TAC ATTACK

JANUARY 1977

LEARN FROM THE PROS ..... Page 4

TAC ATTACK JANUARY 1977 VOLUME 17 NUMBER 1

JAN

FOR EFFICIENT TACTICAL AIR POWER

FEATURES

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TACRP 127-1

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Angle of ATTACK

OBJECTIVES...1977

In 1976, our major aircraft accident rate was the highest since 1968. It is obvious that we must reevaluate our past performance, establish our goals and standards for 1977 and proceed to take the necessary action to meet them.

We have done a reasonable job of identifying the causes of materiel failures. Although long lead times and money are the driving factors for the corrective actions, substantial progress was made in 1976. We must do better in the year ahead. Approximately 50 percent of our aircraft accidents resulted from causes over which we should have had complete control ... procedures, training, and supervision. These are the areas where we must focus our efforts during 1977.

The experience level of our aircrews and maintenance personnel is low. All training programs and procedures, local and higher headquarters directed, must be constantly monitored, evaluated, and changed to ensure essential elements are included. Don't assume that syllabi, phase manuals and continuation training materials are adequate. Everyone in TAC shares the responsibility for the content of these programs ... not only the person or agency responsible for their publication. The dynamics of the training requirements in TAC require each of us to share in a continual review and updating of our training programs and procedures.

TAC instructor pilots, flight commanders, RSOs, RCOs, squadron operations officers and commanders have the responsibility of supervising flight operations to the nth degree. As TAC supervisors, we must reevaluate our performance in 1976, determine what we could have done differently or additionally, and then apply these measures in 1977. The man in the cockpit is the key to flight safety. We supervisors can make or break him, depending on what we ask him to do and under what conditions. If we ask a well trained aircrew to fly a mission within his capabilities in a well maintained aircraft and provide him with just the right amount/kind of supervision, we will approach our goal of aircraft accident prevention. In all cases, the right training, the right tactic, and the right procedure are the safest ways to go.

TAC's accidents should be more than just history ... we must learn from our past mistakes. The direction of our efforts during 1977 should be clear. We must attack the causes of our people-preventable accidents ... eliminate the pilot, maintenance, and supervisory errors. To effectively accomplish the TAC mission, we must do the job right, the first time.

George M Sauls

GEORGE M. SAULS, Colonel, USAF
Chief of Safety

DOWN TO EARTH

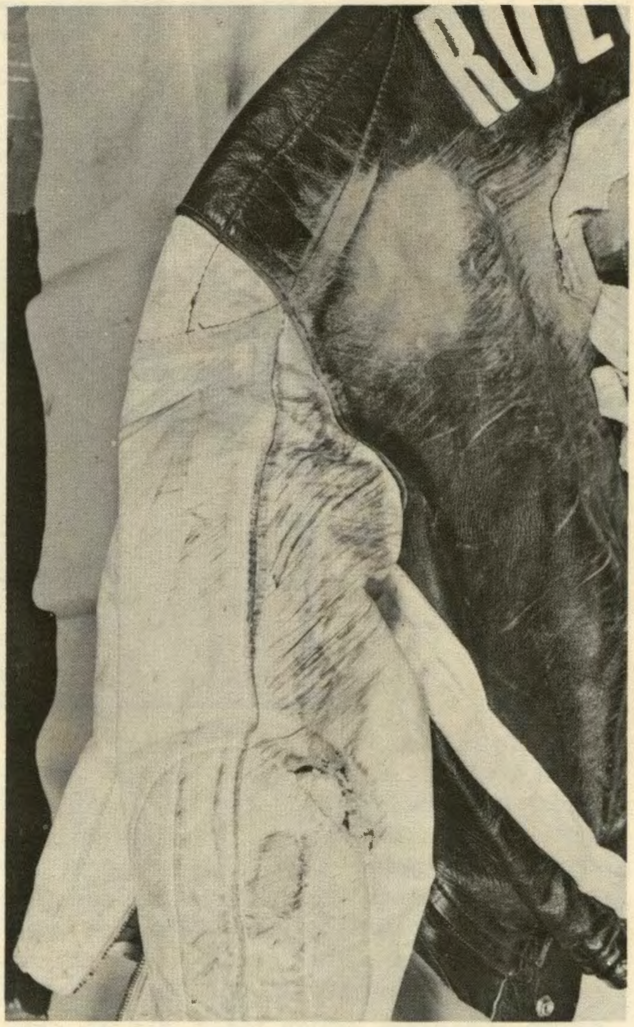
Learn from the PROS

Capt Mike Roehr
561st TFS
George AFB, CA

It's a beautiful, warm, sunny day. You want to go out for a short motorcycle ride, get a little sun, and feel the wind in your hair. Since you'll only be gone for a little while, you jump on the bike with what you had on at the time: Cutoffs, a T-shirt, and no shoes. You are smart enough to grab your wallet with your driver's license, but why bother with putting on different clothes for such a short ride? Besides, you feel free dressed this way; you can enjoy the sensations of wind and sun more fully. You have no worries, right? Wrong!

Here are some of the other sensations you may experience before you return. The thrill of sliding down a giant piece of sandpaper at any speed from 5 to 55 mph is something you won't forget soon . . . whether it's asphalt, concrete, gravel, or dirt. Loose or imbedded gravel does a great job of punching small holes in exposed skin and of burying itself at least one layer below whatever skin you have left. You may get the kick of having a footpeg or gearshift lever punched into your ankle if you go down with the bike. And the ultimate sensation is when your head (with the wind blowing through your hair) slams into the road, or curbing, or a car, or whatever it finds first. This sensation has an advantage in that it may help you to permanently forget the others.

Now you're saying: "Wait a minute! I just went out for a ride and you have me falling on all kinds of roads and messing up my body. I'm not planning to fall down." That's always the case, but the incidents still occur. The automobile is always out there giving motorcycles no mercy. The road conditions may suddenly change, causing a fall. The motorcycle itself can cause a spill through unexpected engine or gearbox seizure, brake malfunctions, or tire failure. So,



every time you ride, the potential for an unplanned, unwanted contact with the ground is there. You need to be prepared for it just as professional motorcycle racers are.

The individual, who was wearing the protective clothing pictured here, was out for a short ride one sunny day at Willow Springs Raceway in California, where he was participating in a sanctioned road race. He is a professional motorcycle road racer (also an Air Force F-105 Wild Weasel pilot). While he was in a turn, a materiel failure of a neoprene seal caused an engine seizure resulting in an immediate rear wheel lock-up and a high-side fall at 105 mph. This was not a pleasant experience for the rider: sliding, flipping, and rolling along the asphalt track for some distance and then into the dirt. Fifteen minutes later, he was walking around the pits planning the repair job on the damaged machine. True, he suffered a small chip of a wristbone, bruises, and sore joints, but nothing

Capt MIKE ROEHR is this month's Fleagle T-shirt winner.

Learn from the PROS....

serious at all.

How does a person survive an unexpected fall of such violence at so high a speed? The answer is Protective Clothing: The helmet was repeatedly pounded and ground against the asphalt and shows considerable damage. The rider didn't even get a headache. The face shield was ground away across one eye with no personal damage due to the full face coverage helmet. The heavy leather boots received deep gouges which could have severely damaged the rider's ankles. The leather pants and jacket were worn through in several spots and ripped open in two places. In all these areas, the leather absorbed the damage that could have been done to the body. Leather gloves were worn through, sacrificing themselves to save skin and knuckles.

We realize that the average rider will not be cornering at speeds over 100 mph or obtaining speeds up to 175 mph on straights; we trust that speed limits will be observed and common sense practiced. This article doesn't suggest that everyone wear full leathers on every outing (however, it isn't a bad idea); but there are minimum clothing requirements for smart riding.

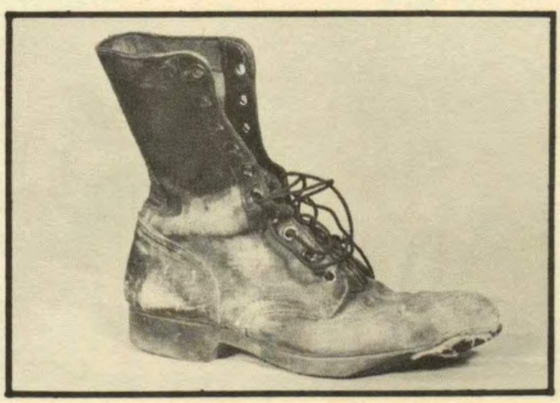
1. Wear a full coverage or full face coverage helmet whenever you ride a motorcycle. Get in the habit. Don't do it because of laws or regulations; do it because it's dumb not to. Always include eye protection - preferably a face shield.

2. Wear leather shoes or boots; boots are best. Tennis shoes are poor; sandals or bare feet are ridiculous. (Your ability to control difficult handling situations is nil without shoes). If you need dress type shoes, think about substituting dress boots.

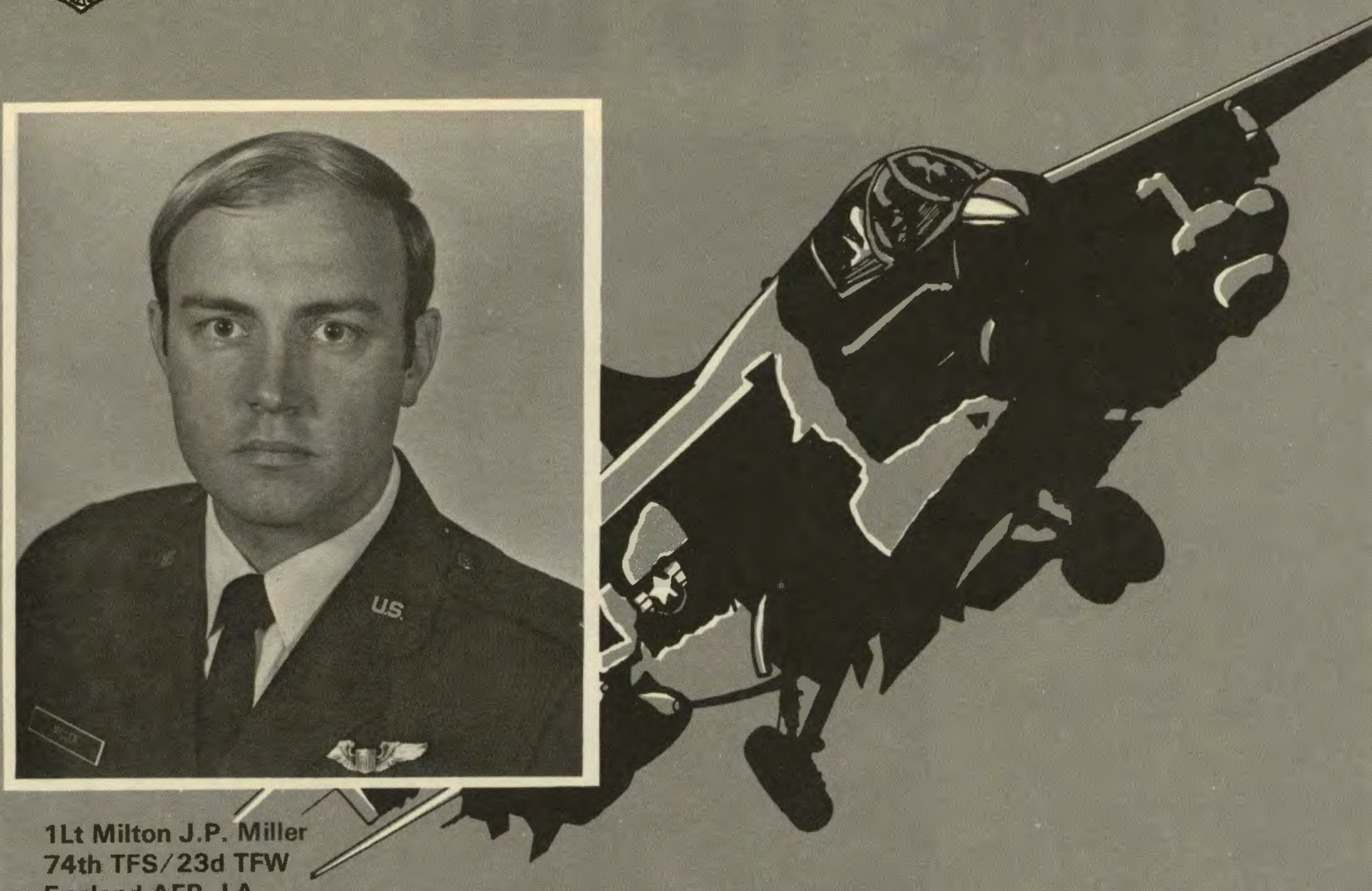
3. Wear leather gloves, as heavy as good control will allow. Hands are particularly susceptible to injury, and they are complicated, hard-to-repair instruments.

4. Wear long pants. Swim or tennis clothing can be worn under them. Always wear a long sleeved jacket, the heavier, the better.

Take advantage of the experience of this competition rider and many others. We hope you never take a spill, but put forth the effort to be dressed properly, just in case it happens. The skin you save will be your own.



AIRCREWMAN OF DISTINCTION



1Lt Milton J.P. Miller
74th TFS/23d TFW
England AFB, LA

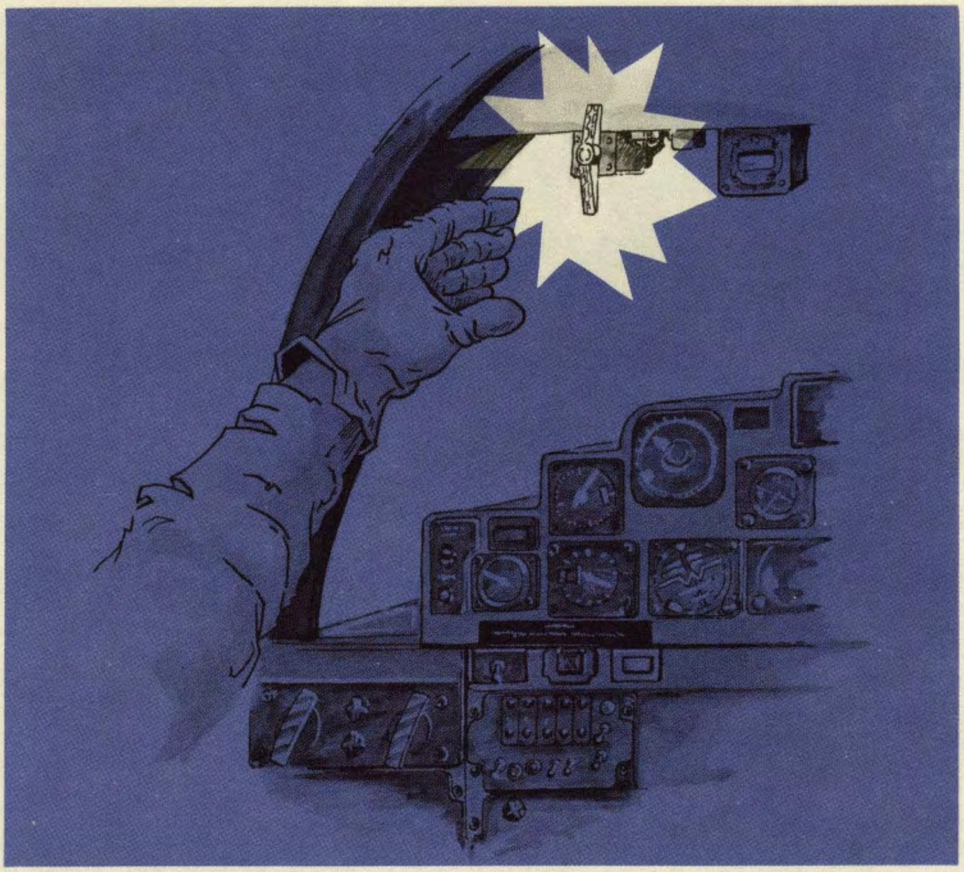
Lieutenant Miller was on a night ground attack training mission. The flight of A-7D aircraft entered the range and rendezvoused with an O-2A FAC who illuminated the target area with a flare. As the flare lit, all ground references disappeared, and the target area became obscured by a white "milky" haze.

During the turn to downwind, the attitude directional indicator (ADI) and heads-up display (HUD) in Lieutenant Miller's aircraft began tumbling. After rolling the aircraft to a straight-and-level indication on the standby ADI, a crosscheck of the performance instruments revealed the aircraft to be climbing in excess of 4,000 feet per minute and the airspeed decreasing through 250 knots ... the standby ADI had also failed.

Now totally disoriented with respect to outside references, Lieutenant Miller advanced the power and began a pushover and roll to center the turn needle. Using the altimeter, airspeed indicator and vertical velocity indicator (VVI), he successfully executed a partial-panel, unusual-attitude recovery and stabilized the A-7D in level flight. Lieutenant Miller then began a slow turn, using the turn needle, altimeter, and VVI as a reference, to allow the lead aircraft to join with him. Once joined, the flight executed a successful formation recovery.

Lieutenant Miller's quick and decisive actions during a critical phase of flight prevented the loss of a valuable combat aircraft. His single-handed performance during this emergency qualifies him as the Tactical Air Command Aircrewman of Distinction.

TIME TO GO



The issue of when to have the command ejection selector valve rotated open has long been one of controversy for F/RF-4 aircrews. This article expresses the sole opinion of the author on that subject, and in no way reflects the policy of Tactical Air Command. We welcome any comments concerning this controversial issue and solicit articles with an opposing view. ED

A few months ago while on the range, I watched the crew in front of me ride their out-of-control Phantom into the ground. The suddenness, the flame, even my reactions depressed me and made me recall combat missions I would rather have forgotten. Trying to discern something valuable from such a loss, I have found two ideas to communicate. The first is that ejection is not an easy decision, the second concerns dual sequenced ejection from the F-4.

In 1971, I flew a burning F-100 until the hydraulic system quit and the control stick stopped working. Even then, the thought of leaving that

By Capt David Greenlee
4th TFS , 388th TFW
Hill AFB, UT

warm, comfortable cockpit for a parachute that might, or might not, work had no appeal. I ejected because the rest of my choices were all used up. Most ejectors (ejectees?) I've talked to, say the same thing: "There was no doubt in my mind - it was time to get out."

The difficulty, then, lies in convincing yourself that the time to get out has arrived. If you flew the aircraft out of control, the tendency to want to correct your error and fly back into controlled flight will be strong. If you know you goofed, you want to fix it.

We all know that if a stalled aircraft unloads, it will soon respond to control inputs again. Now, picture yourself out of control on the range, with the ground and sky doing crazier things than you've ever seen. What do you want more than anything in the world -- an unloaded airplane, right? Under those circumstances, might you interpret a hard nose slice as an unload? Thinking that you just might be unloaded, could you then release the control stick to grab the ejection handle? Indecision could be fatal.

Making good decisions under stress defines leadership. Generally, accidents befall wingmen. Leaders must communicate experience to their wingmen to keep them alive and effective. To fly and to survive, you have to know how to react to stress. Much of courage - Hemingway's "grace under pressure" - comes from preparation, from knowing what to expect, from having done it before. An aircraft that is out of control at low altitude is something hardly anybody experiences, ever. You can't have been there; you can't know in advance how you will react to that situation. There will be no time to make slow, careful, deliberate decisions if you are faced with that or a similar dilemma. Where you can, make all the little decisions beforehand, and have a good idea where you want to go with your big decision.

Deciding to jettison your airplane is about as easy as deciding to get divorced. When your airplane is clearly unfaithful, your course of action is obvious ... not easy, but you know what you have to do. When facing a situation that is unexpected and alien, most people want to back off and look it over again. The unforgiving thing about airplanes is, they often don't give you the time to take a second look.

I always used to brief my backseater, "Open the command selector valve for takeoff and landing. Any other time, I'll eject myself if we have to go." Now, my briefing includes instructions to keep the command selector open the entire flight, and details on when I want the backseater to eject both of us.

Our flight briefing the day of the accident included some good arguments for having the backseater initiate ejection. First was the fact that if your airplane goes out of control, you will be more preoccupied with getting it back in control than with watching the altimeter. Second was the theory that the backseater is less, well, loyal to the airplane. If it is the frontseater who has caused the emergency, the backseater may well be more aware of the proximity of the ground and less worried about the consequences of flying the bird into a "CAUSE: Pilot Error" accident. Third, just like increasing probability of kill with two weapons instead of one, you increase probability of life by having two people who could decide to eject when things turn brown.

Skeptics will say, "I'm not trusting that guy with my wings," and go on flying without giving their backseaters a chance to save two lives instead of one. Even an inexperienced WSO has no desire to eject without good reason. Ejection is painful. It is more frightening than your first foul in low-angle bomb. It causes much time to be wasted with accident boards. You are carried to the hospital where they cut your clothes off and spend hours X-raying you, sampling your blood and urine. The point is that nobody will eject unless there is something really wrong with the airplane.

My backseater knows that in the event of a serious emergency, my hands will be full of controls, that I will do all I can do to save that airplane. He knows that if I can't save the aircraft, it is part of his crew duty to initiate the ejection - preferably on my command. If I haven't commanded and it's time to go, he is the only man in the world who can save my life. Your backseater might one day save your life...if you give him the chance. Keep those command ejection selector valves open, folks, it's cheap life insurance.

TAC SAFETY AWARDS

Ground Safety Award of the Quarter

2Lt Winfield S. Arnott

Second Lieutenant Winfield S. Arnott, 73d Tactical Control Flight, 507th Tactical Air Control Wing, Shaw Air Force Base, South Carolina, has been selected to receive the Tactical Air Command Ground Safety Award for the third quarter 1976. Lieutenant Arnott will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

Maintenance Safety Award

Sgt Eugene M. Hill

A1C Richard S. Myers

Sergeant Eugene M. Hill and Airman First Class Richard S. Myers, 474th Organizational Maintenance Squadron, 474th Tactical Fighter Wing, Nellis Air Force Base, Nevada, have been selected to receive the Tactical Air Command Maintenance Safety Award for this month. Sergeant Hill and Airman Myers will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

Crew Chief Safety Award

Sgt Donald J. Ford

Amn John W. Spano

Sergeant Donald J. Ford and Airman John W. Spano, 33d Organizational Maintenance Squadron, 33d Tactical Fighter Wing, Eglin Air Force Base, Florida, have been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Sergeant Ford and Airman Spano will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

WHAT'S A JETHRO PUGH?

By Capt Rich Buickerood
HQ TAC/Plans, Systems Management

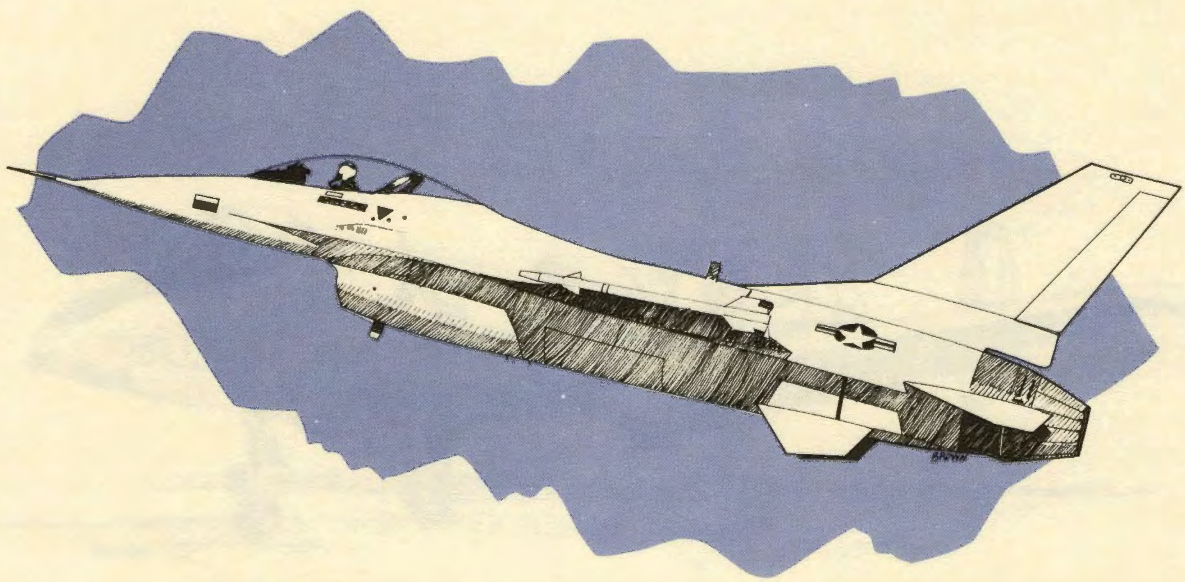
When you saw that headline several years ago, did you think it was a new aerial maneuver perfected by the North Vietnamese? How about your first night at the club as a second balloon. Did you reach for the can of Raid when some grizzled old captain yelled, "Dead bug"? Can you remember back to flying training or RTU when you tried and tried to put on a G-suit for the first time? New experiences, terms, and concepts are constantly appearing on our horizons. New ways of doing business (in regard to management) are evolving throughout the Air Force. Such is the case at HQ TAC. People can be heard muttering as they walk down the corridors: "A PRO. What's that?" "A SMO?" "A Phasing Group?"

All of these terms represent management organization to help TAC through the most dynamic period in its history - a 5-year period when two-thirds of the present aircraft inventory will be replaced by the F-16, F-15, A-10, and AWACS. As jocks and gators we might be tempted to concern ourselves only with jumping into one of the cockpits, but the men with the stars have to think about the big expensive questions: Internal or external ECM? Air-to-air or air-to-mud? Podunk or Bumfug AB? Sortie lengths and sortie rates. Cost overruns. Split R&D costs - on and on go the tough questions. Someone has to tie it all together for the man in charge.

What is TAC doing? Our answer has been to establish three groups to manage new weapons systems and operational programs: The Phasing Group, the Program Review Organization (PRO), and a Systems Management Office (SMO). A Phasing Group, chaired by the TAC Vice Commander, is a high-powered group of generals and colonels who look at overall program progress and apply their years of experience in operations, maintenance, supply, etc., toward solving problems which might keep TAC from reaching program objectives. All TAC Deputy Chiefs of Staff sit on the Phasing Group as well as representatives from the Air Staff (if available), the tactical air forces (if concerned), subordinate commands (if tasked), and other responsible/interested agencies (e.g., participating contractors). When hot items are brought before the Phasing Group, the Vice Commander expects answers: How did we get where we are? What are the options? Which option do we pursue? What is the get-well date? Can we afford it? As a TAC action officer or as a representative from the respective AFSC weapon system SPO (System Program Office), getting through the Phasing Group unscathed is as impossible as going "downtown" in a Cessna 172 and surviving!

We all know general officers need facts compiled by majors, captains and sergeants to help them make the right decisions. So it is with a Phasing Group. Rather than have all that high-powered help running around without direction, Program Review Organizations have been formed to support the Phasing Groups. Each of 22 hottest major systems acquisition programs, ranging from drones to advanced tankers, have been incorporated into respective PROs. These are interdisciplinary, permanently formed, working groups (manned by the worker bees) which coordinate programming and acquisition activities across the TAC staff. The PRO chairman, with all functional staff agencies responsive to him, integrates/coordinates/directs all staff activities related to his assigned weapon system or program. His job is to worry about the program throughout the life cycle of the weapon system. For example, within logistics, we find the F-111D PRO chairman; within requirements, the F-4G Wild Weasel PRO chairman; and plans has within it, the Directorate of Systems Management (XPQ), whose director is the PRO chairman for the F-16, F-15, A-10, AWACS, and Foreign Military Sales (FMS) programs. Members of the PRO team are just that - pros from all functional areas who serve with the PRO chairman in trying to get the best product for TAC and the USAF.

Let's now look at some specific actions of a PRO. As shown, the management of all new large-scale weapons systems acquisition programs has been centralized in one staff organization. This deliberate move on the part of

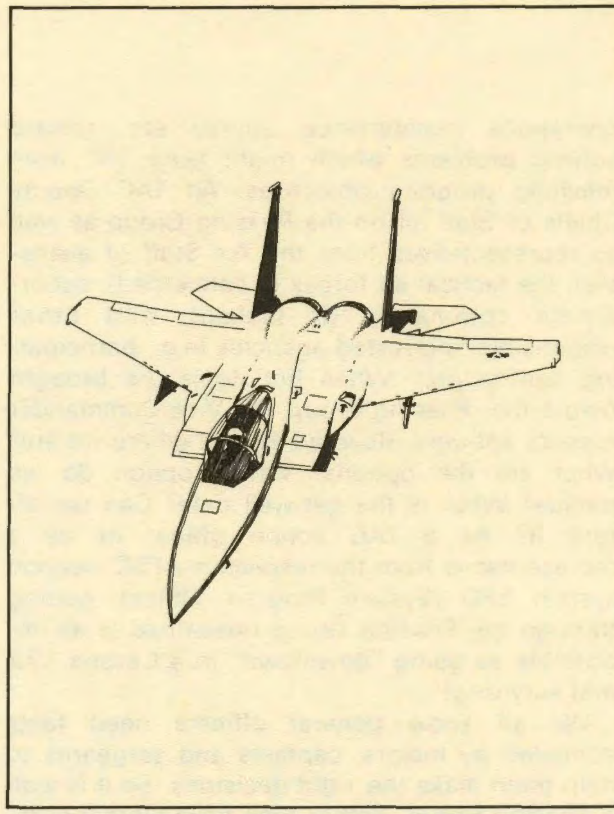


what's a jethro pugh?

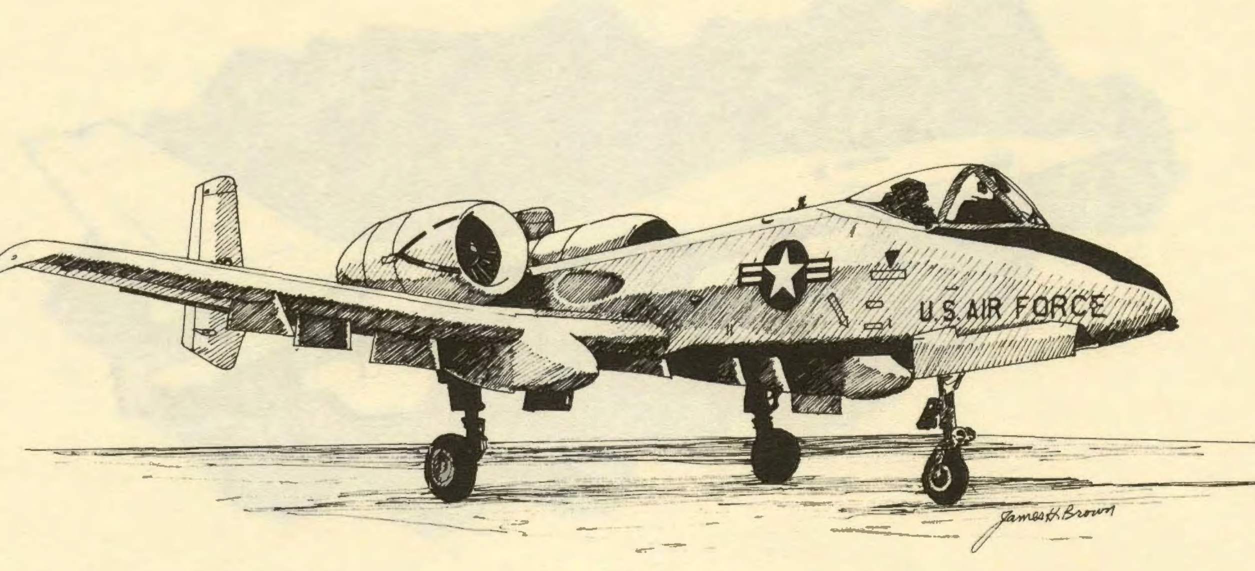
TAC's leaders will allow "lessons learned" to be continually applied; e.g., F-15 experiences can be applied to the F-16 program to preclude duplicating problems. The PRO team interfaces programming actions with HQ USAF and other commands; monitors overall systems status and provides an assessment to the Phasing Group; resolves existing and potential problems; evaluates system design...all of this to provide our boss with the facts about what we are doing with our dollars.

The third member of our management team is the SMO. Systems Management Offices are not part of HQ TAC but are temporarily established units (at Langley AFB) which serve as operating locations for the first operational wings destined to receive the new weapons systems (e.g., SMO-10 for the A-10).

In management lingo, the SMO members are primarily functional area experts (technologists) who work specific near-term problems associated with integrating the particular weapon system into the inventory. When the time arrives to start forming the first squadrons, the SMO people are scheduled to join the wing - the SMO is no longer.



Get the picture? We hope so because a lot of PROs and SMOs are working hard to manage the largest modernization program attempted by any tactical air force since WW II.The stakes are high and the possible rewards are great. The gauntlet is down, and TAC has accepted the challenge. ➤



TAC TIPS

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

To be great is to be misunderstood.
Ralph Waldo Emerson

OOPS!

By Capt David Greenlee
4 TFS, 388 TFW
Hill AFB, UT

We had it scheduled perfectly: Two F-4s to take off at 2030, sunset 2036, moonrise 2037, full moon. After all, you need to practice night flying by moonlight too. The mission looked good. We planned on three intercepts each, my wingie and I, with me doing the first intercept, a 180 snap-up, straight through. The radar was good, the ground controllers turned us in about when we figured they should, and even with a second-class GIB (an IP), the Fox ones would have nailed him.

From 30 degrees nose-high, I pushed over. We reached zero G. My second class GIB managed to grab almost everything that floated up in the cockpit. He caught my approach plate book, his checklist, and his FLIP stuff. In fact, the only thing that got by him was his flashlight.

It was a very nice flashlight, big enough for two D-cell batteries, metal, with a magnet on the switch so you could keep it handy under your dashboard. The big problem we had with it was that the thing landed in the vicinity of the rear canopy initiator, where bumps in the air or a hard landing might have caused us to lose something we'd rather have kept . . . like the aft canopy or the GIB.

We rejoined, pointed the sharp end toward home, and smoothly, very smoothly (Uh, did you remember to close the command selector valve?), let down. We made a soft touchdown, and were soon surrounded by red flashing lights.

Egress inspected us and cleared us to open the canopies after we had shut down. My second-class GIB (who is a first-rate instructor) began breathing again as we climbed gingerly down.

Back at the Ops counter, enjoying our bottles of diet soda, we reached some conclusions:

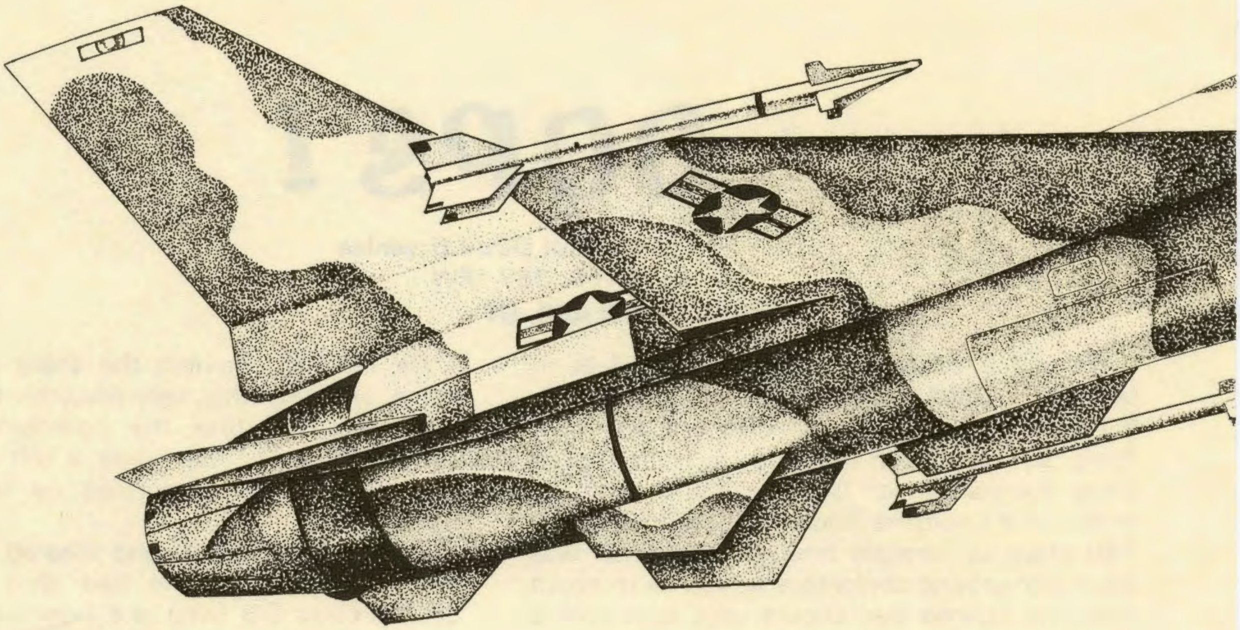
1. Since a flashlight is mandatory for night flying, some nimble aviator should invent a handy place to stick it. The rubber oxygen hose clamp on the map case works for some sizes, but where do you put a big one?

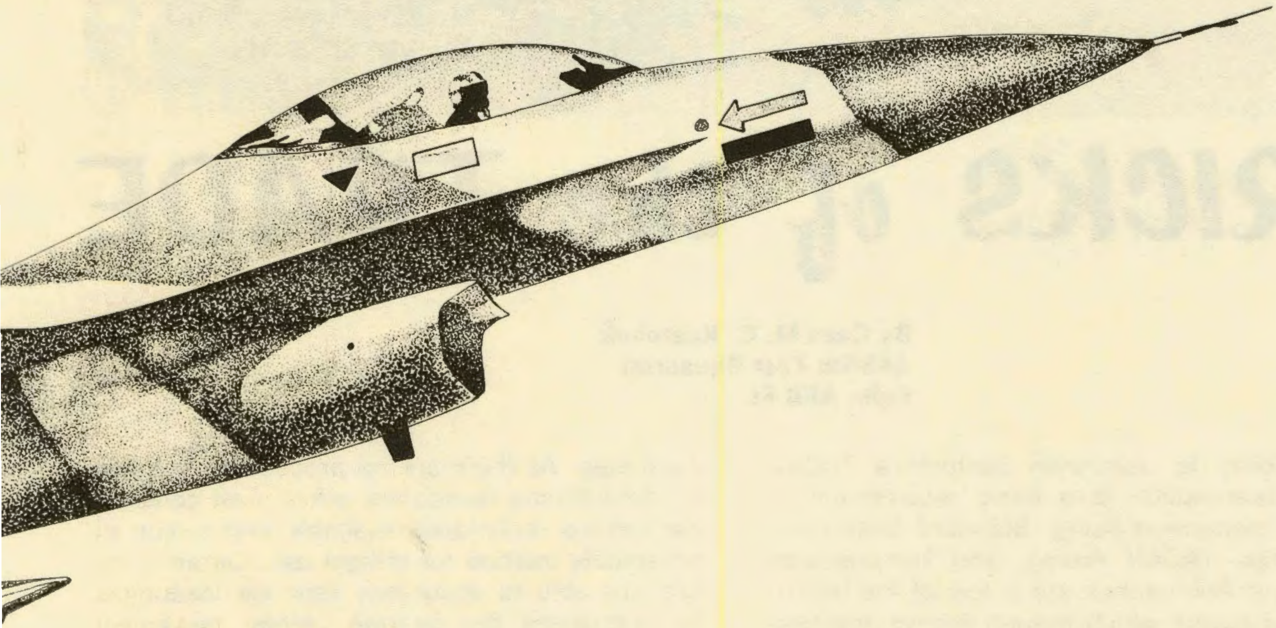
2. Flashlights that are designed to stick to your dashboard with magnets can get stuck embarrassing places in a cockpit.

3. Even if the mission looks smooth, everything loose ought to be tied on, strapped down, or left home.

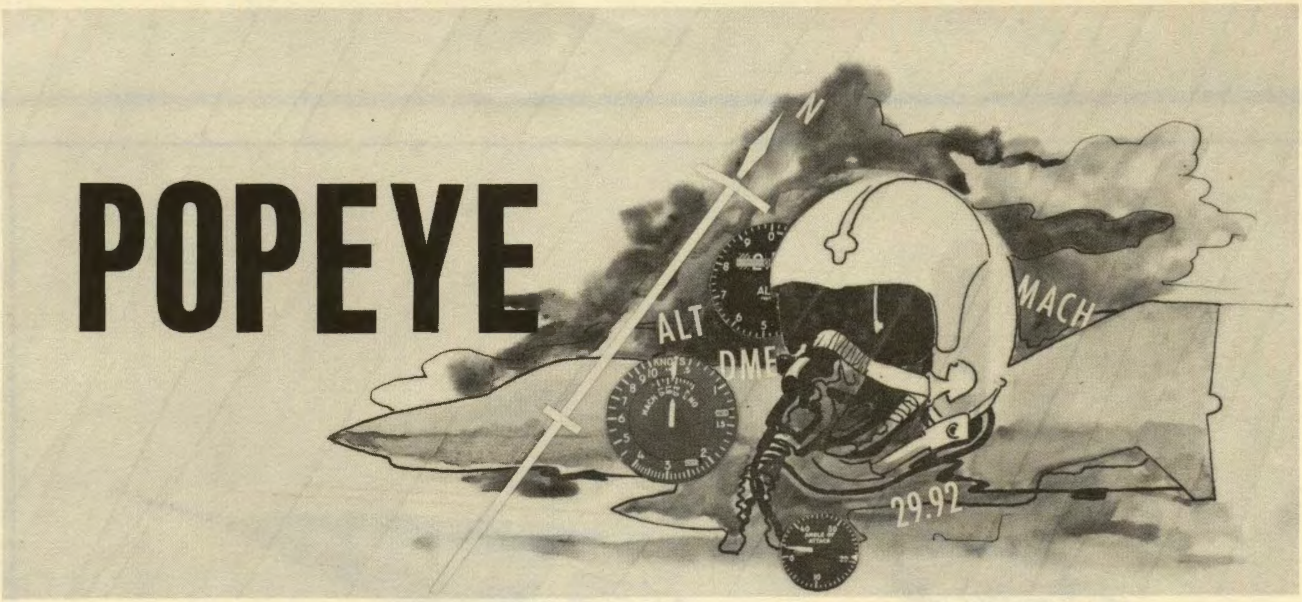
4. It was a lousy way to spend a perfect night for flying, but it could have been worse.

F-16





James H Brown



POPEYE TRICKS of the TRADE

By Capt M. C. Kostelnik
4485th Test Squadron
Eglin AFB FL

The ability to accurately perform a TACAN course interception is a basic requirement of modern instrument flying. Standard Instrument Departures, TACAN Arcing, and Nonprecision Instrument Approaches are a few of the instrument maneuvers which require course interception for successful completion. Although course interception is, in fact, a relatively simple maneuver, it is so integral with the more sophisticated instrument maneuvers that its importance to the pilot cannot be overemphasized. Instrument pilots interested in developing better techniques may begin by reviewing the applicable definitions and procedural steps contained in Instrument Flying, AFM 51-37. Intercept heading, angle of intercept, and rate of intercept are the variables affecting course interceptions which are adequately covered in the applicable chapter. Pilots following the procedural steps outlined in AFM 51-37 will normally arrive at an intercept heading which provides a satisfactory rate or angle of intercept. In order to complete the intercept, however, procedural steps advise the pilot to maintain the intercept heading until a leadpoint is reached ... then complete the intercept. The importance of proper leadpoint technique becomes apparent, as we discover that a leadpoint which allows for the turn radius of the aircraft must be determined as a procedural step. As there are no procedural methods for determining leadpoints, pilots must consider the various techniques available and select an acceptable method for inflight use. Certainly, pilots are able to accurately estimate leadpoints by comparing the bearing pointer movement with the time required to turn to course, based on previous inflight experience. Leadpoints are not intended to be an extra procedural burden on the pilot, but rather an aid for pilots with less experience to help judge the effects of turn radius and angle of intercept on TACAN course interception. Pilots interested in precision instrument flying may want to consider an IPIS type approach to leadpoint technique.

ANALYTICAL LEADPOINTS

In order to determine an effective leadpoint, three elements of information should be considered. The turn radius of the aircraft in nautical miles for the specific angle of bank and airspeed must be estimated. Secondly, since we want to read the leadpoint on a compass rose, we must convert the aircraft turn radius to degrees. Finally, we must adjust the leadpoint for the angle of intercept when it is other than 90°. We can, therefore, state the leadpoint formula as follows:

THE LEADPOINT FORMULA

LP = Leadpoint (Degrees)
TR = Turn Radius (Miles)
CF = Conversion Factor (Degrees/mile)
IF = Intercept Factor

LP = TR X CF X IF

TURN RADIUS

The turn radius of any aircraft is a function of the aircraft's true airspeed and angle of bank. Inflight estimates of turn radius can be divided into two major categories; those for 30° of bank and those for standard or half-standard rate turns. A list of the common techniques for inflight estimations of turn radius is provided below:

A. Turn radius for 30° angle of bank
1. (Indicated Mach - 2)
2. (Indicated Mach)^2
3. (Nautical Miles/Minute - 2) using TAS or ground speed

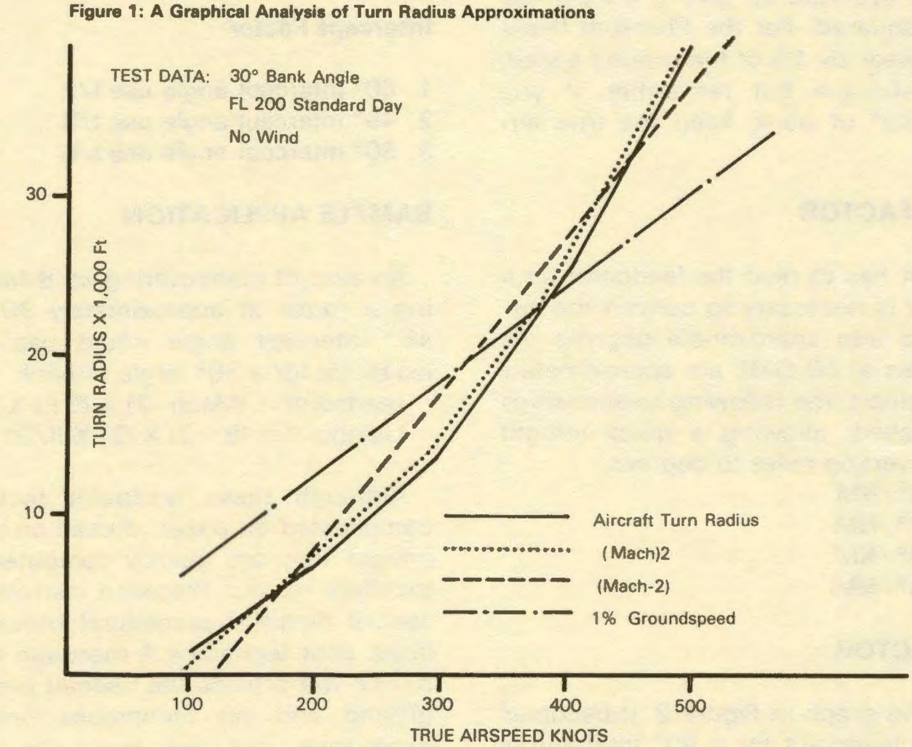
B. Turn radius for Rate Turns

1. 1% of ground speed for 1/2 standard rate turn (The bank angle for a 1/2 std rate turn = TAS/20+7)

2. 1/2% of ground speed for a standard rate turn (The bank angle for a std rate turn = TAS/10+7)

Refer to the graph in Figure 1 for the comparative accuracies of the techniques provided. Notice the accuracy of the Mach^2 technique - it very nearly approximates the actual turn radius curve. Although it is difficult to compute inflight, it is by far the most accurate technique. Mach-2 is probably the most convenient to compute but exhibits a high, though acceptable, degree of error. One percent of the ground speed is a very useful technique if the aircraft is equipped with a ground-speed indicator. Pilots who use the ground-speed technique must remember this method is only valid for an angle of bank which approximates a 1/2 standard rate turn, and is not necessarily applicable for a 30° bank turn. At high true airspeeds where 30° of bank approximates a 1/2 standard rate turn (420 Kts),

Figure 1: A Graphical Analysis of Turn Radius Approximations



tricks of the trade

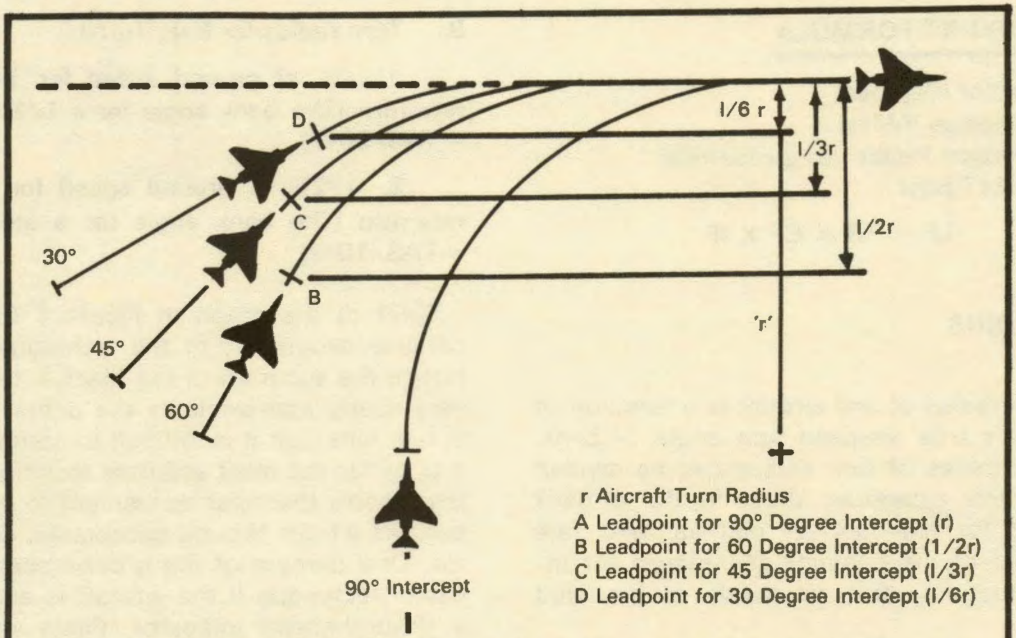


Figure 2: A Graphical Treatment of the Effect of Intercept Angle on Leadpoint

1% of the ground speed produces a useful leadpoint. All of the leadpoint techniques mentioned will provide satisfactory results, however, experience has shown that Mach-2 is the most convenient to compute and provides satisfactory results. Remember though, that Mach^2 is a great deal more accurate so give it a try if the Mach is easily squared. For the Phantom flyers who probably swear by 1% of the ground speed, it's a good technique but remember, if you intend to use 30° of bank, keep the true airspeed high.

CONVERSION FACTOR

Since the pilot has to read the leadpoint on a compass rose, it is necessary to convert the aircraft turn radius into approximate degrees. As the TACAN radials at 60 DME are approximately 1 nautical mile apart, the following relationships may be established, allowing a quick inflight conversion. Converting miles to degrees:

1. At 60 DME, 1°/NM
2. At 30 DME, 2°/NM
3. At 15 DME, 4°/NM
4. At 10 DME, 6°/NM

INTERCEPT FACTOR

Referring to the graph in Figure 2, it becomes evident that the leadpoint for a 90° intercept is actually just the turn radius (r) of the aircraft expressed in degrees. The graphical solution illustrated shows the need to reduce the leadpoint when the angle of intercept is less than 90°. The intercept factors shown below will provide satisfactory results for the angle of intercepts listed:

Intercept Factor

1. 60° intercept angle use l/2
2. 45° intercept angle use l/3
3. 30° intercept angle use l/6

SAMPLE APPLICATION

An aircraft maneuvering at .8 Mach, intercepting a radial at approximately 30 DME, with a 45° intercept angle could use the following leadpoint for a 30° angle of bank.

Leadpoint = (Mach -2) X (C F) X (I F)
Leadpoint = (8 - 2) X (2) X (l/3) = 4°

* * * *

Although these leadpoint techniques seem complicated on paper, if used on a regular basis inflight they are quickly computed and provide excellent results. Precision instrument flying is a special blend of procedural knowledge and inflight pilot technique. A thorough review of AFM 51-37 will provide the needed procedural background and yet techniques only come with experience and are truly the Tricks of the Instrument Pilot's Trade ....

PLACE THE FACE

This F-80 Shooting Star pilot just completed a close air support mission in Korea during October 1950.

It didn't take long for a response to our first "Place the Face" contest. Colonel Richard L. Meyer, Vice Commander of the 1st TFW, quickly and correctly identified the fighter pilot pictured in our December issue as Lieutenant General James D. Hughes, Commander, 12th AF. Colonel Meyer will receive the coveted Fleagle Fanny Feather of Fate Award.

This month brings the photo of another F-80 fighter jock of the past ... can you "place the face"? To give everyone an equal opportunity to win, we're allowing an extra month for responses. The winner will be announced in the March 1977 issue. Good luck!

PHYZ-BIZ

cold water immersion

By Lt Col Harold Andersen
HQ TAC Physiological Training Coordinator

Shakespeare said, "Winter tames man, woman, and beast." I'm sure that most aircrews are included in one category or another, and should realize that with the arrival of winter comes the dangers of the cold. For some, cold weather ushers in a season of fun and games: skating, skiing (and après ski), etc. Rarely do they contemplate the dangers posed by numbing, stupefying cold ... not the cold experienced by the well-clothed winter sportsman, who anticipates his exposure and prepares for it, but the cold of frigid waters which engulfs the downed airman, or the wind-blast and chill factor effects on the ejected airman.

There must be preparation in advance if survival in cold environments is to be successful. Of paramount importance in this preparation phase is the psychological and intellectual realization of the potential peril. Few people realize how quickly a human being can be completely incapacitated by cold air, and especially cold water. So, the first step in the preparation phase must be an appreciation of the risk - an understanding of the potentially lethal aspects of immersion in cold water or air. Hopefully, this article will provide a point of departure for aircrews to prepare themselves in advance for survival in the cold environment.

There are two considerations which should attract the interest of TAC aircrews: immersion in cold water following a successful ditching or ejection; and exposure to low air temperatures and high wind velocities following successful ejection over land. First, let's delve into the ramifications of immersion, and we'll save the consideration of cold air and high wind velocities until next month.

Figures 1 and 2 demonstrate the problem of survival in cold water. Note that in all instances (with or without anti-exposure suits, and voluntary exposure vs survival situation), tolerance to cold decreases markedly as water temperature decreases. From Figure 2, we can see that when the temperature of the water in which the unprotected (no anti-exposure suit) aircrewman is immersed drops below 70°F, the curve which shows the upper boundary of the "Safe Zone" is nearly perpendicular. At 68°-70°F water temperature, there is no problem with prolonged exposure. However, at 60°F, approximately 50% of those exposed will become unconscious in approximately 2 hours, and probably drown. One hour of survival time is about all that can be expected in 51°F water. For example, water temperatures in the Chesapeake Bay, near Langley AFB, Virginia, range from 43°-50°F during the months of December through February. For 50% of people exposed, time of consciousness at the lower end will be in the neighborhood of 20 to 30 minutes. Failure to rescue inside of

FIGURE 1 VOLONTARY TOLERANCE TO COLD WATER

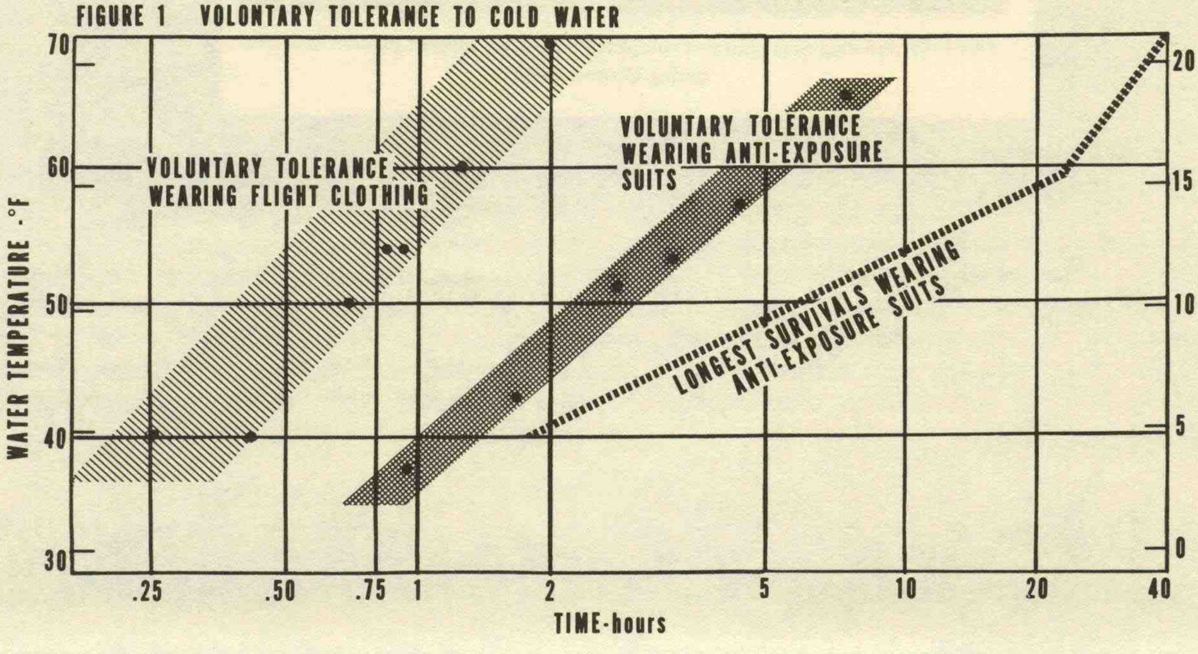
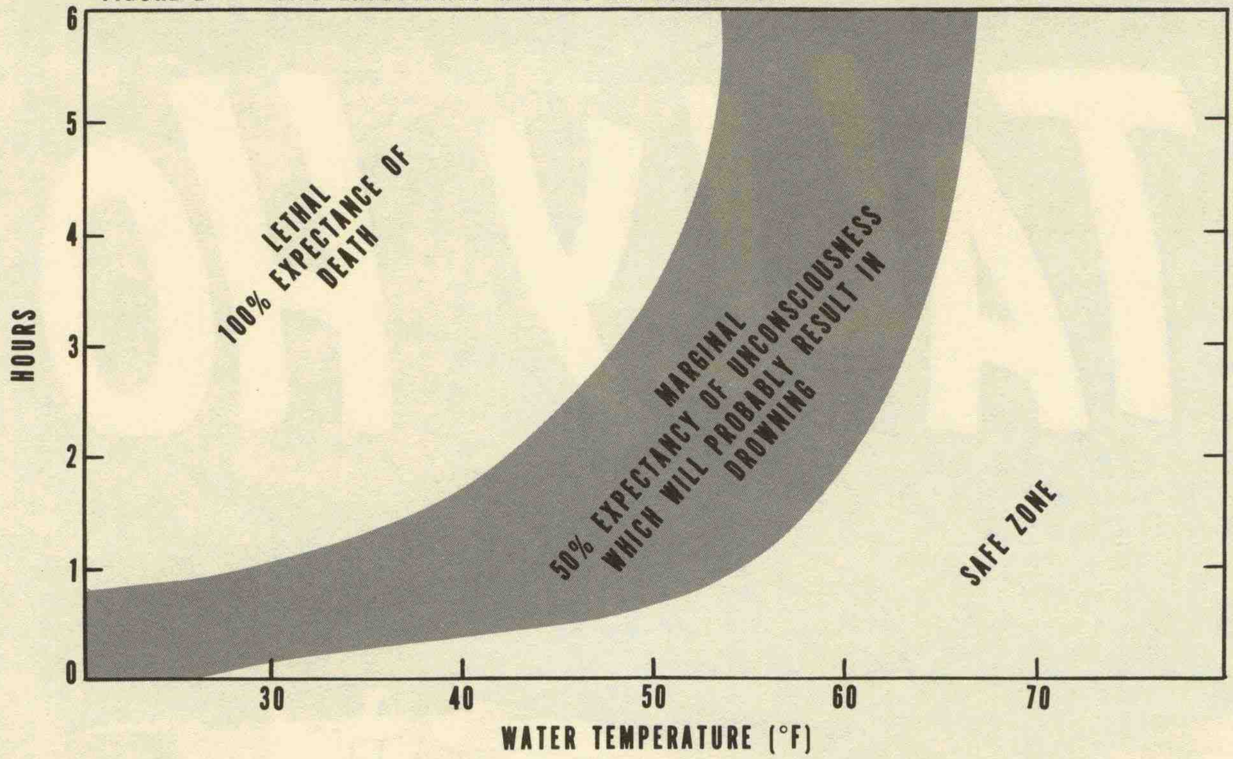
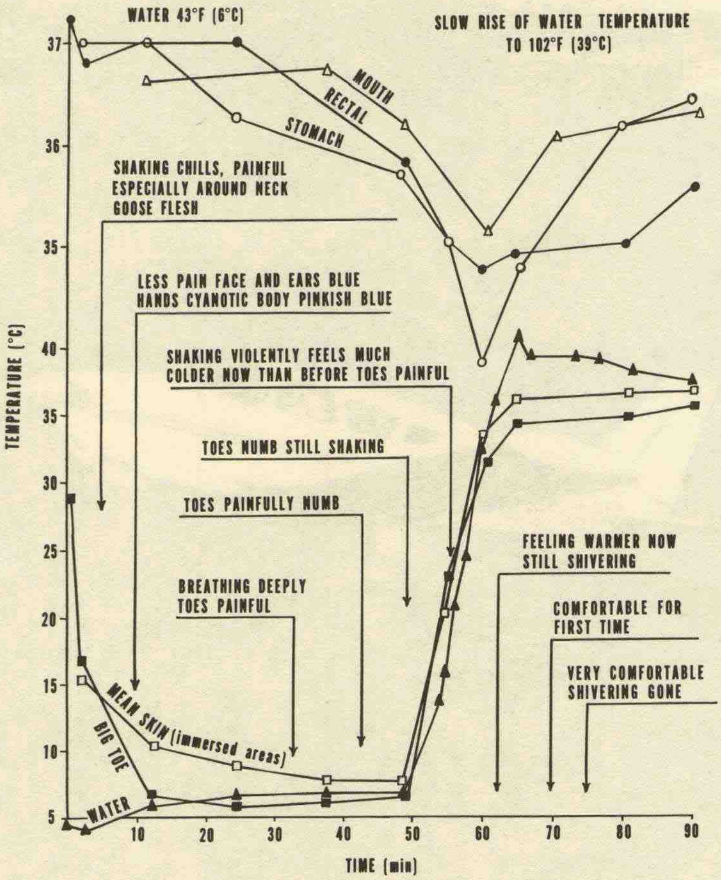


FIGURE 2 LIFE EXPECTANCY WITH NO EXPOSURE SUIT





that time interval could possibly result in a fatality.

Figure 3 shows the changes in body and skin temperature of an individual immersed in water at 43°F (6°C) for 52 minutes. The water was then warmed to 102°F (39°C). The sharp fall of stomach, mouth and rectal temperatures initially upon warming is probably due to the reopening of the peripheral circulation (arms and legs) and the introduction of chilled blood from those areas into the core of the body, which has been protected.

One thing to remember here: This was the response of only one individual, measured under controlled laboratory conditions. He wasn't concerned with fighting heavy seas to keep from drowning. His ability to tread water under these conditions was not tested. It is highly likely that the numbness, pain, and shaking would interfere with such purposeful activity ... perhaps prevent it completely.

Any way you slice it, survival without an anti-exposure suit would be chancy - a calculated risk which could be avoided. There's no substitute for your poopy suit. When the water temperature is 50°F (1°C) or less along any portion of your route of flight, wear your anti-exposure coveralls ... don't take a chance.

* * *

Next month - wind chill.

TALLY HO

By Col Sam Johnson
Commander, 31st TFW
Homestead AFB, FL

"Tally Ho, 30 left, 5 low!" That's a common call in a fighter formation. We train our pilots to look around to spot that bandit; but, in today's radar environment, how often do we look around while we use IFR in VMC conditions? How many bogies have we failed to see until the last second? VFR means see and be seen. It is our responsibility as Air Force members, aircrews and supervisors alike, to protect our capability ... to train and maintain our readiness. This includes proving to the FAA and civilian aviation that we can operate high performance military aircraft safely in today's crowded skies.

Recently, we took a critical look at every minute detail of our flying operations - routes, climbouts, descents, radar-control, light aircraft patterns, and interface between ARTCCs and the military.

We relearned some old lessons. Not that long ago, we lived in a total VFR condition. Radio was about the only control. Our procedures included clearing turns during descents and around busy airfields. Looking around was a way of life.

Today, we have come to rely too much on radar. Our ATC and TAC training programs are not geared for VFR operations, except in combat. We have acquired a "commercial airliner" syndrome ... straight ahead descents under radar control or with radar advisories. Safe? NOT BY A LONG SHOT when you are in VMC conditions.

General aviation aircraft can, and do, fly without filing flight plans, and they fly wherever they want to. Manufacturers are selling the light plane buff on the advantages of pressurized cabins, smooth air at higher levels and VFR flight over the clouds. They are not permitted to fly above 18,000 feet without an IFR flight plan because that is the regime of positive controlled airspace, but there are ever-increasing numbers of general aviation aircraft above 10,000 feet.

As a fighter pilot, I used to think I was safe from the bugsmashers above 10,000 feet, but no more. Believe it or not, accidents have occurred involving pressurized light aircraft, without flight plans, in VMC above 10,000 feet MSL.

An important lesson was learned here. We need to do more visual clearing at all altitudes. For instance, Centers do not always see aircraft when they are squawking VFR codes on their transponders. This can happen when the controller is working what is called a "manual" scope ... i.e., when the controller interprets the radar scope display himself.

A little background here is appropriate. If the controller is working a manual scope, he is seeing raw radar returns and interpreting them himself. If he is working with the computer, he gets vital information like call sign, aircraft type, and altitude on each flight under IFR control. There is also a warning circuit in the computer which sets off an alarm when any track gets closer than 10 miles or 500 feet of any IFR track.

This collision warning is available, but you have to be squawking while under control of ARTCC. That is, your code must be entered into the computer by the controller. The controller also has the capability of inserting VFR codes into the computer; but he normally does not, and is not required to do so. Jacksonville Center is currently running tests on VFR control of light traffic ... but this is only with aircraft on a flight plan. All Centers are manpower-limited, so it may be a very long time until we get the capability nationwide. The point is that if your flight is in the computer, you will be provided collision warning even with VFR traffic ... if that traffic is squawking a VFR code and is entered in the computer.

Our base now has an assigned code for all local flying which is used for both the IFR and VFR portions of a flight. We are in the computer all the time. Are you? When the Center asks you to squawk VFR, tell them you would like to maintain your present squawk and receive radar advisories. The ARTCC controller will provide this additional service on a workload-permitting basis. This improves your odds ... but it does not relieve you of the responsibility for clearing under VFR conditions. Look around and use all available aids.

When I mentioned the straight-ahead syndrome, you probably told yourself, "I do let down straight ahead ... but I'm always clearing in front." Well, I'm familiar with the F-4, and I don't think it's too different from most fighters. You cannot see much in front of you. In a descent, you can get into a position where the

TALLY HO

geometry is such that you will never see a slower aircraft that is below you. You can let down on him if he is anywhere close to your flight path. This can jeopardize an entire flight that is flying in close or route formation.

The nose of the F-4 is rather large and visibility is restricted under the nose in a 70-degree cone. To see and clear directly in front and below the nose, you must roll the aircraft between 35-40 degrees. That's a lot of bank angle for airline pilots and even quite a bit for a fighter pilot with a formation.

Sitting normally in the cockpit, the average jock can see about 35 degrees over the side, and if he strains, maybe 55 degrees. The back seat is worse! What I am saying is that you cannot see in front of your aircraft and certainly not in a descent. What about straight ahead? In the

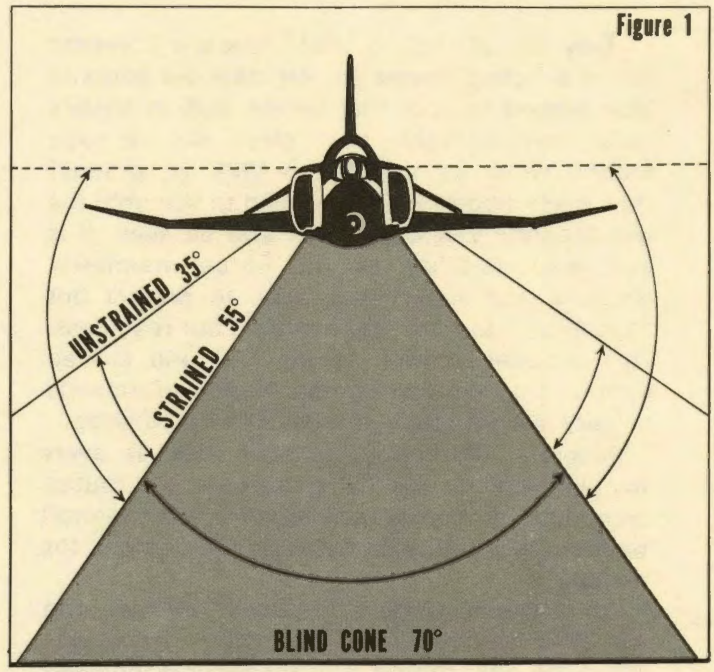
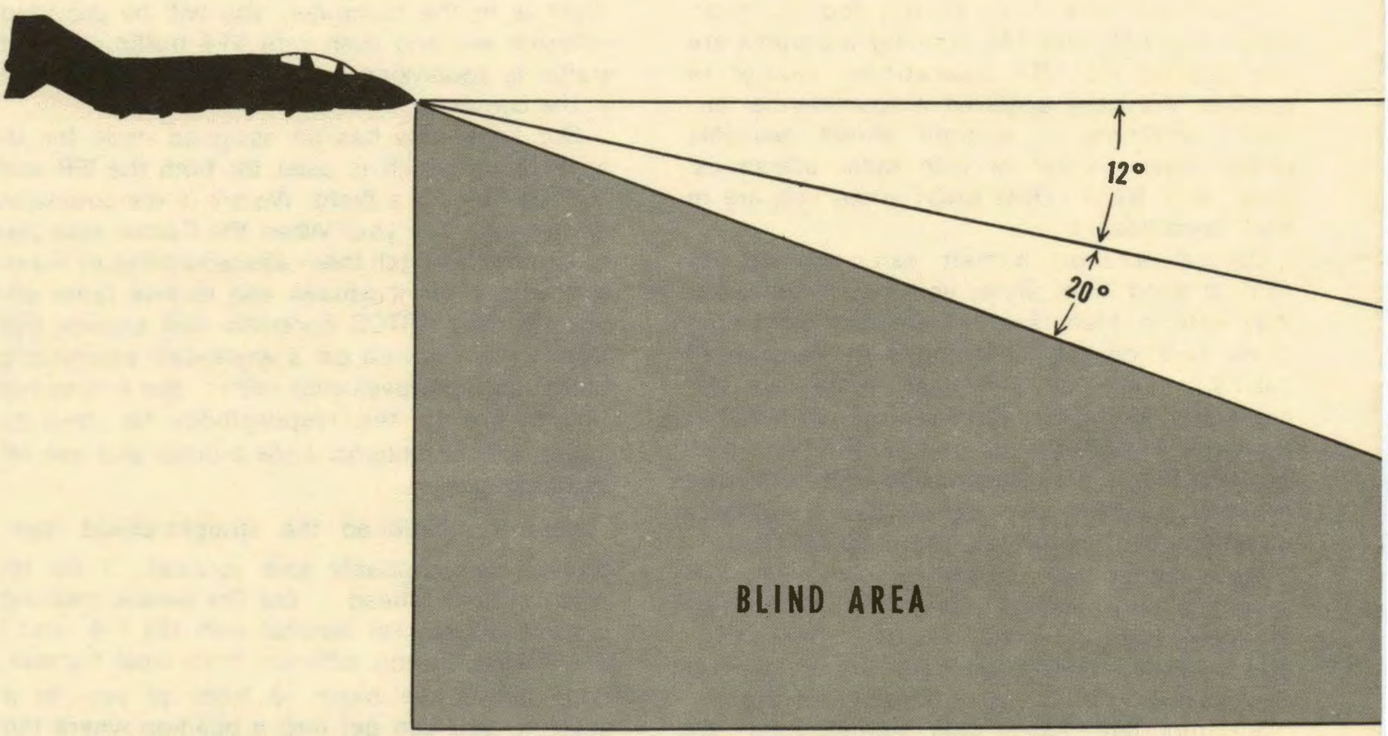


Figure 1



F-4, you can strain and see 20 degrees straight out over the nose. Sitting normally, you see about 10-12 degrees. And that's BLIND! Banking and clearing turns are a must. Emphasize VFR clearing. Fighter pilots, look around!

What about formation? Close formation is a must for cloud penetration. But, in VMC conditions (and this includes times when you are on an IFR clearance), your formation should be spread for clearing ahead. This is especially important during descent and entry into an airport control zone. The formation should be one that best suits your special conditions, but route formation will not do it. Your wingman needs about 300-500 feet to achieve full coverage under the nose of the lead aircraft. Good cross coverage should be emphasized to pick up bogies with a slight crossing angle. For example, we have found that descent into the range area requires the flight lead to maneuver to avoid puffy clouds and to clear; so we are using a staggered trail formation to give the lead full freedom. But generally, a tactical spread or some variation of it will do the job.

Again, we have been lulled into a false sense of security by radar; and flight rules make route formation the easiest way to accommodate ARTCC. (Route also gives us an easier rejoin to close formation in the event of cloud penetration.) But flying fighters never was supposed to be easy, and any good fighter pilot should be able to hack it. Loosen it up and look around.

As for supervisors, we are remiss if we don't take a critical look at every phase of our flying operation from takeoff to landing. The airspace around us is becoming more crowded. Our ground control environment is playing catch-up. We lack UHF communication and full radar coverage. The economics of the problem will prevent any magic solution, but the Centers can help you. Talk to them personally: orient them with the TAC mission; fly with them; and work out common problems.

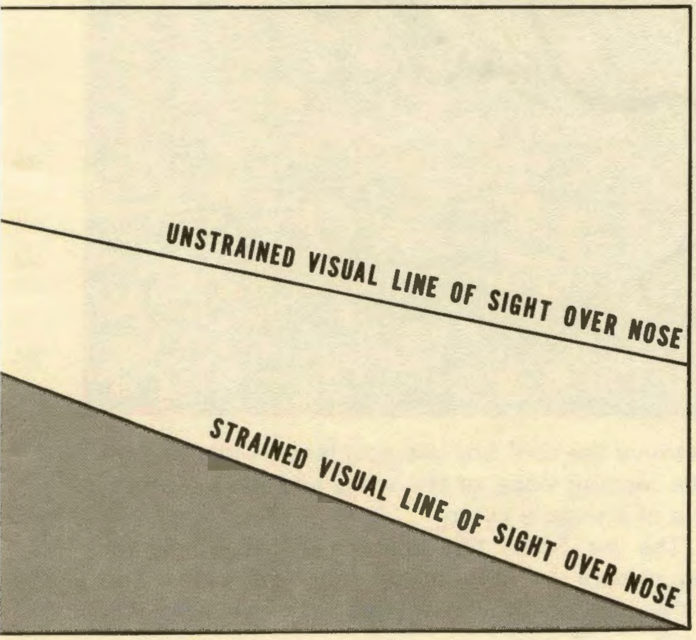
We have much better procedures now. Some of the questions which were addressed were: Should we join up or stay loose after takeoff? Can we remain IFR on low-level routes? Is an IFR descent to the air-to-ground range right down to the spacer pass feasible? Should flight formation be called to the range control to reduce communication and head-in-the-cockpit time? Should loose formation be flown to initial approach? Should route profiles be changed? Should we stay above 12,500 feet, where IFF is mandatory, as much as possible? Can commercial traffic be restricted?

There were many other questions, and each question begs many more. But you'll find the Center is ready to help. In addition, we must stay alert for changes in traffic flow and new hazards. You can make positive changes. Look around all the time and everywhere.

Maybe I haven't said anything new. But I hope I have renewed your awareness of the hazards in VMC conditions whether under IFR control or not. The ARTCCs can help us with their computer systems, and you should use their collision warning capability. The right formation is important and, as we have seen, route just will not hack it. But the ultimate answer is clearing and looking around. This boils it down to aircrew responsibility. The flight lead is not the only one responsible for clearing the flight, it takes every pair of eyeballs to avoid a midair. Review lookout doctrine in TACM 3-1. If it'll work for spotting a bandit ... it'll help you find that bugsmasher.

We must avoid another collision. Let's all LOOK AROUND: "Tally Ho ... Bogie In Sight."

Figure 2



chock talk

...incidents and

ouch!

An airman was nearly emasculated because he didn't take the time to position an available NF-2 light cart. He had been dispatched during the night to perform some routine maintenance. After placing his tool box on the aircraft's wing, the airman climbed the aircraft ladder and began walking across the unlighted wing to retrieve the tool box. He accidentally stepped off the leading edge of the wing and landed straddle of a missile pylon.

The Air Force has spent a lot of money for equipment to help make your job easier and safer. It's up to you to use it. It can save you time ... and pain.

incidentals with a maintenance slant.

BLOWN CANOPY

A recent explosives accident revealed complacency on the part of both an aircrew and a transient alert worker. Although no serious aircraft damage resulted, the mishap cost Uncle Sam $1,324 ... money we can't afford to waste. This is what happened ....

The RF-4 landed at an enroute base for servicing. The pilot taxied in, dragging the drag chute behind the aircraft, and shut down the engines without releasing the drag chute. The pilot and WSO installed their face curtain pins, unstrapped, left the aircraft, and headed for Base Operations to update their flight plan.

Transient alert personnel refueled the aircraft and then attempted to remove the drag chute. After the second unsuccessful attempt, the transient alert worker reached inside the drag chute compartment to trip the drag chute release. When this failed, he noted that the pilot had left the release handle in the locked position. He then climbed the boarding ladder and reached inside the cockpit. Instead of grabbing the drag chute handle, he actuated the canopy jettison handle ... the jettison system functioned as designed.

The pilot's error in this accident was that he failed to complete his "After Landing Check" by not jettisoning his drag chute and then he just walked away from the aircraft. The first error the transient alert worker made was not having the proper tool to remove the drag chute without having to use the drag chute handle in the cockpit. How could someone mistake a canopy jettison handle for a drag chute handle? In most aircraft, the drag chute handle is located on the left side of the front cockpit instrument panel ... near where the canopy jettison handle is located in the F-4. However, this transient alert worker was complacent because he didn't take the time to check the Tech Data and ensure he was using the proper handle.

Don't get complacent. Follow Tech Data and make sure the job is done right. If you're not sure of what you're doing, stop right there and get assistance. You may save yourself embarrassment or save your life.

THE SURVIVAL KIT BOOM...CONTINUES

Two life support technicians were dispatched to remove the parachute and survival kit from an A-7. Prior to removing the arming cable from its secured position, one of the technicians noticed the arming lanyard was partially pulled, and the terminal end cap had been pulled loose from the end of the cable housing. The swaged ball was still inserted in the harness release handle. The technician decided to put the terminal end cap back on the cable housing before he removed the parachute and survival kit. To do this, the cable had to be removed from the spring clip. When the technician pulled up on the cable to free it from the spring clip, just enough pressure was applied to the arming lanyard to fire the MK-5 MOD 2 cartridge.

If you work near survival kits and notice anything unusual, don't try to fix it yourself. Notify maintenance control to have someone from life support or egress come and check it out. Survival kits are extremely reliable items. If the arming lanyard is pulled ... it'll work álmost every time.

FLEAGLEGRAM

RESPONSES FROM THE FRONT

Dear Fleagle

Here is a picture of an F-105 drag chute that found its way to our base by way of a returning cross country aircraft. Risers were broken, panels shredded, and there was no documentation to identify the base that supplied the chute. It was wrapped up and placed in the aircraft travel pod.

This is not an isolated case. During a recent 2-month period, we had aircraft return from cross country flights with five unserviceable drag chutes. It is highly probable that an unserviceable drag chute will be repacked, installed in an aircraft, then fail during deployment. That failure could occur on a wet runway, slight tail wind, etc, with predictable results.

Our own policy is to send extra drag chutes (serviceable) with cross country aircraft and for the pilot to supervise the drag chute installation or install it himself. Deployed drag chutes are generally returned to home station for repack. Any drag chutes returning packed are unpacked, inspected, then repacked, if serviceable. (Transient facilities will probably complain that units dump bad drag chutes on them when away from home station.)

My gripe is without a recommendation. In the past, we have called transient facilities informing them that drag chutes had been improperly installed or unserviceable ones supplied by their station - usually with very courteous replies. The standard "rebriefing of personnel" or "emphasis on the use of Tech Data" is a questionable solution.

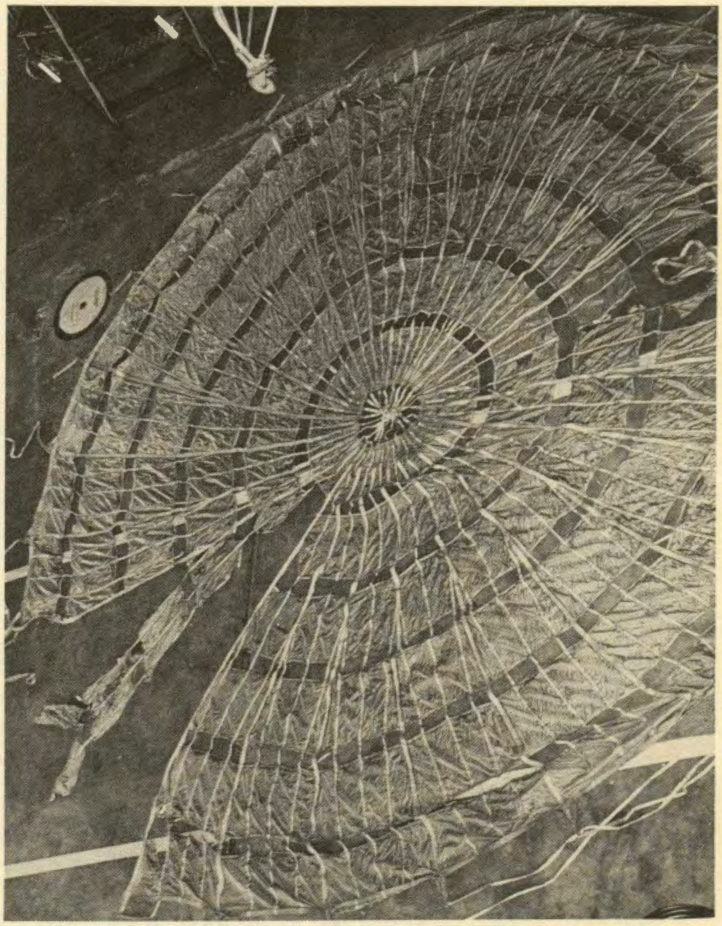
To me, the problem is attitude and maybe the product itself. If the drag chutes are, in fact, less durable than they used to be, the guys in the field can flag that part of the problem through the various deficiency reporting channels available. The most disturbing part of the problem is attitude - care enough to do a "professional" job. If I knew how to change attitudes, then I would have a recommendation. Where has all the teamwork gone?

Capt William C. Jones
192d TFG VA ANG
Byrd Field, VA

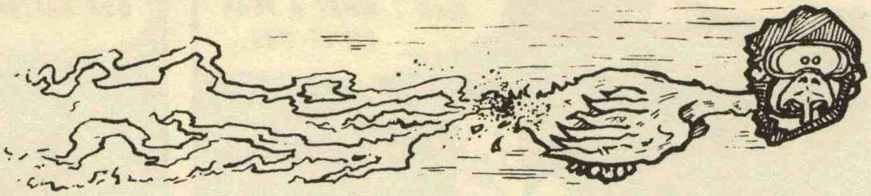
Bill

Right on! As well as an attitude problem, anyone packing an unserviceable drag bag in a fighter is risking an aircraft and its crew. We've all got to pull togehter as a team if we're going to get the job done.

Fleagle



TAC TALLY



	TAC Nov	TAC thru Nov 1976	TAC thru Nov 1975	ANG Nov	ANG thru Nov 1976	ANG thru Nov 1975	AFR Nov	AFR thru Nov 1976	AFR thru Nov 1975
TOTAL ACFT. ACCIDENTS ►	4	32	27	1	10	16	0	3	0
MAJOR ACFT. ACCIDENTS ►	4	30	25	1	9	13	0	2	0
AIRCREW FATALITIES ►	4	15	20	1	5	7	0	1	0
TOTAL EJECTIONS ►	2	25	17	0	5	7	0	1	0
SUCCESSFUL EJECTIONS ►	1	18	12	0	5	6	0	0	0

TAC'S TOP "5"

TAC FTR/RECCE accident free months	
14	347 TFW
13	4 TFW
11	1 TFW
8	366 TFW
7	474 TFW

ARF FTR/RECCE accident free months	
56	127 TFW
24	132 TFW
22	156 TFG
17	122 TFW
17	117 TRW

TAC/ARF Other Units accident free months		
112	182 TASG	ANG
92	135 TASG	ANG
84	507 TAIRCW	TAC
81	193 TEWG	ANG
79	602 TAIRCW	TAC

MAJOR ACCIDENT COMPARISON RATE 75/76
(BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	75	7.9	5.4	3.6	2.6	3.1	3.5	5.3	6.4	6.0	6.6	6.3	6.1
	76	2.9	8.6	9.0	7.3	8.0	8.1	6.9	6.8	7.5	8.1	7.3	
ANG	75	5.3	2.8	5.3	3.7	4.7	6.8	5.8	5.1	5.1	5.5	5.4	5.4
	76	10.5	5.0	6.5	4.8	3.8	3.9	3.3	3.5	3.7	3.9	4.0	
AFRES	75	0	0	0	0	0	0	0	0	0	0	0	4.9
	76	0	0	11.3	8.1	6.1	4.9	4.1	7.2	6.3	5.7	5.3	

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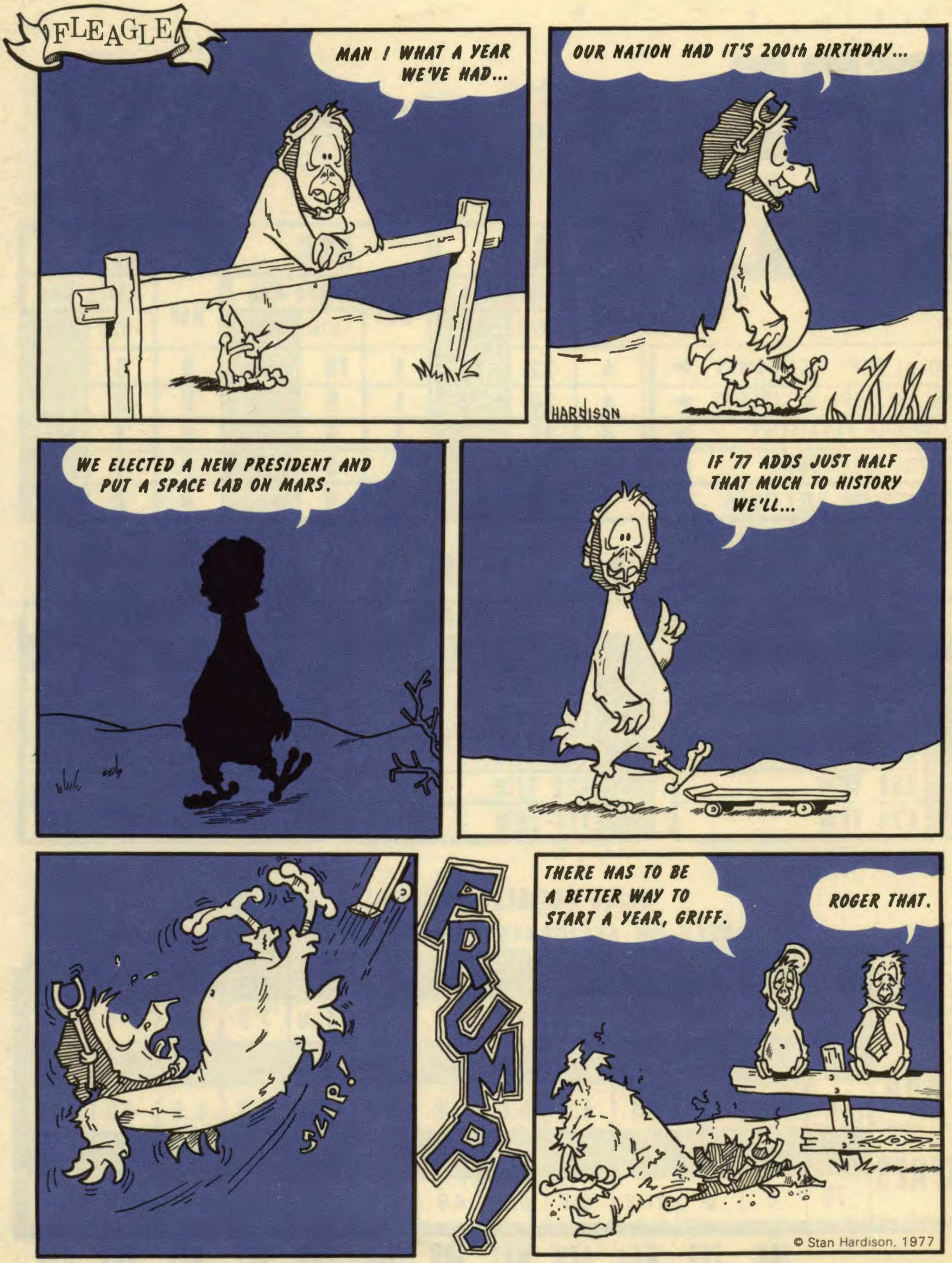
FLEAGLE
MAN ! WHAT A YEAR WE'VE HAD...
OUR NATION HAD IT'S 200th BIRTHDAY...
HARDISON
WE ELECTED A NEW PRESIDENT AND PUT A SPACE LAB ON MARS.
IF '77 ADDS JUST HALF THAT MUCH TO HISTORY WE'LL...
SLIP!
FRUMP!
THERE HAS TO BE A BETTER WAY TO START A YEAR, GRIFF.
ROGER THAT.
© Stan Hardison, 1977