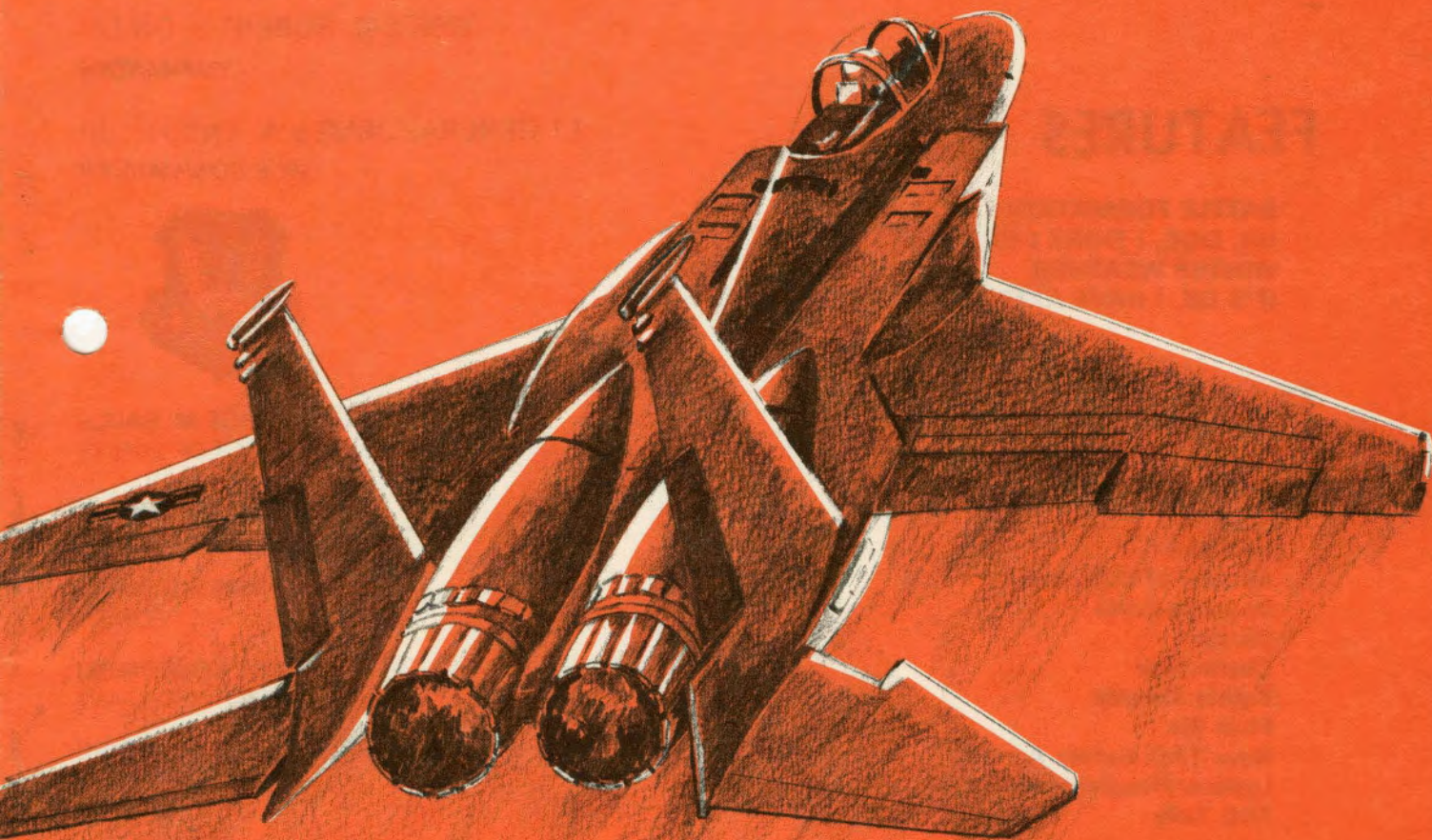


TAC ATTACK

TAC Attack

OCTOBER 1977

October 1977

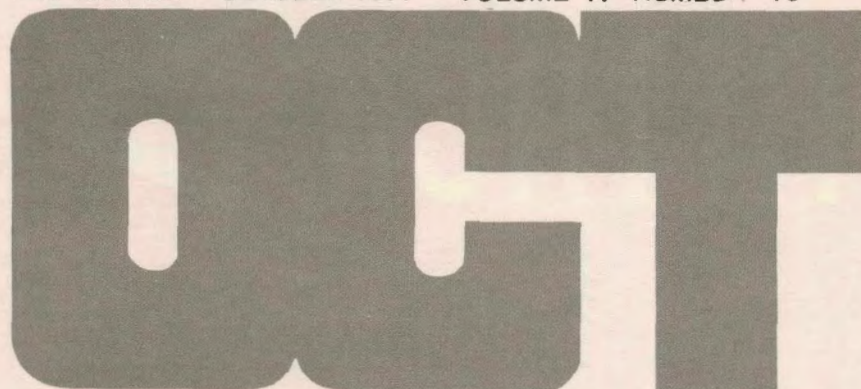


Battle Formation, pg 4

BATTLE FORMATION

....Pg 4

ARRISON



FOR EFFICIENT TACTICAL AIR POWER



TACTICAL AIR COMMAND

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COMMANDER

LT GENERAL JAMES A. KNIGHT, JR.
VICE COMMANDER



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TACRP 127-1

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SUPERVISION AND SOUND JUDGEMENT

We are now well into the task of modernizing the tactical air forces. The face of TAC will continue to change into the 1980s with the emergence of new weapons and weapons systems. Along with equipping our units with new aircraft, we must also train our aircrews and maintenance personnel how to operate and maintain the new systems. We are maintaining most of our combat capability with the old weapons systems while achieving it in the new.

The turbulence created by the modernization process is producing many problems which must be overcome. Experience in the new systems is low for both operator and maintainer, and the "corporate memory" on which we have so often relied for answers is still being accumulated. New tactics to ensure the systems' optimum employment have been and must continue to be developed and tested. We must be able to recognize when we are overcommitted or

Angle of ATTACK

overextended and take the proper precautions to minimize the risk. Our training programs must be designed to enhance mission accomplishment -- at the same time, they must fit the needs of our operational and maintenance personnel. How well we overcome these and other problems will determine the success of our modernization. We are making too many errors now and we must do better.

The key to the problem is impeccable supervision at all levels -- and the fundamental element in sound supervision is good judgement. But to properly supervise, you must know your people -- their strengths, capabilities, mental and physical condition, and especially their weaknesses. If you know your people, you will be able to recognize those personnel indicators which will tell you who needs more training, who is ready for what mission, and who needs closer supervision.

We can accomplish the modernization of TAC effectively. It will not be an easy task -- but a tough, demanding challenge which everyone must accept and meet if we are to sustain our combat readiness and improve our combat capability. A lot of Americans are betting on us and the payoff will be worth our effort.

George M. Sauls
GEORGE M. SAULS, Colonel, USAF
Chief of Safety



**By Col Jack O'Donnell
Cmdr, Tac Tng, Luke
Luke AFB, AZ**

The question of collision avoidance in this age of increasingly dense air traffic situations has cropped up frequently in the fighter community, and a number of possible solutions have been explored. Among these solutions is one

presently in use at Luke Air Force Base, referred to officially as "Battle Formation" and unofficially as "Fred Spread" (in honor of my predecessor). The progression of this formation from an abstract concept to a daily routine was due largely to the efforts and inspiration of Major General Fred Haeffner (former Commander, Tactical Training, Luke), Major Mar

BATTLE FORMATION

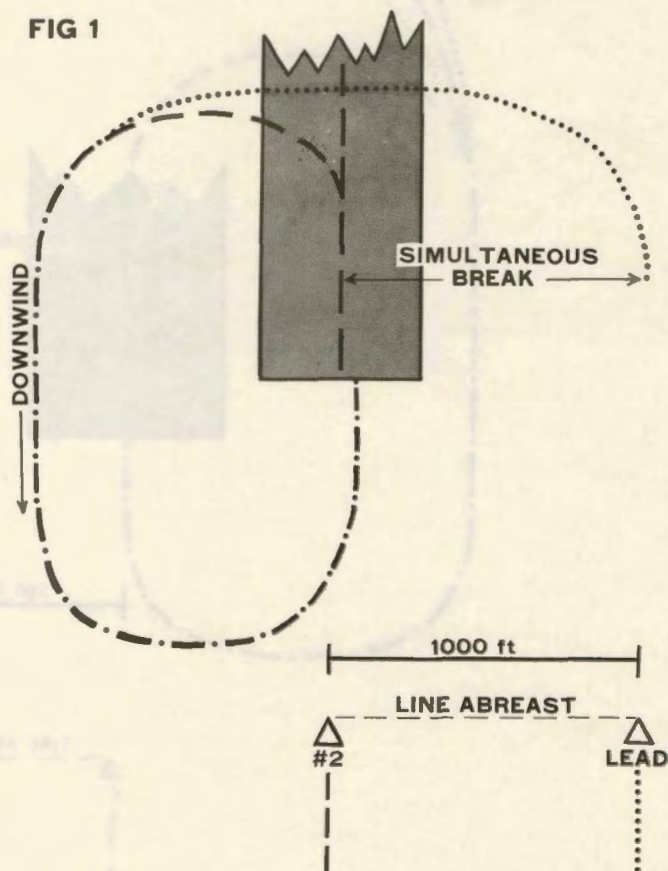
one answer to see
and be seen

Noel (former CinC, F-104 AWIC), and all the dedicated flight leads who have proven the value of spread formation.

The premise on which Battle Formation is founded is simple -- depart from the traditional "light on the star" formation in and around the traffic pattern, and allow the wingmen to augment the lookout capability of the flight lead and thereby enhance "bogey" detection. Although presently employed primarily for collision avoidance, we feel it also has sound tactical application. Many of us have seen gun camera film of kills in the traffic pattern (even with gear and flaps down); and when we project ourselves into the areas of possible future conflict, I can envision the same situation recurring, only this time with F-4s or F-15s in the sight reticle of some MIG. The Battle Formation can help eliminate this possibility through improved lookout, maneuverability, and reaction capability.

What is this magic formation? In Figure 1, you will see that there really is nothing especially exotic about it. In fact, the whole approach is quite basic. We simply space the wingman out far enough to relieve him of his close formation responsibilities and replace him with a "keep your eyes open" responsibility. This also includes the use of your aircraft systems like

FIG 1



battle formation

supersearch for the F-15. Through employment of tactical lookout techniques and the spread formation, not only can flight members contribute to the detection of potential threats, but the formation is also more easily seen by other flights in the traffic pattern so that they can also take proper avoidance action.

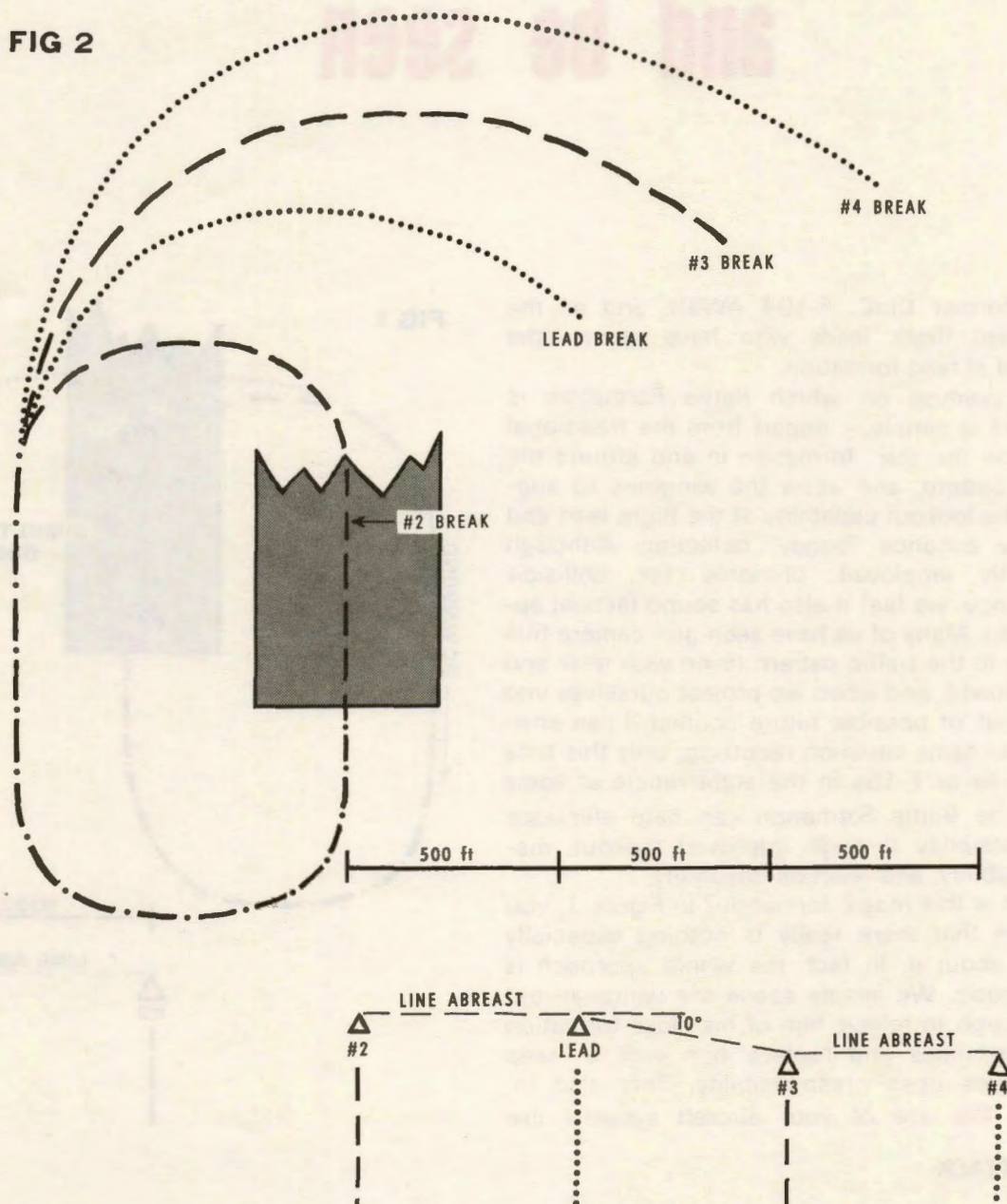
The formation has some variations, primarily in the number of aircraft in the formation. A two-ship flight can enter traffic and proceed as shown in Figure 1; formations with more than

two aircraft proceed as shown in Figure 2. Line abreast spacing, although not critical, is manageable between 500 and 1,000 feet. The position of the wingman is also relatively non-critical as long as the flight lead properly briefs his flight on their positions and responsibilities.

There are several questions raised in discussion of the Battle Formation. Among them are:

1. Doesn't the width of the formation cause some problems?
2. How about noise problems in the areas surrounding the base?
3. How do you maintain required spacing in the landing phase of the approach?

FIG 2



4. Assuming a tactical environment, do we really have sufficient maneuvering airspeed to defeat a possible attack in the pattern? In answering these questions, we can combine questions 1 and 2 and then separately address the others.

Our experience at Luke has not shown the width to be a problem, nor does it create severe noise problems in the areas surrounding the base. The width of the formation is one of its attributes, in that it provides enhanced lookout capability as well as greater target visibility to other traffic. At bases where noise could become a problem, it should be remembered that the spacing need not be 1,000 feet but can be collapsed to 500 feet without seriously degrading the stated advantages.

Spacing around the pattern is always a matter of concern to flight leads interested in bringing home a good looking flight. In a two-ship flight, spacing is the least critical, and both flight members can break simultaneously. The problem becomes more complex with the addition of more aircraft. In flights of three or four, we have found that 2 to 3 seconds is optimum with each pilot flying his airplane to the desired downwind position. The order of break must be briefed. Generally, two options are available: a. Lead echelons his flight away from the break and breaks first over the numbers -- no problem -- we do that all the time. b. The flight enters in battle formation with number two on the break side. Again, no problem. On the briefed signal -- wing flash or radio call -- number two breaks, followed by the remainder of the flight, each of whom flies his airplane to the proper downwind position.

The last of the questions becomes more interesting -- do we really have required maneuverability for the tactical environment? At Luke, due to our varied types of aircraft, we fly initial at 325 knots. This airspeed provides some additional maneuverability, and we feel it would be desirable in the tactical situation. Other bases could do likewise. Additionally, most of our tactical ranges have one or more runways where the tactical break could be practiced during range missions. To enhance the realism of the situation, identified aggressor aircraft could be used to "attack" flights on the tactical range providing added impetus to the flight formation lookout while they practice the tactical pattern entry. Hassles need not, and should not, develop

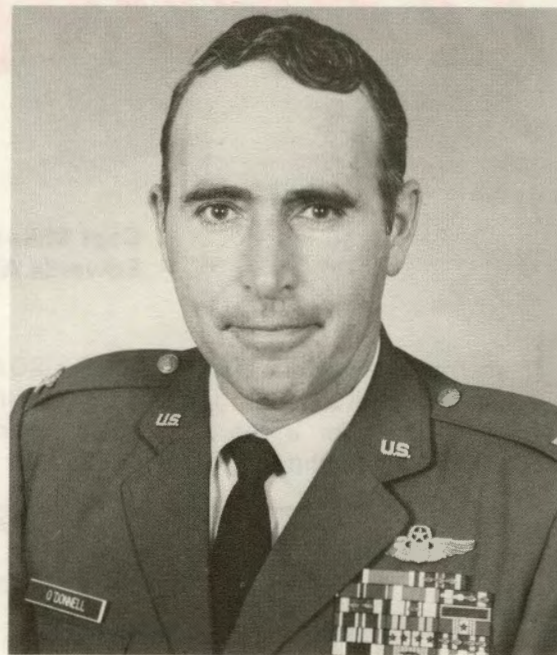


Col John F. O'Donnell
is this month's
Fleagle T-shirt winner

since the lookout training objectives have been met if the aggressor closes to his weapons envelope or is called out prior to reaching his ordnance delivery parameters.

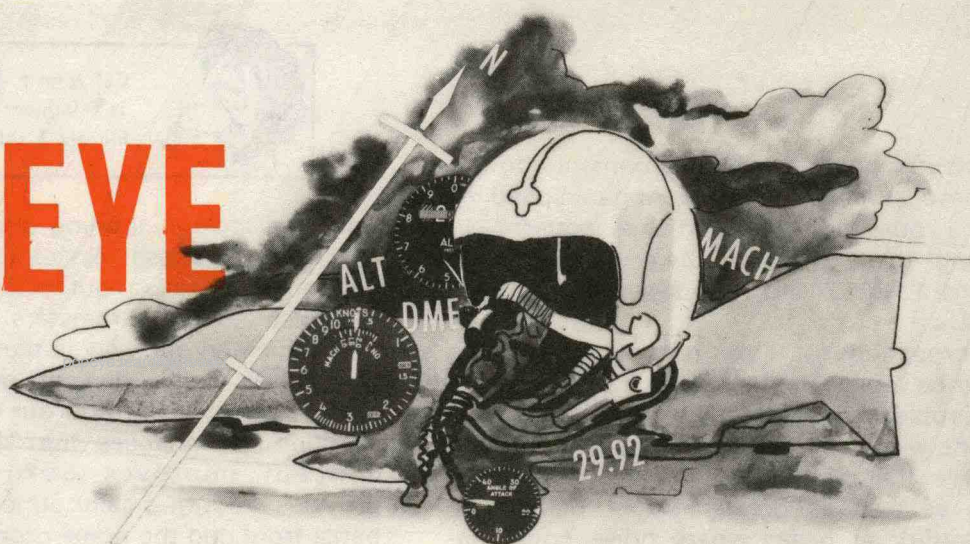
In summary, our view is that the Battle Formation offers some distinct advantages in the tactical environment and our crowded air traffic situation. It enhances the "see and be seen" concept, improves lookout training, and provides us with a safer atmosphere around the battle front and the home dome.

Check six. ➔



Colonel John F. O'Donnell (B.S. Newark College of Engineering) is Commander, HQ Tactical Training, Luke Air Force Base, Arizona. His former assignments include Commander, Vice Commander, Deputy Commander for Operations and Director of Operations (F-4/F-15), 58 TTW, Luke AFB; Assistant Deputy Commander for Operations, 432 TRW, Udorn RTAFB; F-4 Project Officer, Fighter Requirements Division, DCS R&D, HQ USAF; Fighter Test Operations, Eglin AFB, FL; Minuteman Development Program, AFSC Los Angeles, CA; and Air Training Officer, USAFA. Colonel O'Donnell is a command pilot with over 4,800 hours in five different fighter aircraft and over 200 combat missions (F-105/F-4). His decorations include the Legion of Merit, the Distinguished Flying Cross with Three Oak Leaf Clusters, the Bronze Star, the Meritorious Service Medal, the Air Medal with 15 Oak Leaf Clusters and the Air Force Commendation Medal with One Oak Leaf Cluster.

POPEYE

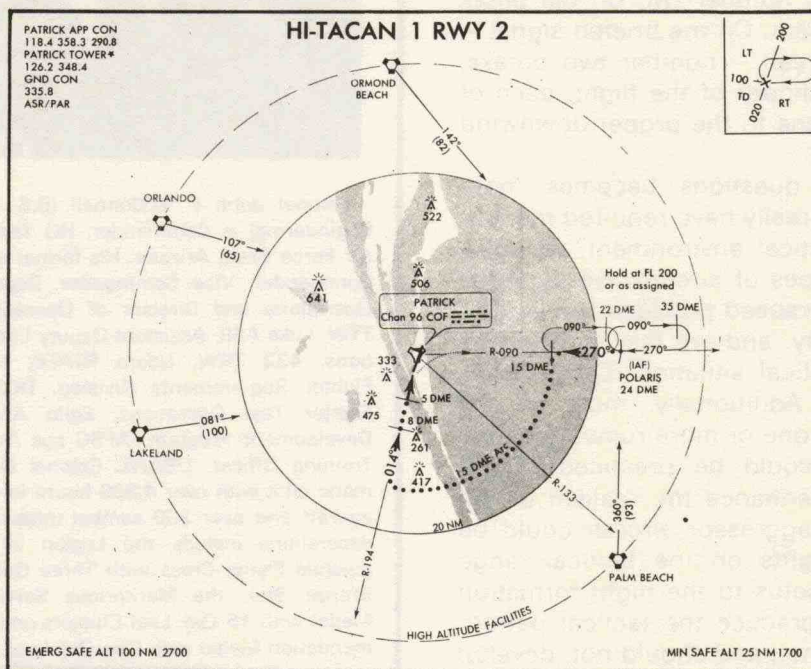


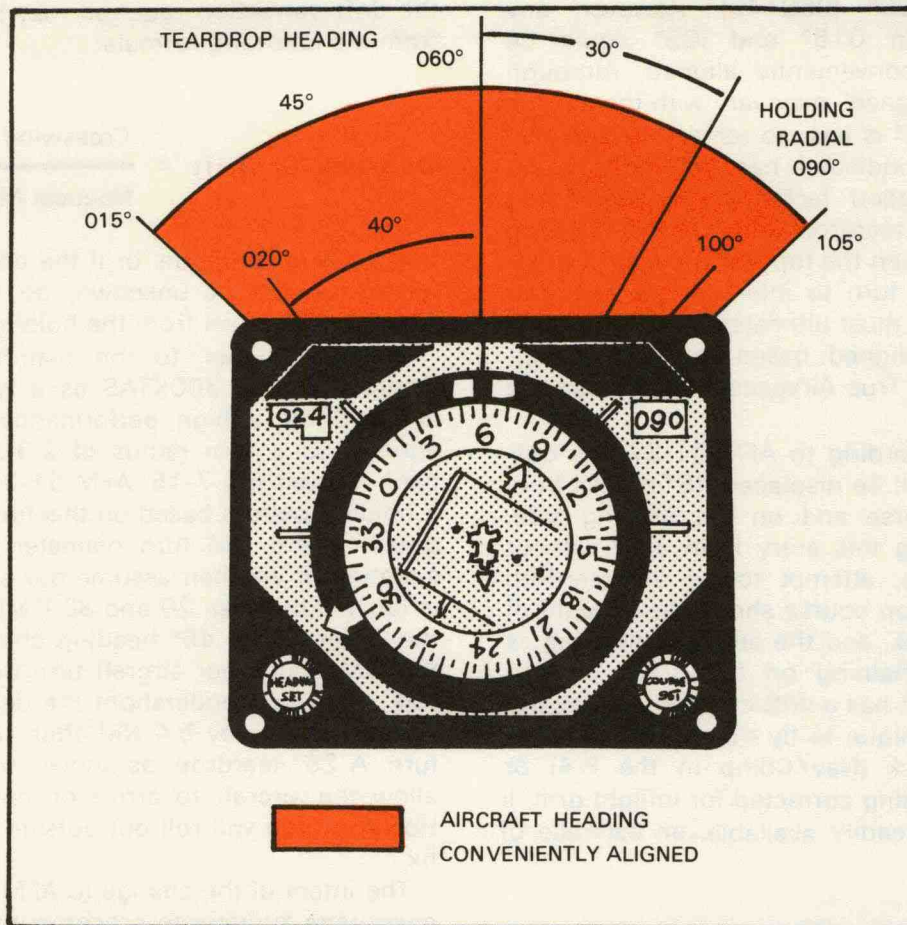
TEARDROP TEASER

Capt Mike Kostelnik
Edwards AFB, CA

1. If you're approaching Polaris (COF 090/24), and the aircraft's heading is 060°, you will be required to make a teardrop entry when cleared for TACAN holding. TRUE or FALSE?

2. The aircraft will not be considered conveniently aligned for a teardrop entry unless the aircraft heading is within the TD sector (020° - 100°) depicted for the Hi-TACAN approach to Runway 20 at Patrick AFB. TRUE or FALSE?





Teardrop Entry on the Horizontal Situation Indicator

3. When performing a teardrop entry from a fix without positive course guidance (DME Fix, etc), you should attempt to fly the teardrop track. TRUE or FALSE?

4. If a teardrop entry is executed by a high-performance aircraft (F-4, F-105, etc) so that the aircraft is offset the maximum of 45° from the holding radial, it will normally be possible to roll out on the holding course in a no-winc situation, using 30° of bank. TRUE or FALSE?

LET'S REVIEW THE "BOOK" ANSWERS

1. FALSE. According to AFM 51-37, even though the aircraft heading is within the depicted teardrop (TD) criteria, the teardrop entry is not required. The teardrop entry may be used at the pilot's discretion when entering the holding pattern from a heading conveniently aligned with the teardrop course. The decision to execute a teardrop must be considered an

optional technique rather than a mandatory procedure. It is important to note, however, that once the decision to fly a teardrop entry has been made, the maneuver itself is procedural in nature, and must be flown in accordance with the procedures in AFM 51-37. Regardless of approach heading, if the teardrop entry is not performed, simply comply with the normal entry procedures for determining the direction of turn (70° rule), and turn to parallel the holding course.

2. FALSE. Although not directive in nature, holding pattern entry diagrams are depicted on high altitude approach procedure charts. These diagrams are provided only as an inflight convenience for the pilot and provide entry guidance based on the procedures contained in AFM 51-37. The published TD sector includes 40° either side of a 30° teardrop course. In the example at Patrick, the 30° teardrop course is 060°, and the teardrop sector is shown as 020°

teardrop teaser

(060-40) to 100° (060+40). However, any heading between 015° and 105° could be considered as conveniently aligned. Although "conveniently aligned" may vary with the aircraft and situation, 45° is easy to remember and use. If your heading indicator has 45° indexes, the following is a good technique to use if you choose to fly a teardrop entry. If the teardrop course lies between the top 45° indexes at holding fix passage, turn to intercept the teardrop course. The pilot must ultimately determine what is conveniently aligned, based on the actual approach heading, True Airspeed, and the existing wind conditions.

3. TRUE. According to AFM 51-37, the outbound course will be displaced 45° or less from the holding course and on the holding side. When performing this entry from a fix without course guidance, attempt to fly the teardrop track. The teardrop course should be thought of as a ground track, and the aircraft's heading as a means of remaining on that track. If your particular aircraft has a drift computer on board, it's a good technique to fly the teardrop course using Mag Track (Nav/Comp in the F-4) or simply fly a heading corrected for inflight drift. If the drift is not readily available, an estimate of

the drift correction required may be determined from the following formula:

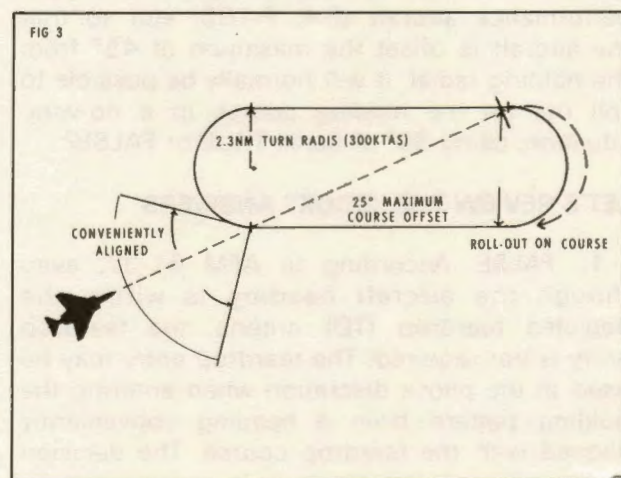
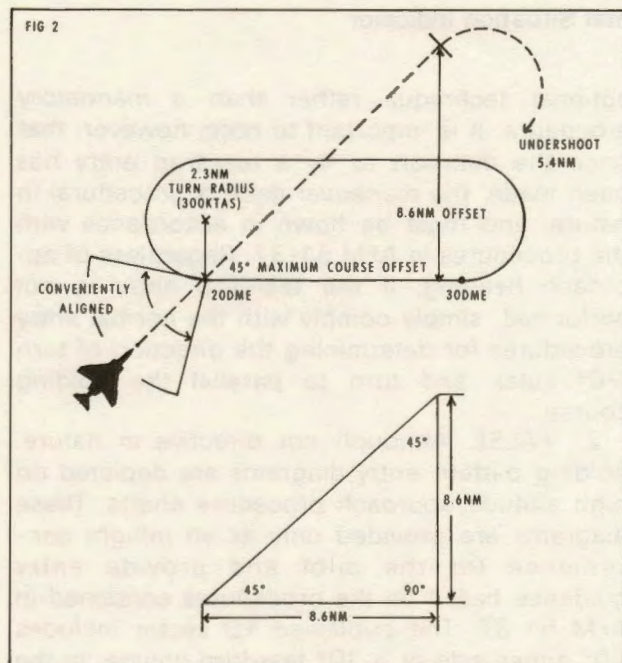
$$\text{Degrees of Drift} = \frac{\text{Crosswind Component}}{\text{Nautical Miles Per Minute}}$$

In a no-wind situation, or if the effect of wind is either variable or unknown, do not exceed a heading 45° offset from the holding course.

4. FALSE. Refer to the diagram shown in Figure 2. Using 300KTAS as a typical holding airspeed for a high performance aircraft, this equates to a turn radius of 2.3 NM if 30° of bank is used (pg 7-15, AFM 51-37). If we draw a holding pattern based on this turn radius, we'll obtain a 4.6 NM turn diameter in a no-wind situation. If we then assume our sample pattern is located between 20 and 30 DME, we find that the offset with a 45° heading change would be 8.6 NM. Since our aircraft turn diameter is 4.6 NM, we would undershoot the desired inbound holding course by 5.4 NM after 180 degrees of turn. A 25° teardrop, as shown in Figure 3, will allow the aircraft to arrive on course inbound. However, you will roll out outside of the 30 NM fix.

The intent of the change to AFM 51-37 was to encourage aircrews to precompute teardrop offsets for their particular aircraft operations. The 45° offset should allow you enough flexibility for almost any TAS/wind situation, while assuring the aircraft will not exceed holding airspace.

Turn "Teasers" into "Techniques" by reviewing the instrument procedures in AFM 51-37



UH, DOC, I THINK I GOT A DOSE OF...

By Maj Ken Krause
HQ TAC/SEP



"Gethomeitis." What? Not that tired old subject again. Well, it keeps popping up, so let's try to take a fresh look at it. Have you ever told your kid, "don't catch a cold"? Probably not. So why do we keep telling our people, "don't catch a dose of gethomeitis"? If you're afraid the kids

will catch colds, you tell them to bundle up, pull their hat down over their ears, drink orange juice, etc. You also try to keep them in on days of inclement weather and don't make them walk when transportation is available. Yet, supervisors seldom give their subordinates such thorough and sound advice when it comes to preventing gethomeitis.

Case Study: Jerry Jock packs to leave on the only cross country he'll get this quarter. ETA at home plate is Sunday noon and Jerry, Jr., has a birthday party planned for Sunday PM. Janet, wife of former, has loaded the movie camera with film and harped at Jerry all week to be sure to get home and perform his fatherly chores as producer/director at Jr.'s party. As he drags his doppel kit out the door, Janet queries (with a tone indicating she has just discovered a universal truth), "You really like to go cross country, don't you?" (Fade out.)

(Fade in.) Jerry is sitting in a hot-to-the-touch cockpit, number two, for takeoff on his home-ward leg. The time is 1000 hours Sunday. Flicker. Oh foey! Bus tie out. Now number one for takeoff. Checklist. Reset. Still on, damn. Cleared for takeoff. "Standby, tower."

Will he go or not? This is payoff time. For Jerry? No. For his supervisors? Yes.

Do the wing and squadron commanders have a firm and articulate policy regarding flying sick jets? Has Jerry been fully briefed on that policy? Is there a stigma in the wing/squadron on folks who refuse to fly birds with "nitpick" deficiencies? Or those who don't get cross-country birds back in time to make the Monday go? Has Jerry's time/sortie count been allowed to lag so far behind that he and others feel he must press for every sortie? Are Jerry's supervisors aware of his Sunday commitments? His harpy wife? Can other arrangements be made? Has Jerry's training been thorough enough so he is fully aware of the implications of his malfunction? In other words, has Jerry been sent a "bundle up" message by his supervisors or have they let it go with a warning not to catch a cold?

Whether it's Jerry Jock out on a cross country or an Airperson Basic out on a 3-day pass, we are all subject to this same social disease--get-homeitis. And it's the total picture of what the person has been taught and attitudes formed about his desired task performance that will dictate whether or not he will behave in a manner which will get him home without catching a cold.

TAC

TAC TIPS

"There is always someone worse off than yourself."

Aesop

BROKEN HABIT PATTERNS

During the takeoff roll, at approximately 120 knots, the Phantom's right main tire blew. The pilot aborted and prepared to engage the departure-end cable. Unfortunately, it just wasn't the pilot's day, and the wheel/brake assembly cut the barrier cable. Friction from the wheel/brake assembly sliding across the runway caused a fire in the right main wheel assembly. The aircraft finally came to rest in the overrun, and the aircrew performed an emergency ground egress.

The tire was a retread and appeared normal in all respects to the maintenance personnel and the pilot. Because this was only the second flight since the tire was installed, and because the aircraft had taxied only a short distance, it was determined that a tire tread separation occurred.

Why didn't the aircrew recognize a blown tire during the takeoff roll and, since the aircraft was over 100 knots, continue the takeoff as per the Dash One? Recognition of a blown tire at fairly high airspeeds is difficult. There isn't always a loud noise or thump; like when the Sim instructor bangs on the side of the trainer, and directional control problems are usually minimal. The strong cues available at low speed aren't always there in the higher speed regimes. This produces a false conditioning in the aircrew which hinders the prompt recognition of the

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

emergency. Because the Dash One doesn't discuss the recognition problem, the aircrews find out about it at the wrong time -- when it happens to them.

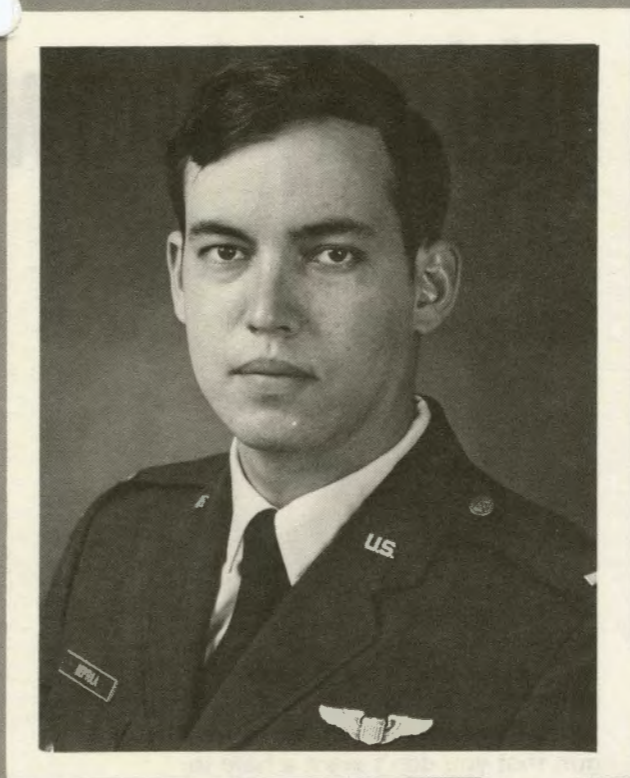
Another problem came up during the front seater's emergency ground egress. After completing the abort procedure, the front seater interrupted the egress sequence to shut down the engines because of the fire. When he stood up in the cockpit, he found his leg garters still connected. Although he doesn't remember doing so, the pilot stated he must have disconnected the lap belt manually. This is a good example of what can happen when a habit pattern is broken during a compound emergency.

When you have an emergency, don't rush. If it's a compound emergency, take it one step at a time and complete one procedure before moving on to the next. It'll save you time in the long run.

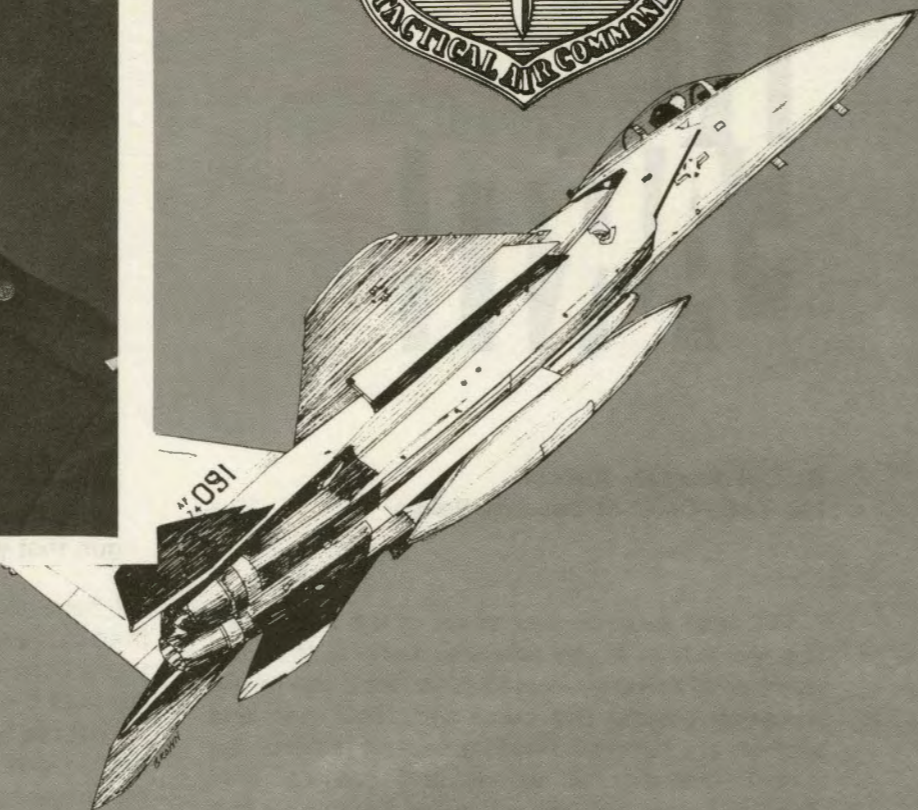
The winner of our August "Place the Face" contest was Chief Master Sergeant James C. Binnicker, Senior Enlisted Advisor, Headquarters Twelfth Air Force, Bergstrom Air Force Base, Texas. Chief Binnicker correctly identified the mystery personality as Major General Len C. Russell, former Chief of Staff, Tactical Air Command and presently Deputy Chief of Staff, Plans, United States Air Forces, Europe.

Chief Binnicker received the coveted Fleagle Fanny Feather of Fate Award for his correct response.

AIRCREW of DISTINCTION



1st Lt David A. Deptula
555 TFTS/58 TTW
Luke AFB, AZ



On 29 June 1977, Lieutenant Deptula was number two in a flight of two F-15s flying a syllabus training mission. Lt Deptula had 18 hours in the F-15 and was just completing the conversion phase of training.

Three minutes after takeoff, climbing through 6,000 feet MSL, Lt Deptula heard a bang, followed by the illumination of the left engine fire light. He simultaneously initiated the emergency procedure, including engine shutdown and fire extinguisher discharge, and called for the flight lead to join up. The flight lead visually confirmed the aircraft was still on fire and appeared to have some damage to the left aft section. Lt Deptula turned towards Luke AFB and began to dump fuel over sparsely populated desert to reduce weight. He made a controllability check to determine if the aircraft could be landed, and requested a landing on a runway with a relatively

clear approach to avoid any danger to personnel and keep property damage to a minimum in the event an immediate ejection was necessary. Eight miles on final, the right engine fire light and the left bleed air light illuminated simultaneously, further complicating the situation. Lt Deptula now had two options: eject; or continue the approach. He elected a single-engine, straight-in approach which was flown to a successful landing. The quick response from crash recovery personnel prevented further fire damage by rapidly extinguishing a residual fuel fire as Lt Deptula egressed from the aircraft.

The superior airmanship, prompt reaction to a grave inflight emergency, and professional competence demonstrated by First Lieutenant Deptula resulted in the saving of a valuable tactical fighter, and averted possible injury or loss of life. His actions qualify him as the Tactical Air Command Aircrew of Distinction.

DOWN TO EARTH

Down to Earth "I didn't know"

"I didn't know"

By Col Jerry M. Bullock
HQ TAC/Chief of Security Police

TAC land extends over some of the best hunting grounds in North America. Judging from the number of privately owned weapons I see in our armories around the command, TAC men and women are hunters. Hunting season is here. But before thoughts of woods and prairies, wild duck and deer get you too excited, consider this -- there is a good chance that a TAC hunter will become a victim of a hunting accident before the year is out.

Start → Firearms safety is loaded (no pun intended) with cliches. You know the ones, "The unloaded gun always kills," or "I didn't know the gun was loaded." The truth of the matter is that a gun is a mechanical object designed to do certain functions. If a round is in the chamber, if the sear release mechanism is released, and the firing pin strikes the primer -- guess what? It will go off, and whatever is in front of the barrel will have a hole in it.

FIREARMS SAFETY is equally simple:

- a. Don't put a round in the chamber until you are ready to shoot.
- b. Don't release the sear mechanism until you are ready to shoot.

c. Keep the firing pin from striking the primer.

d. Don't get anything in front of the gun that you don't want a hole in.

I have taught marksmanship, collected guns, fired competitively, and been a hunter for more years than I like to count. You wouldn't believe some of the dumb things I've seen people do.

Like the time I purposely placed a real, but unloaded and workable, pistol on a coffee table in my home for a couple of weeks. Of the dozen or so people who picked it up, only two checked to see if it was loaded. A half dozen or so picked it up, pointed it aimlessly around the room, clicking the hammer. Two guys picked it up, pointed it at themselves, and pulled the trigger.

Then there was the airman out in Wyoming who said that his .45 automatic was unloaded when he started out in his car across a rocky field, steering wheel in one hand, and .45 in the other. He killed his Volkswagen and shot himself twice in the leg.

Hunting safety and home firearms safety are serious business. There are few greater tragedies for one to live with than the terrifying experience of a wife, son, or daughter lying dead because of a completely preventable accident. Or the hunting trip that ends in a hospital emergency room because someone forgot or didn't understand the rules. We have all seen them before, but one more time won't hurt

the GUN was LOADED''

*More importantly,
they could **SAVE** your **LIFE**
or the **LIFE** of someone else.*

- a. Consider every gun a loaded gun.
- b. While inspecting a gun, don't point it towards anyone.
- c. Keep guns and ammunition stored separately and under lock and key.
- d. Teach your family about the danger of firearms. They need a healthy respect that comes from understanding, not fear.
- e. Don't transport a gun that is loaded.
- f. Don't fire from a car or moving platform. In most jurisdictions, it is illegal; and you can never be sure what, or who is in your line of fire.
- g. Carry your gun holstered if it is a pistol or muzzle-elevated if it is a rifle.
- h. Don't drag a gun under a fence or prop it up against a tree. Either way, you may end up in front of it when it goes off.
- i. Don't fire at a target that you cannot see clearly. If you have any doubt about what is in your line of fire -- don't shoot.
- j. Obey the law. Illegal hunting is not only dangerous but unsportsmanlike.

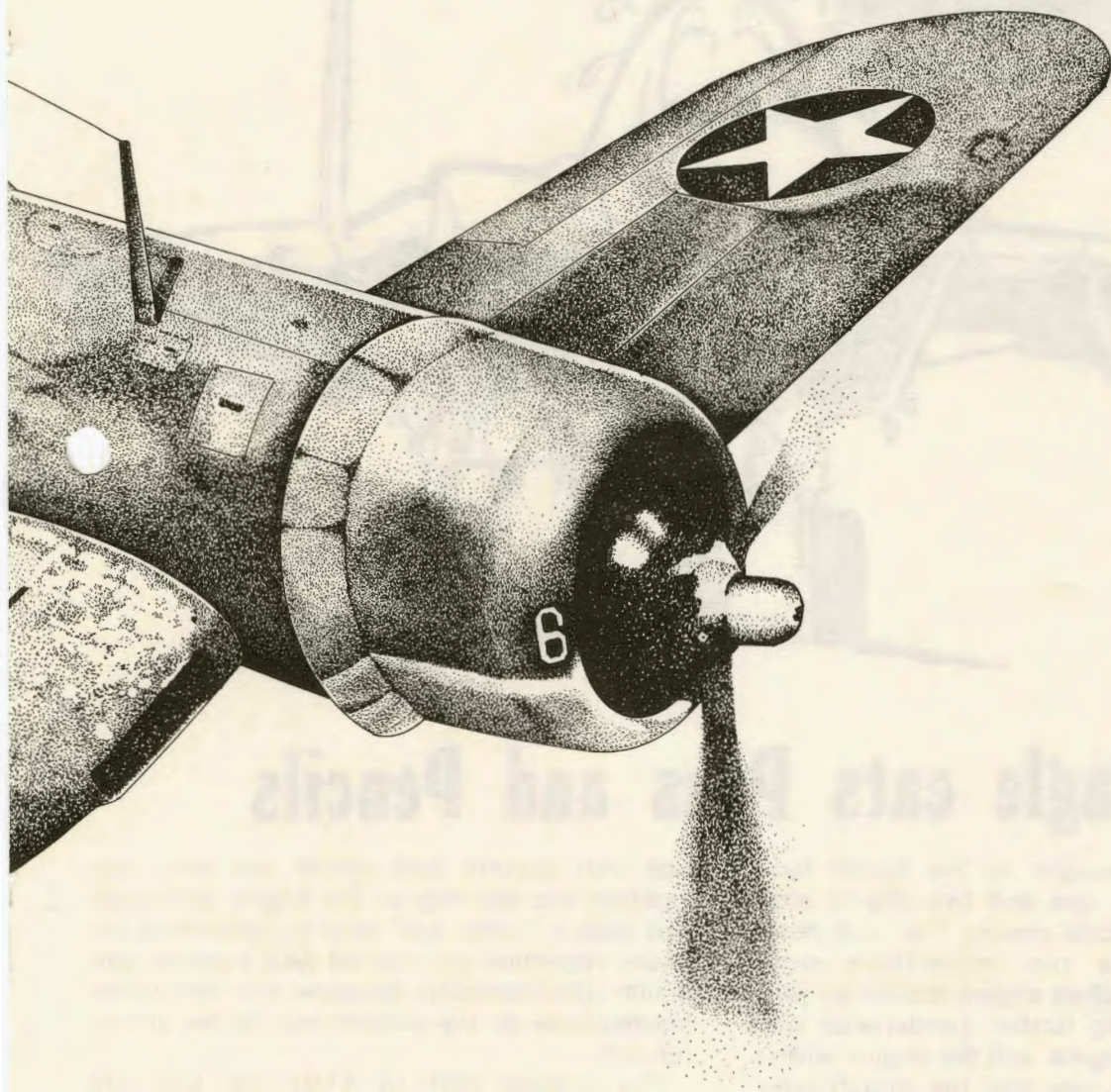


No list is complete. But it all boils down to my first list. A gun will almost always do what it is designed to do. Don't come home with holes in anything you didn't want a hole in.

GOOD HUNTING! ➤

CORSAIR

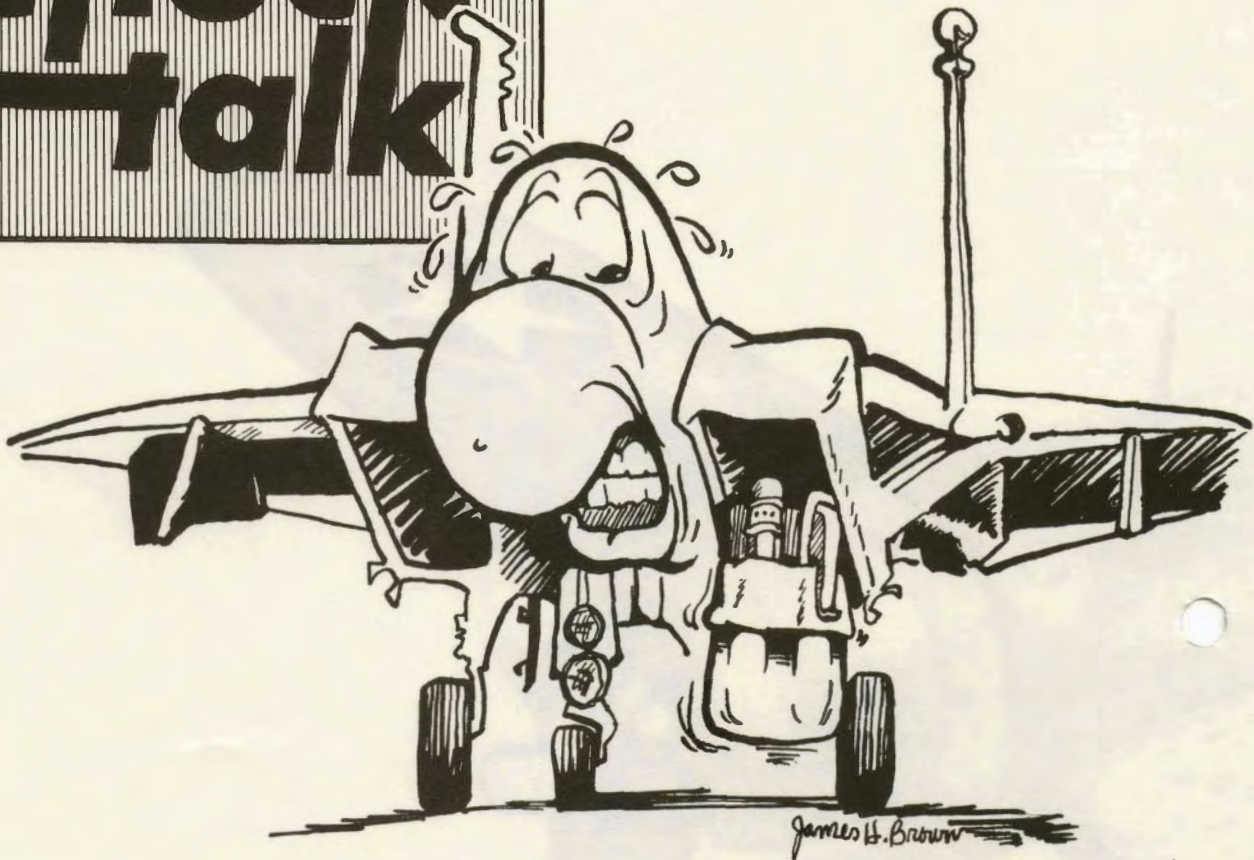




James H. Brown
© James H. Brown 1977

chock talk

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



Eagle eats Pens and Pencils

The F-15 was brought to the sound suppressor for number one and two engine augmentor and operational checks. Pre- and post-intake and engine run inspections were conducted by a qualified engine technician with no defects noted. No further maintenance was performed on the engine, and the engine wasn't run afterwards. The next day, the aircraft crew chief noticed FOD to the first stage inlet fan blades.

Although the engine teardown analysis could find no definite cause for the FOD, it appeared that a pencil pouch of the type used or worn in-

side shirt pockets, with pencils and pens, was ingested into the engine. The engine technician had used a "bunny suit" prior to performing the intake inspection and did not wear a pencil/pen pouch. Unfortunately, someone who performed maintenance on the aircraft prior to the engine run did.

This mishap cost us \$101,144 and 192 manhours to repair ... that's a lot of shekels for us taxpayers and a lot of extra work. Let's strike out FOD ... it's too expensive, and we already have enough work to do, without having to do it over.

MURPHY LURKS IN A BOMB RACK

The F-4 gunnery mission proceeded as planned until the pilot rolled in on the first attack. When he attempted to release a practice bomb from the SUU-21 using DCU-94 circuitry, the SUU-21 jettisoned from the station. What happened to cause this mishap is a perfect example of Murphy's Law: "If something can go wrong, it will."

The wing had an MOI which directed load crews to safety-wire and seal breech caps after the carts were removed. The procedure was intended to provide easy identification of empty breeches and preclude needless, repetitious removal of breech caps to check that the breeches are empty. Unfortunately, in this case, a load crew failed to remove the carts; and the breeches were carted, safetied, and sealed. This

procedure not only set up the aircraft for an unintentional jettison, but also discouraged inspectors from inspecting the pylon for carts because the safety wire supposedly "guaranteed" empty breeches.

Even though the procedure wasn't "Murphy Proof," the mishap still would never have occurred had the Tech Data been followed. After the load crew had uploaded the SUU-21, the crew signed off the aircraft records stating that a functional check had been accomplished. In fact, the check had not been performed. If it had, the carts would have fired at that time.

While there may have been "holes" in the unit's MOI, this mishap could have been prevented if the load crews had been professional. But they took a short-cut. Do you take short-cuts? Is Murphy lurking in your bomb rack?



On 19 July 1977, the 12th Tactical Reconnaissance Squadron, 67th Tactical Reconnaissance Wing, Bergstrom Air Force Base, Texas, made history -- 80,000 accident-free flying hours. This feat has never before been accomplished by any F-4/RF-4 squadron.

The record began at Tan Son Nhut Air Base,

Vietnam in 1967. Approximately half of the 80,000 hours were accomplished under wartime conditions, demonstrating that aircrews and maintenance can accomplish the mission and fly safely at the same time.

Hats off to the 12 TRS and all the maintenance and operational personnel who contributed to this outstanding achievement for the last decade.

WINTER



Winter weather is predictably unpredictable and changes can occur very rapidly. That morning fog oftentimes is blown away by a temporary wind shift, only to have it return at the worst possible time. The sun doesn't go to work before noon, so the morning fog is very slow to lift. The weather guys have a much better chance at busting their forecasts because of the speed at which an air mass can change its character.

That fluffy white stuff which is neat for snowmobiles really messes up runways, reduces VIZ, increases the chances for icing, and makes pre-flight sporting.

Sounds like a lot of bad news, right? Well, there is some good news. Most of the thunderstorms, tornadoes, etc., are left behind with the arrival of "Old Man Winter." But don't be misled ... they'll still be around, but harder to see. Maybe the good news isn't so good after all?

Since the good news appears to be bad news and the bad news dominates, let's review a few of the more hazardous features of winter weather now ... before the temperature drops

lower than a rattlesnake's navel, and the wind blows snow in your mukluks.

A few of the hazards are:

- Increased surface and en-route icing conditions.
- Increased precipitation, including freezing precipitation.
- Low ceilings.
- Strong, gusty surface winds.

Aircrews who fail to take the proper precautions may find the above conditions ruining their whole day. All of the hazards of winter weather operations can't be covered in one article, so we'll take a look at some of the more prominent weather conditions.

One area of winter weather which everyone is familiar with is icing ... both at ground level and in flight. Frozen precipitation or frost accumulated on parked aircraft can be hazardous if not removed before flight. Another problem is the presence of water or mud on taxiways and runways during freezing temperatures. Water or mud splashed on brakes, flaps, landing gear, etc., can freeze and make taxiing and landing a memorable experience. Make sure you follow the Dash One's advice about after-takeoff procedures. If you go cross-country, it's a good idea to brief the transient maintenance folks on any peculiar de-icing requirements your bird may have.

The rain, ice, and snow associated with winter weather can greatly reduce the braking effectiveness of your aircraft. To combat having an exciting experience during taxiing, takeoff, and landing, obtain and apply the Runway Condition (RCR) to your takeoff and landing data figures. Remember to treat RCR as a guide because the stopping distance figure you derive from the Dash One chart is based upon ideal conditions, i.e., pilot reaction time of less than three seconds, optimum braking, full moon, etc. RCF

WEATHER

should never be the final determining factor of the suitability of a runway for takeoff or landing.

En-route icing should be anticipated during all winter flights conducted in clouds with temperatures near or below freezing. The following discussion will familiarize you with the icing conditions generally associated with different atmospheric conditions.

Stable air masses, those which are cooled from below, often produce stratoform type clouds with extensive areas of relatively continuous icing conditions. Icing in middle-and low-level stratoform is usually confined to a layer between 3,000 and 4,000 feet thick. Both rime and mixed icing can be present in stratoform clouds and present a hazard due to their great horizontal area of coverage. The intensity of icing generally ranges from trace to light with the maximum values occurring in the upper portion of the cloud. High-level stratoform clouds are composed mostly of ice crystals and give little icing.

Unstable air masses, those which are heated from below, usually produce cumuloform clouds with a limited horizontal extent of icing conditions. You can expect the icing to become more severe at higher altitudes in cumuloform clouds. Icing is usually clear and, because the combination of super-cooled water droplets may be several times greater than that generally found in stratoform clouds, the rate of accumulation is greater than that in stratoform clouds.

As a rule, you can generally associate the types of icing with the following temperature ranges:

TYPE	TEMP
Clear	0°C to -10°C
Clear and Rime	-10°C to -15°C
Rime	15°C to -20°C
Possible Rime	Below -20°C

Another winter hazard which has lured many jocks into an early grave is low ceilings. When you check in with your destination METRO and they give you a forecast like, "Indefinite ceiling 500 feet obscured, visibility one-half mile in fog," you should be alerted to a potential threat to your longevity. The key word in the forecast or observation is "obscured." Why? We can normally see terra firma when penetrating a 500 feet cloud base ceiling (Fig 1). Not so, with an obscured ceiling of 500 feet. Generally, you will not see the runway environment when you break out at the 500-foot level because the obscuring phenomenon usually reaches the surface (Fig 2). You should be able to see the ground directly beneath the aircraft after passing through the ceiling height, but don't get suckered in and fly into trees, telephone poles, elephants, ants, etc.

You should remember that the weather folks relay prevailing visibility ... that's spelled "HORIZONTAL" visibility, and is much less than your slant range visibility. Here's a brief rundown on the types of visibilities:

a. Prevailing visibility: The greatest visibility which is equaled or surpassed throughout half of the horizon circle; not necessarily continuous. It is the visibility normally reported in a weather sequence.

b. Runway visibility (RVV): A value derived either by instruments or visually, which best represents the horizontal distance a pilot can see down the active runway in the direction of takeoff or landing. When high intensity runway lights are operative, runway visibility observations will take this into account and the reported visibility will be the maximum possible with the lights on.

c. Runway visual range (RVR): The maximum distance in the direction of takeoff or landing at which the runway, or the specified lights or

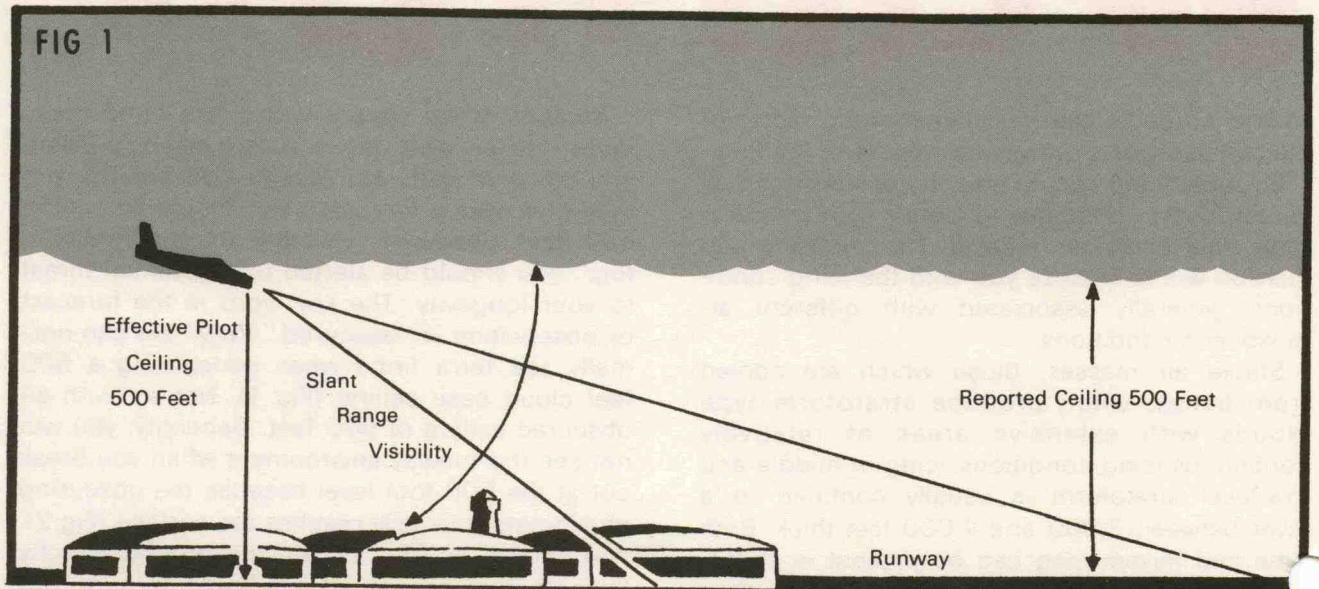
winter weather

markers delineating it, can be seen from a position above a specified point on the runway centerline at a height corresponding to the average eye-level of pilots at touchdown.

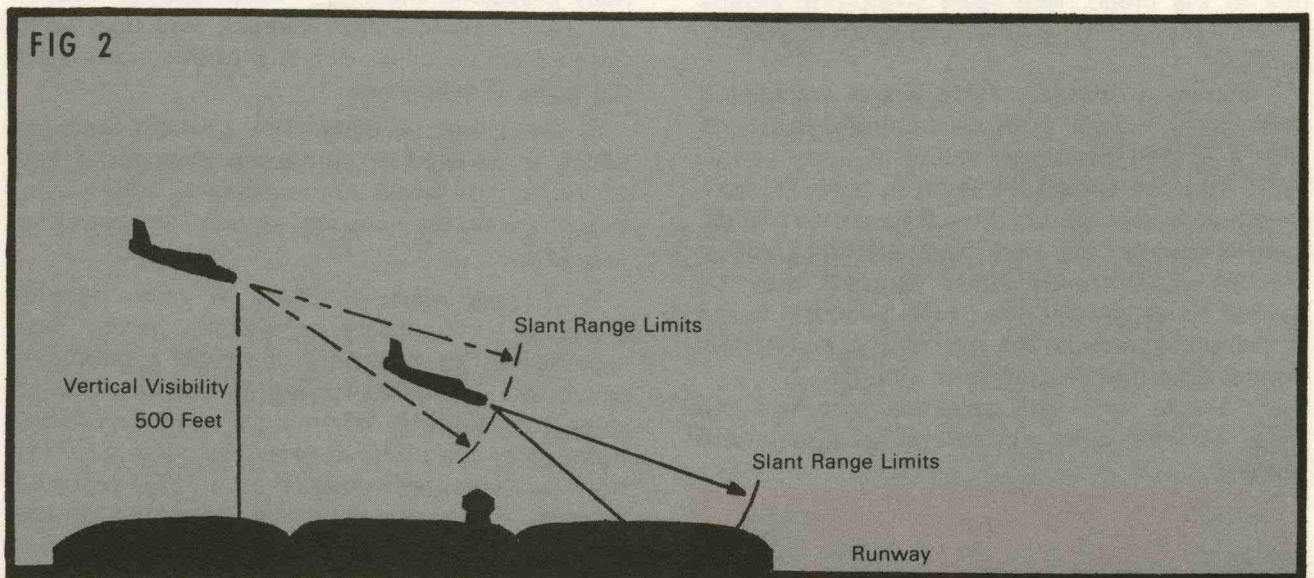
A partial obscuration presents the same problem for an aircraft in the approach pattern be-

cause the pilot still lacks information concerning slant range visibility or the altitude at which he will be able to distinguish the approach lights.

Winter brings with it a brand new bundle of the problems, all of which can be overcome with a little preplanning. Now is the time to start thinking about it; before the frost forms on your long johns. Don't be a disbeliever, winter's a' coming.



Cloud Ceiling of 500 Feet with no Restriction to Visibility Below Clouds



Surface Based Obscuration with Vertical Visibility (Obscured Ceiling) of 500 Feet

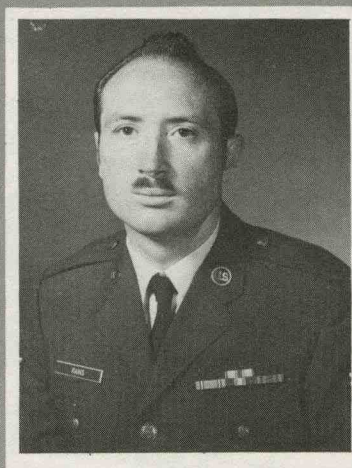


TAC

SAFETY AWARDS

Individual Safety Award

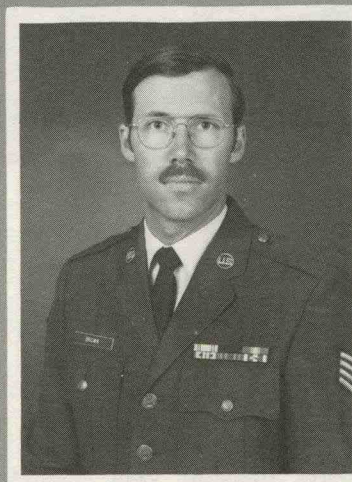
Staff Sergeant Steven L. Rains, 35th Avionics Maintenance Squadron, 35th Tactical Fighter Wing, George Air Force Base, California, has been selected to receive the Tactical Air Command Individual Safety Award for this month. Sergeant Rains will receive a desk set and letter of appreciation from the Vice Commander, Tactical Air Command.



SSgt Steven L. Rains

Crew Chief Safety Award

Staff Sergeant Richard C. Brown, 4458th Aircraft Generation Squadron, 58th Tactical Training Wing, Luke Air Force Base, Arizona, has been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Sergeant Brown will receive a desk set and letter of appreciation from the Vice Commander, Tactical Air Command.



SSgt Richard C. Brown

IT'S OK, I have



By Capt Ben A. Calloni
4 TFS/388 TFW
Hill AFB, UT

The F-4D mission was fragged as an air refueling followed by ground attack on a controlled range. The preflight, start, taxi, and takeoff were normal. Our three-ship proceeded to the KC-135 tanker in the refueling track.

After coming off the tanker, while proceeding to the range, my GIB and I noticed that the altimeter and VVI were fluctuating. I turned the Static Pressure Compensator (SPC) off and all fluctuations stopped. After informing the flight leader of the problem, I then returned to base which was about 110 miles away.

We contacted the SOF who directed us to practice instrument approaches until the fuel weight was down to an acceptable level for

AFTERBURNERS!

landing. The weather was VFR.

I informed my GIB that we'd fly a half flap, 17-unit AOA approach for the first GCA. (Note: For those readers not familiar with the F-4, this is the configuration for a single-engine emergency approach and landing. Half flaps vs full flaps yields a small loss of lift, but a great loss of drag. A 17-unit AOA approach results in approximately 10 kts higher air speed than an "on speed" AOA.) I chose this configuration to keep us on the "high side" of the power curve. The aircraft was configured with a SUU-20 bomb dispenser, two wing tanks, and a SUU-23 gun pod. The wing tanks were still feeding, but we estimated approximately 13,500 lbs of fuel on board. The estimated gross weight was 46,500 lbs which resulted in a 185 KCAS approach speed. The GCA was normal except descent rate was higher (about 1,300 - 1,500 fpm) due to a higher than normal approach speed.

We decided to initiate the missed-approach at 300 ft AGL rather than continue to Decision Height (100' AGL). At 300 feet, I increased both throttles to Military Power. I expected a sluggish response, however, I assumed the extra 200 feet, one-half flaps, and 10 kts would help.

As the expression goes, "we got our eyes watered." Going through 100 ft AGL, the descent rate was still 600fpm! I selected full A/B on both engines. Big Ugly leveled off about 25 ft, hung a moment, then grudgingly started a climb.

We got our stuff in one bag, came around, and set up for another GCA. The wing tanks had just burned dry (11,700 lbs FOB) when we started down the glide slope. We flew the same parameters as before, expecting about the same results. Sure enough, A/B was again needed. This time our descent rate was only 400 fpm going through 100 ft. Engine thrust was normal throughout the flight and checked OK. All subsequent approaches were normal and A/B was not needed.

What is the point to this story? All through UPT and RTU, we are taught in aerodynamics classes that most of today's fighter aircraft are not underpowered like the F-100 and others were (some remember the Sabre Dance). Yet, in some circumstances, the F-4 does have a problem. The one thing I didn't mention is that the home-drome has an elevation of 4,780 feet; and this approach occurred in summer when the density altitude was between 6,000 - 7,000 feet. Granted, not many bases are as high as Hill Air Force Base, but a lot of bases have elevations and/or desert temperatures that can cause a high density altitude factor. (Note: All the F-4 bases in 12 AF, except Luke, have elevations around 3,000 feet and higher; and all of them are in deserts with summer temperatures pushing 100°F).

The important factor to consider is gross weight. Sure, you've got afterburner -- but what if you only have one engine cooking? In our case, we had 4,800 pounds more thrust available with two engines in Military Power than we would have had with one engine in full A/B ... and we still couldn't hack the program! That's why the first step in the single-engine landing procedure is REDUCE GROSS WEIGHT.

How about that emergency situation with an engine failure on takeoff? The crew comes right around to set the bird on the ground but doesn't reduce weight. If the aircraft should get low on glide slope (very likely since it has limited thrust) and the crew decides to go around, they just might find out that Big Ugly is going to keep descending. The crew either rides it in short of the runway or ejects if altitude and sink rate permit.

Need I pursue the point further? You can jettison tanks or dump fuel -- it's your preference. But the Dash One says: REDUCE GROSS WEIGHT. In a single-engine situation, you already have enough problems. Don't compound them!

THE DIV7 DIV7 DUV7-DI7 PHYZ-BIZ

THE DEADLY DECIBEL (dB) Part II

By Lt Col Harold Andersen
HQ TAC Physiological Training Coordinator

Last month we left off with a promise to return with some info on what you can do to avoid hearing loss. Probably the best place to start is with a brief discussion of the phenomenon we call "sound." To begin with, vibrating objects disturb the surrounding gas molecules which also vibrate in response, producing a variation in atmospheric pressure. The disturbance spreads in ripples, much like the ripples seen when a pebble is dropped into a placid pond, at about 340 meters/sec (750 mph) in sea level air and about 1,490 meters/sec in sea water. The ripples, or vibrations, may be close together (high frequency) or far apart (low frequency) and have a "wave form" appearance, changing

through a complete vibratory cycle a certain number of times (cycles) per second (cps). This is also known as a "Hertz." For example, the standard tone "A" is formed when the air pressure changes through a complete cycle 440 times per second (440Hz). "Decibels" are used to express sound levels and are relative quantities. The decibel (dB) scale is logarithmic and uses OdB as a reference point. This is the weakest sound that can be heard by a person with very good hearing in an extremely quiet location. (This standard sound pressure (OdB) has been assigned a value of 20 micronewtons per square meter (20 MN/m²) so that all audiologists and other interested parties will be using the same starting point.) Some typical values for sound levels are:



20dB: Studio for Sound Pictures
 40dB: Residential Area - Night
 60dB: Large Store
 80dB: Inside Sports Car (50 mph);
 Pneumatic Drill (50')
 100dB: Power Saws
 120dB: Jet Takeoff (200');
 Discomfort Begins
 140dB: Pain Begins

Let's take a look at noise measurement data taken within the cockpits of various aircraft. It has been found that cockpit noise levels are usually highest during takeoff. However, some aircraft capable of very high speeds, such as turbo props and jet powered aircraft, actually had higher noise levels measured during high-cruise than during takeoff. Some ball park range values for various types of aircraft which may be of interest to you are:

- Fixed Wing -
 - 1 Recip Engine: 100dB Low Cruise; 108dB High Cruise
 - 4 Recip Engines: 91dB Low Cruise; 104dB Takeoff
 - 1 Turboprop Engine: 91dB Low Cruise; 100dB Takeoff
 - 4 Turboprop Engines: 88dB Climb; 96dB High Cruise
- Fixed Wing -
 - Internal Turbojet/Turbofan: 102dB Normal Cruise; 105dB Takeoff
- Helicopter -
 - Recip Engine: 102dB Normal Cruise; 104dB Lift-off
 - Turboshaft Engine: 96dB Lift-off; 101dB High Cruise
 - Turboshaft, twin rotors: 101dB High Cruise; 103dB Normal Cruise

When you're looking at these figures, remember that the dB scale is the logarithmic expression of the ratio of two values: the threshold value (0dB); and the noise level being measured -- whether it be a jet engine or a dog barking. Since the scale is logarithmic, it has been calculated that an increase of 6dB indicates about a twofold increase and 10dB about a threefold increase in noise. We should also remember that hearing damage depends on the duration of the exposure, and that the experts

agree that a protracted or repeated unprotected/inadequately protected exposure to high sound levels causes hearing loss.

The best approach to protection of the individual would be to design devices so that the noise level during operation is not hazardous. Obviously, this ideal solution has its limitations, but there is no doubt that some tools, appliances, vehicles, etc, could be redesigned to lower operational noise levels. The next best alternative would be to locate or use noisy equipment only in isolated areas, either by enclosing them or separating them by distance. Again, it is obvious that this approach also has limitations which brings us to a third, still less satisfactory, alternative: require personnel to wear protective equipment whenever they are exposed to a noise hazard.

Whenever possible, the AF uses alternatives two and three. I don't know of any program which relies on the first alternative. The trade-off of a noisy jet engine for a quiet one would, in all probability, entail a trade-off in power. However, it is feasible to locate exceptionally noisy activities on the remote areas of the base and to enclose them with acoustically impenetrable materials to act as a muffler. Engine test stands, run-up areas, firing ranges, etc, are all good examples of the second alternative. The third alternative is most familiar of all. We've all seen ear plugs and protective muffs, even though we may not always use them.

Personal ear protectors are commonly available in the form of ear plugs and ear muffs. Plugs are insert devices and generally come in two forms. Some are malleable devices: plugs of wax impregnated cotton or other cellulose material (like the "Flents" plugs), which are molded with the fingers to the proper fit, then inserted in the external ear canal. They are usually thrown away after one use. The other form is the V-51R plug (single flange). These are specially fitted devices of soft, smooth plastic and are intended to be used many times. Also commonly seen is the ear muff type of defender which fits over and around the external ear. There are several types of muffs; the difference being mainly in the material of the covering cushion. There are two other types of ear protectors which are not commonly seen: the semi-inserts, ear plugs which fit into the ear canal and are held in place by a headset band; and a rigid helmet which covers the entire head. These latter two are probably

dBA	Unprotected Permissible Exposure (Min)	Attenuation of V-51R Plugs	dBA Attenuated	Protected Permissible Exposure	Attenuation by V-51R Plug & David Clark DC-117 Muff	dBA Attenuation	Protected Permissible Exposure
135	0	-25	110	5.3 Min	-37	98	42.5 Min
122	0	-25	97	50 Min	-37	85	403 Min
109	6.3	-24	85	403 Min	-36	73	960 Min

less comfortable than the plugs and muffs. The helmet is uncomfortable because it is hot and heavy, and the inserts are just plain uncomfortable.

Regardless of the type of protection used, there is one basic principle which must be observed if the device is to provide its maximum attenuation capabilities. The seal between the protective device and the surface against which it touches must be airtight. If air can get in, so can noise, and the acoustic attenuation will be markedly reduced. It should be noted that there is an upper limit to the protection provided by any device or combination of devices. No matter how good the seal, no device can give more than about a 50dB reduction in noise level. It has been found that noise can outflank the ear defender device and enter through the bones of the head.

Most people recognize that use of two protective devices simultaneously would probably give better protection than either alone. Unfortunately, the reduction in dB by each device is not directly additive to the other. For example, if ear plugs provide about 25dB attenuation and a set of ear muffs which provide another potential 25dB attenuation are used together, the resultant reduction is not 50dB, but about 37dB, as shown in the chart above.

A worker whose job environment measured 122 dBA (Col 1) would not be permitted to work at all unless he used some type of ear defender. The V-51R ear plugs can attenuate about 25dB, so that the attenuated dB level declines to 97dBA, and his working time becomes 50 minutes. If he also wears the DC-117 ear muff simultaneously with the V-51R, the combined attenuation of both devices becomes 37dBA; the attenuated dBA drops to 85 (122-37), and his permissible work (exposure) time increases to 403 min (6.7 hrs). Thus, he gets the job done and incurs no damage to his hearing apparatus. I'd say that was well worth-while!

AFR 161-35, Hazardous Noise Exposure, outlines everyone's responsibilities in the noise protection area, starting at the top with HQ USAF required activities and working its way down through channels to the individual. The individual (that's you and me) is required to "... implement and continuously apply the procedures established by the commander for maintaining effective noise-exposure control, including wearing proper ear-protective devices." Further, the individual must cooperate fully with the Medical Service on all actions to prevent individual impairments arising from excessive noise exposure.

Some AF personnel are careless and/or treat hazardous noise exposure in cavalier fashion; some will frankly tell you that they don't worry about hearing loss and besides, if they do incur some permanent disability, they can always get a "pension"! Well, some of those boys are in for a big surprise when they try to convince a review board that they lost their hearing while using the plugs and muffs. It will be up to them to prove that they always wore the protective devices in performance of duties in hazardous noise environments, and that their deafness is therefore a service connected disability -- quite a formidable task.

Your hearing is a very precious gift, and many don't realize its value until it's gone -- lost as a result of an indolent, or perhaps ignorant, attitude. Helen Keller, who was both blind and deaf from infancy, regarded her deafness as a greater disability than her blindness! Think about that next time you stroll out on the line without your plugs and muffs! And remember, your 16 or so hours away from your job can be a critical recovery period. If you insist on continuing the assault on your hearing apparatus by off-duty activities which generate decibel levels in three figures, then you might as well get ready for a real quiet old age. As we noted above -- it's your responsibility.

NEW TAC SAFETY AWARDS

On 1 July 1977, Tactical Air Command instituted its new Safety Awards Program. The purpose of this program is to provide recognition to numbered air forces, units, and individuals by presenting some tangible acknowledgment for a job well done. Pictured on this page are the new award elements for annual awards and a brief rundown of the purpose of each award.

TAC Distinguished Aircrew Flight Safety Trophy

To provide recognition to the most outstanding aircrew of the eligible Aircrews of Distinction from the previous calendar year.

• • •

TAC Commander's Trophy for Flight Safety

To provide recognition to the numbered air force with the lowest command controlled * DOD Class A Mishap Rate each calendar year.

TAC Flight Safety Trophy

To provide recognition to individual wings for 12 consecutive months command controlled DOD Class A Mishap-Free Flight Operations (Replaces TAC Flight Safety Achievement Award).

* Command Controlled Mishaps: Those mishaps with cause factors identified by the Accident Board directly attributed to the unit itself, i.e., pilot error, supervisory causes, and field-level maintenance error.



LETTERS



© Stan Hardison, 1977

Editor

As an interested reader of your eye-catching "TAC TALLY," I have taken note of the changes in format over the last four months. It remains an eye-catcher, however, what caught my eye most is the fact that the 117 TRW has been designated the 117 TFW in the May issue. True, some of the flying types would like to play the role, but we feel that we have a much more important position in "RECONNAISSANCE." Please give us our due.

TSgt P. E. Taylor
AF Technical Advisor
117 RTS/IN (ANG) Birmingham MAP, AL

Sarge

Oops! As you can see, you're back in the recce role on this month's "TAC TALLY." Keep up the good work and "Kill 'em with film."

ED

P.S. How about an article?

Editor

Your story on page 21 of the June issue (Feathered Foes) was accurate, but your photo layout was not. In all the RF-4Cs I've seen, the time

release mechanism is on the right side of the seat frame. Also, note the location of the armament safety override button in your photo. Your photo was simply printed backwards.

It is unfortunate that you could not print one or more of the photos taken of the windscreen area. For those of us who've never before seen the results of a bird strike, they are quite sobering.

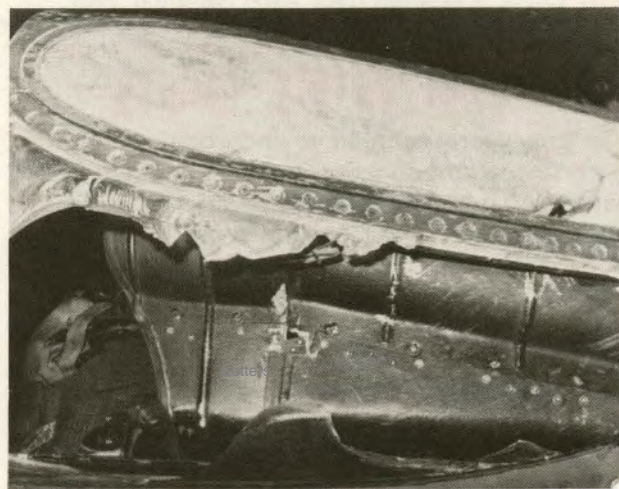
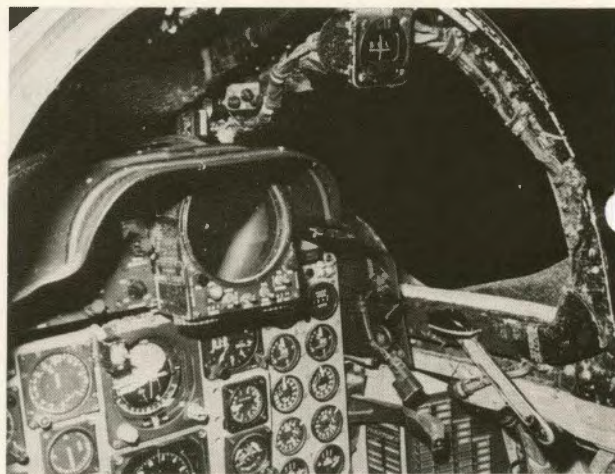
Capt Robert L. Rundall
91st TFS/67 TRW
Bergstrom AFB, TX

Bob

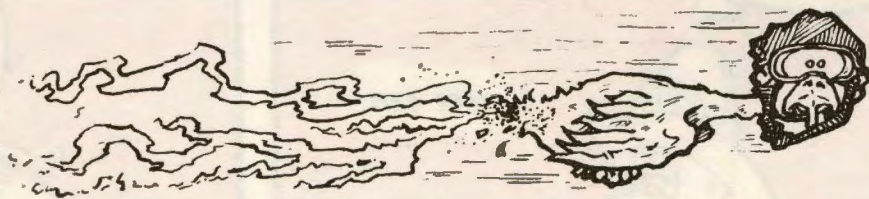
The photo was indeed reversed during developing. However, it is a mirror image of the original.

Since you requested some additional photos of the windscreen area -- here they are.

ED



TAC TALLY



	TAC			ANG			AFR		
	AUG	thru AUG		AUG	thru AUG		AUG	thru AUG	
		1977	1976		1977	1976		1977	1976
MAJOR ACFT. ACCIDENTS ▶	1	18	20	1	8	6	0	1	2
AIRCREW FATALITIES ▶	0	8	9	0	3	2	0	0	1
TOTAL EJECTIONS ▶	1	16	17	1	8	4	0	1	1
SUCCESSFUL EJECTIONS ▶	1	13	13	1	5	4	0	1	0

TAC'S TOP "5" thru AUGUST

TAC FTR/RECCE	
accident free months	
22	4 TFW
16	474 TFW
14	56 TFW
12	33 TFW
11	67 TRW

TAC GAINED FTR/RECCE		
accident free months		
65	127 TFW	ANG
31	156 TFG	ANG
26	117 TRW	ANG
20	434 TFW	AFRES
20	162 TFTG	ANG

TAC/GAINED Other Units		
accident free months		
121	182 TASG	ANG
101	135 TASG	ANG
93	507 TAIRCW	TAC
90	193 SOG	ANG
82	110 TASG	ANG

MAJOR ACCIDENT COMPARISON RATE 76/77

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

TAC	76	2.9	8.6	9.0	7.3	8.0	8.1	6.9	6.8	7.5	8.1	7.4	7.0
	77	0.0	5.3	5.8	5.4	5.1	5.0	5.6	5.1				
ANG	76	10.5	5.0	6.5	4.8	3.8	3.9	3.4	3.5	3.7	3.9	4.0	4.1
	77	0.0	3.1	1.9	5.7	4.4	5.4	5.4	5.4				
AFRES	76	0.0	0.0	11.3	8.1	6.1	5.0	4.2	7.2	6.4	5.7	5.3	7.3
	77	0.0	0.0	10.1	7.4	5.8	4.7	4.0	3.5				

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

