle. This was done, the engines were started again. During the leak check of the number one engine, Sgt X found a small leak around the cap of the BLC collector bowl. He discussed it with the supervisor who got the impression that the leak was on the left engine duct that goes to the BLC collector bowls. He knew that the collector bowls were under pressure and assumed that Sgt X also knew.

The engine was shut down and Sgt X proceeded to cut the safety wire from the clamp holding the cap and removed the back-up nut. He then used his screwdriver to pry the clamp off of the collector bowl. The clamp came off and the collector bowl, under pressure, struck him in the face inflicting facial cuts above and below his left eye,

and fracturing his cheekbone.

The cause, of course, was personnel error. Sgt X was completing his last day of duty before rotating to CONUS. He admitted that his mind was not on what he was doing — he knew that the collector bowls would be under pressure.

SHORT CUT TO DECERTIFICATION !

An AT-33A's range mission called for bombs and rockets only for ground attack tactics training. The pilot taxied to the arming area where the load crew mistakenly armed the two 50-cal guns. The pilot signaled that no guns would be used on the mission, so the crew dearmed the guns.

After the mission, the pilot stopped at the dearm area. Checklist procedures were accomplished, except for the guns, because they were supposedly "cold." The next morning the bird had to be prepared for a gunnery mission. The arming crew began by performing a functional check on the gun system. The crew chief asked his assistant to clear the right gun while he cleared the left. Later on, in the checklist procedures calling for "trigger depressed," the right gun fired a round into a woods.

No one was injured, but two load crews were decertified, and aircrews were briefed to make sure only needed weapons were armed before takeoff.

The shortcutting dearm crew permitted "supposedly" cold guns to be grounds for skipping that portion of the checklist. The morning's arming crew didn't even have an excuse. They obviously shortcutted several steps, including checking the firing-pin for retraction with an inspection mirror. It can't be done when a round is in the T-slot of the bolt where it must be to be fired!

Tactical Air Command

Unit Achievement Award

Our congratulations to the following units for completing 12 months of accident free flying :

7 Tactical Fighter Squadron, Holloman Air Force Base, New Mexico
1 July 1968 through 30 June 1969

8 Tactical Fighter Squadron, Holloman Air Force Base, New Mexico
1 July 1968 through 30 June 1969

9 Tactical Fighter Squadron, Holloman Air Force Base, New Mexico
1 July 1968 through 30 June 1969

46 Tactical Fighter Squadron, MacDill Air Force Base, Florida
28 June 1968 through 27 June 1969

428 Tactical Fighter Squadron, Nellis Air Force Base, Nevada
1 July 1968 through 30 June 1969

777 Tactical Airlift Squadron, Pope Air Force Base, North Carolina
24 June 1968 through 23 June 1969

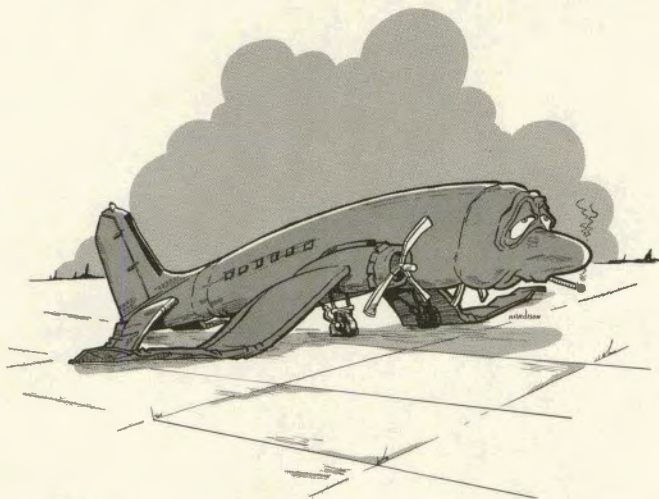
778 Tactical Airlift Squadron, Pope Air Force Base, North Carolina
16 August 1968 through 15 August 1969

4429 Combat Crew Training Squadron, Cannon Air Force Base, New Mexico
16 May 1968 through 15 May 1969

49 Tactical Fighter Wing, Holloman Air Force Base, New Mexico
1 July 1968 through 30 June 1969

188 Tactical Reconnaissance Group, Fort Smith Municipal Airport, Arkansas
29 August 1968 through 28 August 1969





We've all heard about that tired, run down feeling afflicting the too-old-for-cola crowd. It's a case of your "blooped blood" needing daily doses of some revitalizing tonic, complete with magic ingredients, and a word spelled backwards. Just a few quick jolts of this electrifying elixir restores your vim, vigor, and volatility (this is a clue!) in hours.

A faithful old Gooney needed a quick pick-me-up recently. Inflight, the Forever Flyer contracted a severe case of ROPROT (that's torpor spelled backwards!). And just as in humans (Gooney's almost human, but not quite) a reduction in energy level can lead to serious problems. Especially if your original designer (creator?) didn't endow you with great gobs of thrust in the first place.

That fatigued feeling came on after level off at 9000 feet when the pilot reduced climb power and fuel mixtures to cruise settings. Number one engine lost power and behaved like a recip suffering from fuel starvation. It didn't run rough, or even backfire. It just "drooped" a couple of hundred RPM and then recovered. After a few minutes the weariness symptoms reappeared. Aggravating the patient's discomfort, the right engine fell victim to the same ailment.

Concerned about contagious disease and hoping to halt the epidemic, the pilot scanned and analyzed. No out-of-limits indications. No carburetor icing. No low blood (whoops, fuel) pressure. Just puzzling fluctuations in power and RPM.

That's when the pilot prescribed immediate hospitalization and complete ramp rest for old Gooney at the nearest Air Force diagnostic center. He landed and committed the bird.

Determining the nature of our stricken Gooney's complaint wasn't easy. However, sparing no expense, the clinic's staff called in their finest specialists. They probed, tapped, and tested the inner workings of Gooney's circulatory, respiratory, and second-story systems. Stethoscopes checked heart beat. Muscle tone (engine noise) appeared adequate considering her age. Breathing, blood pressure, gross weight, all were within tolerances. Puzzled, the diagnosticians turned to science and the laboratory (in this soap opera it's pronounced lah-bore-atory!)

There, chemists discovered the awful truth: Gooney's fuel circulatory system suffered from a severe case of pooped petrol! Instead of being full of vim, vigor, and volatility, her fatigued fuel fumes just laid there, limp and lethargic. Her pistons were getting too little bounce from the ounce.

That stagnant stew in her tank averaged 4.0 PSI of vapor pressure in chemical analysis. The minimum acceptable is 5.5 PSI when fuel is purchased. Use limits on av gas range from 5.0 to 7.25 PSI of vapor pressure. The primary reducer of volatility is old age . . . just like folks. Although sealed storage can deter or delay the aging process, vented storage in aircraft tanks permits slow degradation of "fire power."

How long before av gas slows down in its ability to vaporize? The Gooney sat in flyable storage about six weeks, a comparatively short time as gasoline goes. She launched without reservicing the fuel tanks with "fresh" av gas. However, concern about possible fuel stagnancy doesn't usually develop until av gas is stored, unreplenished, for about six months. Sealed barrels of 115/145 have been tested and found up to vapor pressure standards after many years of storage.

How do you as an aircrewman know when your bird's fuel supply is as tired as you are? Any lack of exercise over a long period of time is a clue. Form 781 fuel servicing data carrying dates a couple of months old should make you suspicious. A fuel servicing unit of World War II vintage with U. S. Army Air Corps stenciled on the side is another "foot stomper."

If you have serious doubts about the vintage of the purple petrol in your tanks, consult with your friendly fuel specialists. They have the full knowledge you're needing. If they can't solve your problem locally they can call on the clever chemistry of a Boris Fueloff at the nearest lah-bore-atory. He'll keep your petrol perking! ➤





GROUND ATTACK

A recent study of TAC's syllabus-training accidents (CCT/RTU) during 1968 and 1969 charged to pilots or instructor pilots, pinpointed three phases of flight in which more than 50 percent of our total mishaps occurred: Landing, formation, and ground attack. We'll limit our discussion to the last phase, ground attack; and further, an accident which occurred while strafing. This one happened on a tactical range during a low angle strafe pass.

This has always been a nebulous area and the "no survivor" accidents we have recorded mostly fall in the pilot-error area. An interesting fact along this line emerged in the study mentioned above: In all operator-error ground attack accidents, there was no instructor pilot in the aircraft!

The student pilot involved in this accident had a total of 320 hours, including seventy hours in the type aircraft involved. He had been in the training course more than

four months, had completed more than 59 graded sorties, and was considered an average student. The mission line up was a flight of two with an instructor pilot in the second aircraft. Following a formation takeoff, the student assumed the lead, accomplished a low-level to the range, and made three strafe runs. Following the last pass, the IP assumed the lead, as briefed, proceeded to another tactical range a short distance away and rolled in for a firing pass. On final, the IP heard the student call "IN." After recovery, the IP attempted to pick up the student's aircraft to observe his strafe hits, however, he saw an elongated fireball similar to a napalm drop. The student pilot made no attempt to eject and was fatally injured.

An exhaustive analysis of the aircraft and engine components revealed that no materiel or maintenance factors were involved. The board determined that the accident was caused by the pilot in that, "he permitted the aircraft to collide with the ground during a low angle

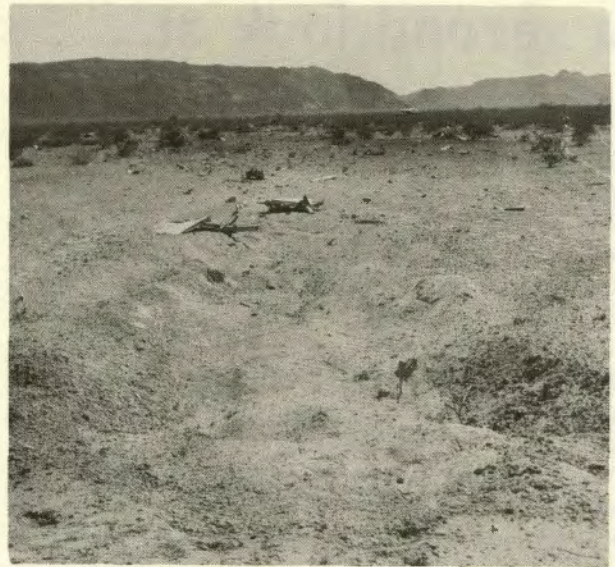
strafing pass." Flight control positions at impact were as follows: rudder and ailerons, zero deflection; stabilator deflected 15.3 degrees trailing edge up; stabilator trim set at 4.5 units nose up. The speed brakes were extended to 22 degrees, full deflection is 45 degrees. Both engines were operating at 100 percent at impact.

It was recommended that proper aircraft handling techniques, and the requirement for constant attention outside the cockpit be related to the hazards involved in low altitude, high speed maneuvering on every ground attack briefing for student pilots. To understand the rationale behind the board's recommendation we need to look at some more factors.

Recovered gun camera film revealed that the pilot fired two bursts on the pass immediately preceding the accident pass. He ceased fire at approximately 1150 feet slant range on the first burst and at approximately 550 feet on the second burst before initiating recovery. The IP briefed to fire from 2800 down to 2300 feet using low-angle strafe techniques. It should be recognized that the student successfully completed ground attack, and ground attack tactics phases of training, prior to this combat profile mission. Therefore, his training should have provided him with experience, although limited, to judge proper slant range. In addition, double bursts on one pass have never been the technique of a good fighter pilot.

Although the first three passes were recorded on the gun camera film, there was no film exposed on the accident pass. Why?? The board's conjecture is related to their recommendations. First, it is possible that the pilot turned his Guns and Camera switch to OFF following his first three passes while enroute to the second tactical range, although there was no requirement to do so. If he forgot to turn the switch back to Guns and Camera and didn't recognize it until he tried to fire on the accident pass, he may have tried to turn the switch on and salvage the pass. Secondly, he may have dropped some object in the cockpit and tried to recover it on final. It is obvious that during low altitude, high speed operations on a gunnery range it's dangerous to have your head in the cockpit. That is the reason we change and check gunnery switches at a time and place when sufficient altitude is available – student and combat-ready pilots alike. That is why phase and flight briefings, as well as phase and operational manuals consistently point out the hazards of low altitude fighter operations. In addition, all of us have been cautioned time and time again; if the pass isn't right for any reason, call off dry and make the next one count.

There is no tangible evidence to indicate the nature, position, or altitude of the maneuvers on the pilot's last pass and those just prior to the accident. A proper roll in and tracking pass should have resulted in a ten to



fifteen-degree dive angle which, if held to impact, would have placed the accident point on the far side of the target. The impact point was 1825 feet short. The near maximum nose-up stabilizer throw and high engine power settings, are evidence that the pilot recognized his situation and was attempting recovery when the crash occurred.

When you roll in from base, all your cockpit tasks should be completed. If they're not, you are not ready and should realize this fact almost instinctively. And what is a double burst worth? At a nickel a hole, with a hundred rounds per jock . . . looks as though you could lose five bucks at most.

There isn't a training target worth one of our airplanes. More importantly, and I think you will agree, none are worth your life . . . not even at a nickel a hole. ➔

a second look at....

Fiascos usually end with considerable humiliation, always marked by a bent ego, sometimes destroyed equipment, and occasionally, injury or loss of life. That a fiasco can happen on a flight line seems impossible, simply because it usually stems from, or at least shows, lack of knowledge... commonly called ignorance. But it continues to happen! Why?

An egress specialist was installing a bucket seat in the aft cockpit of an F-4. It had already been lowered into the cockpit and was resting on the floor. He stepped into the cockpit and started positioning the seat for hookup. That's when the rocket motor fired, projecting the seat and mechanic upward against the aft canopy. Glancing off the shattered canopy, which landed on the ramp aft of the Phantom, the man/seat trajectory was altered toward the open front canopy, tearing it loose from its mounts. Man and seat thudded to the ramp in front of the F-4, the seat cart-wheeling on down the concrete. Was it ignorance that caused this mechanic's death? Hardly, but it's apparent that he chose to ignore knowledge possessed.

Investigation showed the following: the rocket motor ignitor sear was missing, but the ignitor sear safety pin lay on the cockpit floor, in serviceable condition and showed no damage to indicate forcible extraction; a bent and frayed portion of the rocket motor cable was consistent with damage which would be caused if it had been incorrectly routed and caught on the sear/cable connecting link during positioning movement; the mechanic was working alone, though TOs and checklist specify a two-man operation.

Why was the safety pin not installed? Why was the rocket motor cable incorrectly routed? Why did one man try to perform a two-man job? Are answers to these questions good reasons... or excuses for ignoring correct practices?

A faulty air compressor in a C-123 right drop tank pylon had to be replaced. Three maintenance men were assigned. They found that on this particular model pylon the drop tank had to be removed to get to one of the pump mount bolts. After positioning a maintenance stand under the drop tank according to TOs, two men remained on the stand to stabilize the tank while the NCOIC entered the cockpit to actuate the jettison switch (a technique apparently often used though TOs require manual release only).

The sergeant set up switches for the electrical jettison by turning on battery power, pulling a breaker which he thought was for the right wing nacelle fuel tank, and broke the safety wire on the external drop tank jettison switch cover. He called for jettison clearance and both men on the stand replied affirmative. While watching through the right window, he reached for the drop tank jettison switch, but in fact flipped the jettison switch for the right nacelle tank. The drop tank didn't move but the nacelle tank plopped to the ramp, split open under the weight of several hundred gallons of avgas, which promptly surrounded all three men and the aircraft.

Why sparks didn't send the whole fiasco up in smoke is a tough question. But it's no tougher than, why three men chose an unauthorized technique, then compounded it by

FLIGHT LINE

FIASCO



ignorant, or at least careless switchology. But an even more vital question is, why supervisors feel free of responsibility when they willfully condone TO irregularities by simply ignoring malpractice (testimony indicated that electrical jettison was the "accepted" method even though some admitted knowledge of TO requirement for manual unhook).

Supervisory negligence is synonymous with the herder who allows his assemblage to charge out on their own regardless of known hazards; like the following. A crew chief's C-130 was spotted at the wash rack. He took three men and checked with the wash rack supervisor about scrubbing down their bird. The chief and his crew were directed to the building where they could get cleaning agent, tools, protective clothing, and safety gear.

Because the Herky had a heavy coat of grime, the crew decided to use the cleaning agent at full strength instead of the three-to-one water dilution. And probably because they were washing only one bird, they chose to work without protective gear and face shields. It didn't take long either. The chief supervised, directing one man to spray the belly while the other two split the engine areas, one on each side of the fuselage. The undiluted agent made scrubbing a breeze and the crew soon had the ship hosed down, clean as a whistle.

That afternoon, one of the crew asked the chief for time off to go to the hospital. His eyes hurt! A little later, the rest of the crew requested the same trip. Their eyes hurt too. Two were hospitalized, and the other confined to quarters, all with corneal abrasions, eyes injured by the alkaline based cleaning agent.

Investigation showed that the four-striper chief had never supervised a wash-down before. And though he admitted being told by the wash rack supervisor where to get protective gear, he said he was unaware of the hazards involved and of procedures to follow. This mediocre

excuse is compounded by the wash rack supervisor's lack of concern about inexperienced personnel using a facility involving obvious hazards. Why did this fiasco happen? Ignorance or negligence?

A gun crew went out to a fighter-bomber to perform turn-around loading of the four twenty-milimeter cannon. The team leader started atop the left wing, removing ejection chutes from outboard and inboard guns. Both cannon plugs checked disconnected (performed on landing, in dearming area) and he lowered the ammo can to his partner on the ground, then started breakdown on the left outboard gun. That's when his partner called from under the right wing for that wing's ammo can. So he crossed over, removed the ejection chutes from both right wing guns and lowered the ammo can to his partner. While on the right wing, he decided to breakdown both guns. He removed three rounds of HEI from each gun, reassembled, and connected both cannon plugs.

About to return to the left wing, he heard a call from the bomb loading crew chief who wanted to turn-on aircraft power to check the bomb racks. He answered affirmative but requested that the gun circuits be checked first as soon as he finished with the left outboard gun. It yielded the usual three rounds of HEI, was reassembled and cannon plug connected. Then he called for gun check. The left inboard gun whirred in its mount, blasting off the three rounds which had not been removed!

Two rounds ricocheted off the concrete about 35 feet ahead of the aircraft and impacted in an open area about a mile off the flight line.

The third round carved a massive hole in the chest of an avionics man passing in front of the fiascoed bird!

Investigators found that the cannon plug of the offending gun was torn from the lead. It has not been found or accounted for. Whether it disappeared after the firing or whether the rounds were fired off because of shorted leads has not been determined. But one thing sure, one gun was not cleared before initiating a functional gun check, a malpractice of basic gun crew procedure. Why did it happen? Was it ignorance? . . . or negligence?

An opening statement is worth repeating. "That a fiasco can happen on a flight line seems impossible simply because it usually stems from, or at least shows, lack of knowledge . . . commonly called ignorance." Of these four "accidents" just related, supervisors were on hand; their biggest job, simply stated, was to see that operations were correctly carried out, without ignorance or carelessness! That they ignored this responsibility smacks of negligence.

Negligence on the flight line, even at the lowest level, means trouble, but as long as it is practiced by some supervisors, we can count on continued flight line fiascos!



Thunderbirds

Major Harold A. Shelton, a former Air Force enlisted man, was granted a commission in 1955, earned a BA degree in education from Wichita State University in 1960, and accomplished graduate work in mathematics and physics at Kansas State Teachers College.

His maintenance experience includes chief of maintenance duties during two F-105 deployments to PACAF, and assignments at McConnell Air Force Base as commander of an OMS squadron, wing OC officer, wing flight test maintenance officer, and OMS maintenance supervisor for F-100s and F-105s.

Major Shelton returned from a SEA tour in August 1966 where he flew 82 F-105 missions, earning the Air Medal with five clusters and the Vietnamese Service Medal.

Before joining the Thunderbirds in December 1967, Major Shelton was Chief of the Plans and Ground Training Branch, 4900 ABG, Kirtland Air Force Base.



Precision flying of five white F-4E aircraft distinctively trimmed in red and blue of the Air Force Thunderbirds, has thrilled thousands of people since June 4th of this year.

In enthusiastically describing these aerial demonstrations, a few news reporters have incorrectly used the adjectives, "dangerous," "dare-devil," and "death-defying" in the recounting of the maneuvers. Such words may have been realistic in the days of "barnstorming" or they might be correct when used by a barker at a carnival side show. However, this kind of description certainly is not applicable to our Thunderbird flying, or any part of our operation.

Those of us in supply and maintenance who support

the air demonstrations stand proud and confident as we watch the precision and beauty of well planned, professional flying as the gleaming F-4s arc and roll past the spectators. We are proud to be representing the Air Force and helping demonstrate the capabilities of the modern jet fighter to the public. We are confident that our "magnificent flying machine," McDonnell Douglas F-4E Phantom IIs, are one of the most reliable and safe fighter aircraft in the Air Force. Great effort is made by our maintenance and supply personnel to make them that way.

Often, we are asked details of how we operate and take care of the aircraft. We are questioned particularly about

Keeping the Thunderbirds Flying

By Maj Harold A. Shelton
Materiel Officer

what we do differently. One of the things that seems to surprise some individuals is that the Thunderbirds are organized and operate under TAC Manual 65-2, as are many of the other squadrons within Tactical Air Command. The self-sufficient squadron concept of "65-2" was developed in order to have an organization ready constantly to make a tactical deployment. We are in the deployment business to present air demonstrations and the "self-sufficient" philosophy is ideally suited for us.

The crew chiefs of our red, white and blue F-4s work under the watchful eye of our Quality Control section just as in any other squadron. By very thorough post-flight and preflight inspections, and many long hours of hard

work, our average number of discrepancies on a Q.C. spot inspection has recently reduced from seven to five red diagonals. I want to point out that our aircraft do not have a radar-fire control system, nor do we have ordnance. Both of these areas are troublesome to the other F-4 folks. On the other hand, anyone familiar with the F-4 knows the sheet metal work load required after maximum performance or air combat maneuver (ACM) missions. Our aircraft are subjected to similar maneuvers repeatedly, which helps our maintenance crews earn their pay.

Our scheduling and records people have an interesting challenge in that we normally start a TDY deployment on a Friday and return eleven days later on a Monday. We stay home three days then deploy again. During a deployment we will fly an air show one day and move to a new show site the next day. And usually on a week-end we will move in the morning and fly a demonstration during the afternoon! That means each aircraft is scheduled to fly one to two flights per day, every day for eleven days. That's followed by three days down for maintenance — if a practice mission is not required while we are at home. This down time at home is taken up by Q.C. spot inspections, cleaning, corrosion control and painting, time change, minor TCTO compliances, some phase inspections, and routine maintenance. We accomplish our running phase inspections after an air show while on a deployment and also do any required maintenance to provide OR aircraft ready to move the next day. You can probably begin to see that if our maintenance men want to spend any time with their families when they get back to our home base they must repair all discrepancies as they occur while on a deployment, or else they will have to work day and night at home to get ready to deploy again.

In order to make on-the-spot repairs our supply section (MSU) has developed an elaborate mobility spares kit (MSK) of reparable items and have also provided a mobile bench stock. All of this is carried from one show site to another by a C-130 that TAC assigns to use for each deployment. The Herky-bird provides transportation for our ground crews, equipment, and spare parts. We tip our hats to the really fine TAC C-130 crews that continually give us outstanding support.

This is a pretty demanding maintenance schedule I have described when you consider all of the travel time that is required by the technicians in order to keep up with their aircraft. Also, that this schedule runs continuously from the first of March to mid-December each year. The important factor that makes our tight schedule possible is that the TAC Operations Staff is aware of the demands, and has followed a wise policy to guarantee that Thunderbird aircraft are maintained in the

Keeping the Thunderbirds Flying

best possible condition. Our present show requires a deployment of seven aircraft and TAC has provided us with eight F-4s. This enables us to schedule an aircraft to remain at home base for major maintenance, engine change, and major TCTO compliance.

There are two programs that we participate in actively in the interest of safety. Flight data recorders are installed in each of our aircraft. The recorders do pile an additional work load on our crew chiefs and our instrument shop. But, they provide information on speed, altitude, and Gs imposed on the aircraft, which is used in the structural reliability program for the F-4 fleet. Also, within our own squadron we monitor our engine oil analysis (SOAP) very closely. Our engine technicians maintain records of oil sample read-outs for each of our engines. These records are taken with us on the deployment. An effort is made to get our samples read at a nearby SOAP lab during the deployment. If a laboratory is not readily available, the samples are air mailed back to the lab at Nellis AFB. The oil analysis program has saved us from one internal engine failure so far in the F-4.

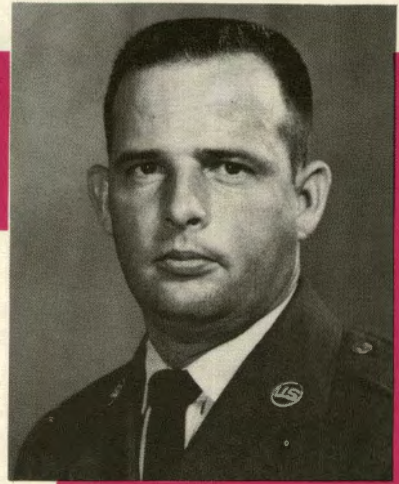
It would be interesting to talk about the procedures the Thunderbirds do differently in their demonstration mission. But, the really important principles that enable us to continue to meet our tight schedule are: (1) we maintain high standards for all work that is accomplished; (2) we do not take short-cuts! For example, our standards are such that the throttles to those responsive J-79 engines are aligned to match exactly, even though the TO allows up to one quarter inch out-of-alignment for like power settings. Several of the aircraft had ailerons drooping within TO tolerances when we received them. The flight controls were carefully rigged to the nominal dimensions by our flight control team, following the TO step by step.

We have problems, as does any other maintenance organization. However, we do not just live with a problem, we do every thing possible to solve it. Our answer to performance reliability and safety is high original standards with continual improvement where possible. The maintenance and supply team is proud and inspired by the Thunderbirds' tradition. That's why every man that joins the team tries to leave his area better than he found it! ➤



Tactical Air Command Crew Chief of the Month

Staff Sergeant Robert J. Blanchard of the 4441 Combat Crew Training Squadron, Williams Air Force Base, Arizona, has been selected to receive the TAC Crew Chief Safety Award. Sergeant Blanchard will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



SSgt Blanchard

Tactical Air Command Maintenance Man of the Month

Staff Sergeant Willie A. Mayne of the 4407 Combat Crew Training Squadron, Hurlburt Field, Florida, has been selected to receive the TAC Maintenance Man Safety Award. Sergeant Mayne will receive a letter of appreciation from the Commander of Tactical Air Command and an engraved award.



SSgt Mayne

what is a TAILGATER?



Somewhere between the fume-spouting exhaust pipe of the tractor-trailer and the dainty white puff from the little bug, we find a delightful creature known as the "tailgater."

Tailgaters come in assorted sizes and shapes . . . mostly repulsive. You find them everywhere . . . but mostly two feet from your rear bumper. Undertakers love them, the driver in front hates them, policemen tolerate them, empty highways frustrate them, nobody can ignore them, and who knows who protects them.

A tailgater is ignorance with a weapon at his command . . . death with a gleam in its eye . . . stupidity with the power to kill . . . and irresponsibility with a driver's license.

A tailgater has the appetite of Dracula, the energy of a 400-horse power engine, the curiosity of an inspector of rear bumpers, the lungs of a stuck automobile horn, the enthusiasm of a horseman chasing Lady Godiva, and the shyness of a fullback three yards from the goal line.

No one else is so familiar with the hospital emergency

room or so at home in traffic court. When you're stranded on an empty highway, he roars past with a wave. When you don't want him, he's grinning at you in your rearview mirror.

A tailgater is a fabulous creature. You can keep him out of your back seat, but you can't keep him out of the wreckage of your trunk. You can charge him higher insurance premiums, but you can't charge him with the murder of his victims. You can suspend his license, but you can't suspend his driving.

He's your terror, your shadow, the cause of your cursing, and your constant companion on the road. But when he finally turns off at a tavern, he's a soothing vacant space behind your car, a toothache that's stopped hurting, a feeling of safety in the world.

And when he breaks your neck in a rear-end collision and comes to visit you while you're in traction, he can bring tears to your eyes with those apologetic words: "I don't have any insurance, you know." ➔

Adapted from National Safety Council Newsletter

TAC TALLY

AIRCRAFT ACCIDENT RATES

* Estimated

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1969	1968	1969	1968	1969	1968
JAN	6.8	5.6	28.9	0	0	0
FEB	6.2	7.3	12.8	0	0	0
MAR	6.8	7.1	12.6	0	0	0
APR	7.4	8.7	15.1	1.9	0	0
MAY	7.5	8.0	12.9	7.5	0	0
JUN	7.2	8.5	12.6	7.4	0	0
JUL	7.4	9.3	11.3	6.3	0	0
AUG	7.3	9.4	11.5	8.2	0	2.3
SEP*	7.0	9.1	10.7	7.4	0	2.0
OCT		9.3		6.7		1.8
NOV		8.6		6.9		1.7
DEC		8.8		7.8		3.2

UNITS

THRU SEP	1969 *	1968	THRU SEP	1969 *	1968
9 AF	2.9	5.8	12 AF	9.6	9.3
4 TFW	4.8	10.1	23 TFW	11.1	21.0
15 TFW	2.5	10.5	27 TFW	4.1	9.0
33 TFW	15.9	8.9	49 TFW	6.5	0
4531 TFW	4.3	12.4	479 TFW	10.9	9.3
			474 TFW	17.5	39.4
363 TRW	7.8	3.3	67 TRW	0	11.8
			75 TRW	4.8	0
64 TAW	0	0	313 TAW	0	0
316 TAW	0	0	516 TAW	5.1	0
317 TAW	0	0			
464 TAW	0	0			
4442 CCTW	0	0	4453 CCTW	8.9	12.7
4554 CCTW	0	N/A	4510 CCTW	14.2	6.0
TAC SPECIAL UNITS					
1 SOW	4.7	17.8	4440 ADG	0	0
4409 SUP SQ	0	0	4500 ABW	5.1	0
4410 CCTW		7.4	4525 FWW	16.4	34.2
4416 TSQ	0	50.7			

Our Regular and Reserve combined accident toll for September dropped to four. In numbers, the best month since February. Unfortunately, the bulk of our four accidents did not need to happen, only one could be considered "almost inevitable." Fighters led the pack again, accounting for three of the total. The other involved a helicopter. Fortunately, pilot fatalities dropped to two, the lowest since July. With a total of 62 accidents at the three-quarter mark, we're doing only slightly better than last year, averaging almost seven major accidents per month. Pilot fatalities have increased to a tad over three per month.

We recorded our fourth F-4 fire major accident during this period. The lead of a flight of four engaged in ACM got a left engine fire light. He shut it down, but it kept burning. Three and Four confirmed smoke from the left engine AB nozzle area followed by flames in the left wing root in the vicinity of the gear well.

Another F-4 accident occurred when cockpit fog on takeoff caused the pilot to run off the runway; the crew escaped but the aircraft was destroyed. An F-84 suffered a

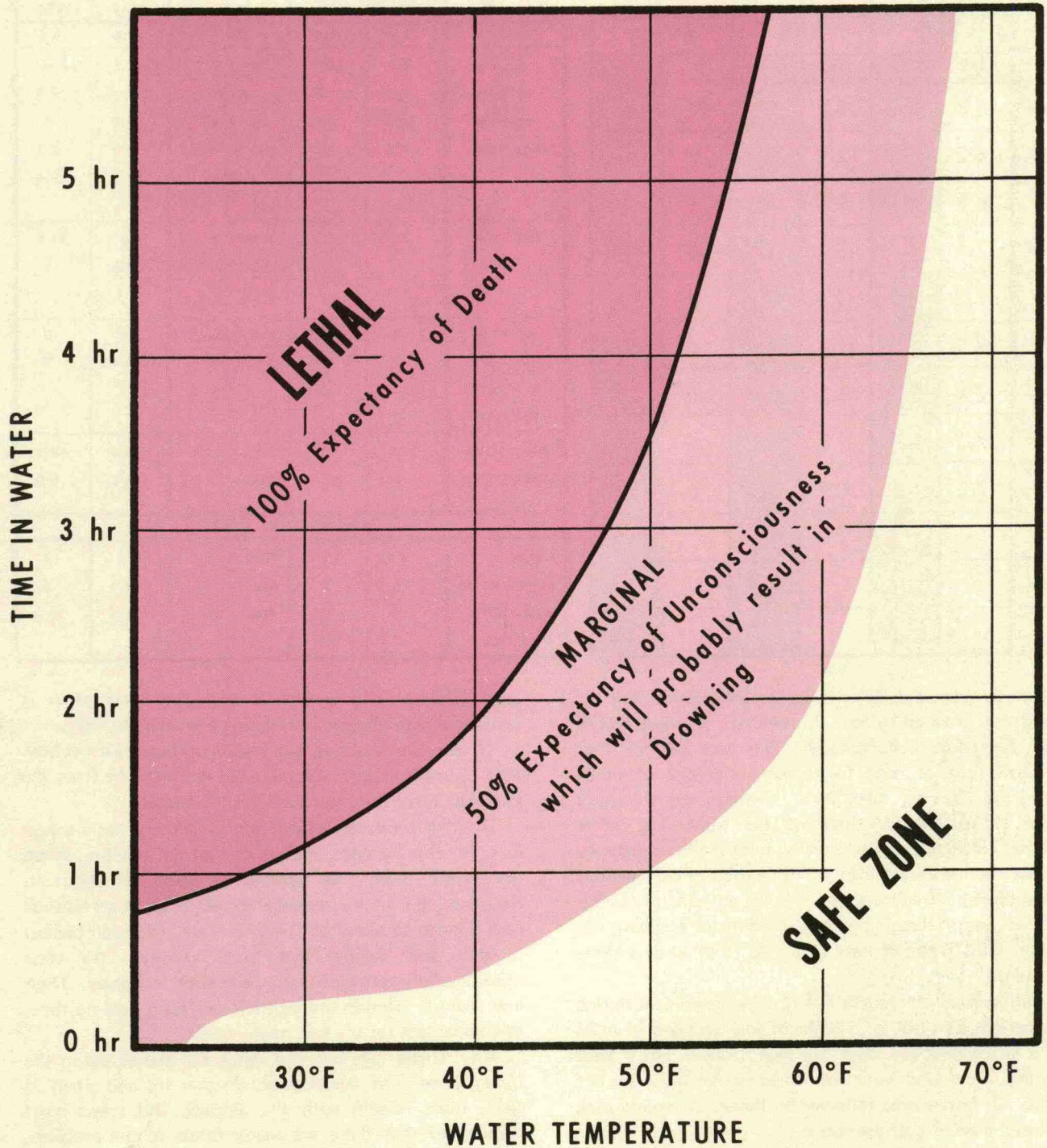
hard landing, and a UH-1P was destroyed when it contacted high tension lines during low altitude flight.

Of our two fatalities, one was an unsuccessful ejection. Due to malfunction, the pilot did not separate from the seat. The other pilot went in with the aircraft.

Another unsuccessful ejection in October has a lesson in it. In this instance, the pilot's seat did not fire. When discovered, there was nothing he could do about it. However, the original emergency occurred at an altitude high enough to allow an "over the side" (manual) bailout if this seat failure had been known. This crew unsuccessfully attempted to dead-stick a fighter. Their low altitude ejection attempt left no room, and no time, to compensate for the seat malfunction.

Any Turtle can tell you what the stakes are in the flying game. The decision of whether to, and when to eject, must remain with the aircrew. But crews must understand that there are many facets to the problem, some uncontrollable in flight. You should always stack the odds on your side — and that means a lot of thinking and research on the ground. Serious thinking!

TIME OF LIFE EXPECTANCY IN WATER WITHOUT ANTI-EXPOSURE SUIT



Courtesy U. S. Naval Safety Center