TAC ATTACK

MARCH 1977

PHOTIC
STIMULATION Pg 4

TAC ATTACK MARCH 1977 VOLUME 17 NUMBER 3

FOR EFFICIENT TACTICAL AIR POWER

FEATURES

DEPARTMENTS

TACRP 127-1

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Angle of ATTACK

. . . AND NOW FOR THE GOOD NEWS

For the past few months, we have been dwelling on our past failures ... the high number of aircraft destroyed during 1976, the high cost of Foreign Object Damage (FOD), and the high percentage of aircrews who either failed to eject or ejected too late from out-of-control aircraft. This month, I would like to be more positive ... to bring you the good news.

TAC aircrews flew 288,707 sorties in 18 different types of aircraft. New exercises designed to provide aircrews with realistic training, in an environment as close to actual combat as possible, have tested both flyers and maintainers alike. TAC aircrews and maintenance personnel reacted to an international crisis with the speed of light, bringing praises from high levels. In the most massive, complex and compressed peacetime tactical air operation ever conducted in the United States, TAC aircrews flew 414 aircraft in a mock air battle in support of an AWACS test - without a single incident. The list of accomplishments goes on. Unfortunately, we often neglect to praise the crew chiefs, weapons loaders, and aircrews who contributed so much to making TAC the dynamic force it is.

Last year, TAC aircrews and maintenance personnel prevented the loss or damage of at least 45 aircraft. This fact is confirmed by the Safety Award nominations received each month. While it is difficult, if not impossible, to determine the exact number of "saves," I am convinced there were many more TAC individuals who prevented the loss of lives and materiel through their actions. These people, who are the overwhelming majority, accepted the challenge - and met it. Well done!

George M. Sauls

GEORGE M. SAULS, Colonel, USAF
Chief of Safety

Photic Stimulation

By Maj Earl L. Robertson
HQ TAC Flight Safety

The full moon made the night seem like day. Below, I could see the shadow of our F-111F gliding across the snow. The flash of the bottom strobe reflecting on the snow blocked out the shadow with monotonous regularity. What had started off as a bad luck mission was now going well. The One-Eleven is designed for black box repair, and our wing had perfected before-takeoff repairs to a science. Maintenance had replaced what seemed like every magic box in the airplane; the last just before takeoff. We lifted off just before the 2-hour abort time ... our 2200 land time was now 2400. Sometimes I wish those maintenance guys weren't so damned efficient.

We were in the weather right after takeoff and broke out just in time to complete the airborne Terrain Following Radar (TFR) checks before an auto TF letdown. An auto letdown to a thousand feet can be very interesting on a dark night. Tonight, however, the full moon reflecting on the snow created enough light so that the descent had been visual all the way. Descent was perfect and the fly-up checks had been completed without any problems.

We had been low-level for about 20 minutes, and I was enjoying the view as our bird worked its way up and down the northern Nevada mountain slopes. My right-seater called out a mountain at 8 miles, and I answered with a confirmation from the TFR scope. The information nd procedures flowed smoothly and easily. Ken and I worked hard at our job; and, even though no one else could know how well we worked together, it was worth the effort. The snow on the mountains was beautiful. We got light in the seat as our plane nosed over the top of a mountain and swept into the valley that led to our target ... "Whispering Death," an apropos name.

Ken's words suddenly disturbed my thoughts. "What do you think about that overcast ahead?" Slightly startled, I took a quick look at the weather. We were over level ground now, and the clouds didn't look like they were too low to prevent staying VFR. As we approached the weather, I could see the top strobe start to reflect off the overcast. I had heard some of the jocks complain about the strobes in haze and clouds. They hadn't bothered me much, so I wasn't concerned. The clouds were getting lower, so I got on the gages just in case I had misjudged the height of the overcast. We ended up "Popeye." The light from the strobes began to reflect from the snow to the overcast and back again. The top and bottom strobe were not rotating at the same rate so they cycled into ync and out again. As the overcast got lower, the strobes produced an irregular flickering light coming from all directions. The effect was devastating. "Ken, turn off the beacon," I yelled! Before he could turn the lights off, my head had begun to spin.

What you've just read is one experience with a phenomenon called "photic stimulation." Here are some other case histories taken from aircraft incidents throughout the Air Force:

CASE 1:

The helicopter pilot awakened after 2 hours of restless, noise-disturbed sleep aboard his aircraft. As he awoke, he saw that the copilot's head was thrown back and making a jerky side-to-side movement. A crewman, summoned to the cockpit, restrained the copilot who went into convulsive leg and arm movements, striking the pedals and cyclic control. The fact that his shoulder harness and lap belt were secured prevented complete uncontrollable activity during his seizure. Nevertheless, the pilot had considerable difficulty maintaining control of the aircraft during the copilot's seizure.

The copilot lost consciousness for the next 10 minutes, during which his convulsive activity waxed and waned. At one point, a crewman tried to check the copilot's tongue to make sure he could breathe, but could not open his mouth because the copilot's jaw muscles were contracted. After landing, the copilot again reached for the controls and had to be restrained. With the aid of a crash crew, he was forcibly removed from the cockpit through the emergency exit and taken to the dispensary.

On arrival at the dispensary, the copilot was dazed, groggy, and disoriented. A neurological evaluation was made, and his electroencephalogram (EEG) was normal ... until light stimulation at 10 to 12 FPS was attempted. At this time, seizure activity was noted, and the procedure stopped.

CASE 2:

After a helicopter had been airborne for about 10 minutes, the pilot began to feel sleepy, suddenly lost consciousness, and had a convulsion. He later reported, "All I could see was a bright flicker of the sun through the rotor blades."

CASE 3:

While standing on the ramp waiting for an incoming C-54 to shut down, a pilot serving as airdrome officer, noted the rays of the setting sun through the revolving propellers and had a grand mal convulsion on the ramp.

CASE 4:

A case of flicker vertigo was caused by sun reflection from a vibrating masonite hood installed in an aircraft for instrument practice. The pilot reported there was no appreciable time element involved. As soon as the aircraft was headed in a direction where light produced a flicker, it caused an immediate attack of vertigo. As soon as the pilot recognized this condition as vertigo, he concentrated on the instruments and was able to read them, although they appeared to be floating in the air. He found that he could stop and start the vertigo by holding the hood piece tight against the aircraft structure to stop the vibration.

What is photic stimulation? It's stimulation of the alpha wave of the brain which disrupts its natural frequency, and is caused by a flickering light. The alpha wave and the degree of change can be measured by an EEG. Where the natural frequency of the wave (8-10 cycles per second) is increased (photic driving) or the wave becomes irregular (flicker vertigo), the victim will

photic stimulation

experience disturbing mental effects and may have some type of epileptiform seizure.

When the frequency of a light is below four times a second, your eye is able to see individual pictures, and the light will appear to flash. As the rate increases to 4-6 cps, your eye is no longer able to discern individual pictures, and the light will begin to flicker. At approximately 24 cps, the eye is not able to detect the fluctuating intensity of the light, and a smooth scene appears. For a reference, the old silent movies were slower than 18 cps; present home movies are at 16 cps; and the sound movies are at approximately 24 cps.

Photic driving can occur when a light is flashed into the eye at a rate below 8 cps and the flash rate increased. As the flash rate passes 8 cps, the alpha wave may begin to follow the light frequency. When the alpha frequency reaches approximately 24 cps, the person susceptible to photic driving will experience contractions of some, or all, of the voluntary muscles (epileptiform seizure).

A flickering light with a frequency of 20-40 cps can cause an irregularity of the alpha wave and symptoms commonly known as flicker vertigo. The symptoms of flicker vertigo are (1) irritability, (2) queasy stomach and general uneasiness, (3) general malaise including cold sweats and temporary nausea, (4) hypnotic or catatonic state, and (5) an epileptiform seizure. Although the affected person will usually go through some sequence of these symptoms, he can enter the sequence at any point. The first symptom may even be a grand mal seizure. Dr. William R. Pierson, Head of the Human Factors Department at the USC Safety Center, states that irritability is the most critical in relation to flying safety. The less severe symptoms cause strained interpersonal relationships and mental and physical errors without apparent cause.

The effects of photic stimulation have not been emphasized in the Air Force. The Air Force Flight Surgeon's Manual does not mention photic driving or flicker vertigo. Because of the cutting or reflecting of sunlight by props, photic stimulation is more likely to occur around propeller aircraft or helicopters. In fact, in 1971, the US Army attributed seven deaths to photic stimulation. However, the problem does occur in the Air Force. Not long ago, a C-130 loadmaster experienced a grand mal seizure while watching the setting sun through the blades of a starting C-130 engine. The incident that I related at the beginning of this paper illustrates what may be a growing problem for the Air Force. We are beginning to equip whole fleets of aircraft with strobes in place of the rotating beacon. Because of the intensity of these lights, the possibility of photic stimulation is increased.

What can be done about this problem? Education is the first step. Education is especially necessary for aircrew members since only very rarely can the victim recognize his own symptoms. Secondly, we must analyze light sources around airfields and aircraft to see if we have situations to cause photic stimulation. Finally, incidents and accidents that involve some sort of personnel error should be analyzed to determine if photic stimulation was a possible cause. ➤

AIRCREWMEN of DISTINCTION

Capt Aubrey A. Landry, Jr.
23d TASS/602d TAIRCW
Bergstrom AFB TX

Capt Allen M. Snow
23d TASS/602d TAIRCW
Bergstrom AFB TX

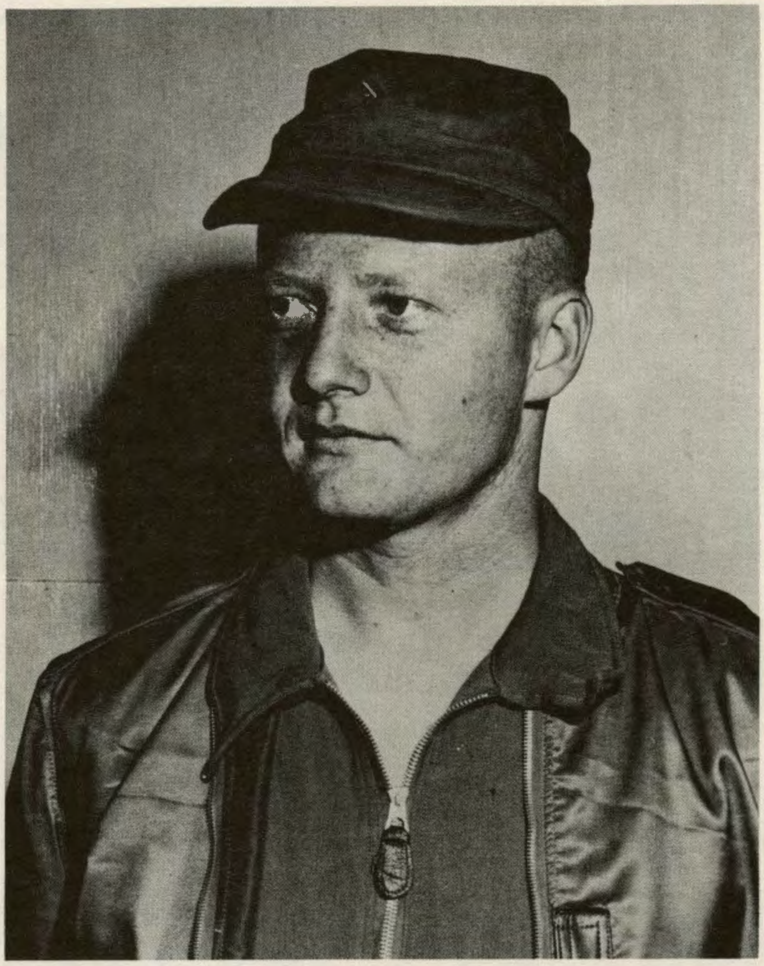
Captains Landry and Snow were returning to Bergstrom AFB at 4,000 feet AGL and 195 KIAS after completing a navigation mission in an O-2A. Captain Snow, who was flying the aircraft from the right seat, moved the yoke forward to counter a slight climbing tendency. The yoke was moved full forward with no perceptible change in aircraft attitude. Captain Snow immediately began using only elevator trim and rudders to control the aircraft. Believing that the yoke had become disconnected from the elevator control linkage, the two pilots decided not to disturb the yoke and continued their return to base using only elevator trim and rudders.

The pilots notified the Supervisor of Flying (SOF) and declared an emergency. A technical assistance team was assembled, and they concurred with the pilots' decision to perform a controllability check over the field where rescue facilities were immediately available. The landing gear was lowered, and the aircraft is slowed to 90 KIAS with no significant control problems. The crew decided to use 90 to 100 KIAS for the approach and landing. A gear-only, no-flap configuration was elected in order to have more trim authority available and so the aircraft would have a more nose-up attitude. Additionally, the crew decided to use manual trim rather than electrical trim in order to ensure positive control and more sensitivity during the critical touchdown phase.

Captain Landry worked the trim wheel and rudders while Captain Snow manipulated the engine controls during the maneuvering for a long, straight-in final approach. A constant attitude was maintained until passing over the runway threshold. Captain Landry gradually flared the aircraft with elevator trim while Captain Snow coordinated a power reduction, and a successful touchdown on the main gear was accomplished. Postflight investigation revealed that the yoke had become disconnected from the elevator control linkage

Captain Landry's and Captain Snow's quick and comprehensive analysis of a unique and potentially disastrous situation, combined with superb piloting skills and crew coordination, prevented the loss of a valuable aircraft as well as their own lives. Their performance qualifies them as the Tactical Air Command Aircrewmen of Distinction.

PLACE THE FACE



This F-80 "Shooting Star" fighter pilot was assigned to the 8th Fighter Bomber Wing in Korea during 1952.

It looks like our second "Place the Face" personality was too easy for all the eagle-eyed folks in the field. Over 50 votes were received and only 5 incorrect answers. Good show.

The winner of the January contest was Lieutenant Colonel Leo F. Callahan, Chief, Group Operations and Training, 354th Combat Support Group, 354th Tactical Fighter Wing, Myrtle Beach AFB, SC. He quickly and correctly identified the fighter pilot pictured in the January issue as Major General James A. Knight, Jr., Commander, USAF Tactical Fighter Weapons Center. Colonel Callahan will receive the coveted Fleagle Fanny Feather of Fate Award emblazoned with a genuine rustproof Fleagle tail feather and signed by our hero himself.

This month brings the photo of an F-80 fighter jock of the past ... can you "Place the Face"? Because of the large response, we're forced to request all votes be submitted in writing to:

TAC/SEPP
Langley AFB VA 23665

Be sure to include your name, duty title, and unit of assignment.

The winner of this month's contest will be announced in the May issue. Good luck! ➢

DOWN TO EARTH

PALUMBO the DRAGON

By Mr. Ed Palumbo
354th TFW/Ground Safety Division
Myrtle Beach AFB SC

Once upon a time, there was a dragon named Palumbo. Palumbo was a cool dragon (none of that flame-belching business for him). He was a very old dragon because he believed in acting safely wherever he slithered.

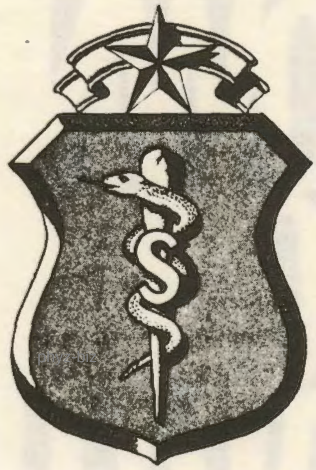
One day, Palumbo emerged from the forest and came upon two young horses playing in a meadow. Since gamboling was not Palumbo's idea of how to live to a ripe old age, he picked out a nice rock and lay down on it to watch the horses and soak up some sun.

Soon the horseplay became wilder, and one of the horses stuck out a hoof and tripped the other. The victim fell to the ground and hit his head on a rock. "Oh dear, it always happens," sighed Palumbo, as he crawled over to the prostrate horse and examined his wound. Against his natural impulses, he breathed and cauterized it. Then, he chided the offender, "Horseplay causes mishaps."

The horse whinnied his remorse ... the same way people do when confronted by the consequences of horseplay which they thought was a great big joke at the time.

"Horseplay is no accident," he continued sternly. "It's stupid to hurt someone in the name of fun." So Palumbo's moral was formulated. Whether you're at work, home or play, you'd do well to remember it. Palumbo's voice of reproach may come back someday to haunt you in your guilt. Palumbo's moral: "You don't have to be a horse to indulge in horseplay - just part of one." →

PHYZ-BIZ



cold injury

By Lt Col Harold Andersen
HQ TAC Physiological Training Coordinator

This winter has established itself as the coldest of the century. For the first time in memory, snow has fallen in southern Florida; crops have been damaged and property destroyed by cold. In this setting, it is appropriate to examine some pertinent aspects of cold.

Newspapers and TV news reports have given front page coverage to several deaths, usually of elderly persons, directly attributed to cold exposure. In light of these cases, it is difficult to conceive of humans who can sleep, while nearly nude, in temperatures of 0° to -5°C. Yet, this is commonplace for the aborigines of Central Australia. Another interesting description is provided by Charles Darwin in his 1839 journal of the HMS Beagle about the natives of Tierra del Feugo. It seems that the natives of this "... wretched climate subject to extreme cold ..." are quite unusual in that they were " ... able to exist unclothed and without shelter." Darwin was impressed by the sight of falling snowflakes melting on the unadorned breasts of the native females.

Literature abounds with accounts of arctic journeys lasting 60 or more days, where heavy hauling work was required in temperatures as low as -62°C. In these cases, as we might expect, diet, clothing, and shelter made survival possible. Most readers are familiar with the clothing and shelter elements. Clothing and igloos of the Eskimos are familiar, but the food requirements of these people are most unique. Although documented more than a century and a half ago, they still will arch a few eyebrows. In 1824, an arctic explorer invited an Eskimo to lunch and recorded the following menu in his "Private Journal of Capt G. F. Lynn":

SOLIDS

Bread-dust and train oil	1 lb 10 oz
Walrus flesh, boiled	7 lb 1 oz
Seal and bread	1 lb 0 oz
2 Tuna candles	3 oz
Bread and butter	1 oz
TOTAL	9 lb 15 oz

FLUIDS

Rich walrus soup	2 qts
Water	4 qts
TOTAL	6 qts

NOTE: "train oil" is oil from the blubber of a whale or other marine animal.

Of the eating habits of the Eskimo, Lynn says: "Both sexes eat in the same manner, although not in equal proportions; the females very seldom, and the men very frequently stuffing until quite stupefied .... In this manner a meal continues a long time, as each eats, or rather bolts several pounds, and the pots are in consequence frequently replenished. In the intermediate time, the convives suck their fingers, or indulge in a few lumps of delicate raw blubber .... *On all occasions the children are stuffed almost to suffocation.*" Such eating habits outside the arctic environment would probably result in numerous physiological problems.

From the foregoing, it's obvious that the ability to survive and/or operate in extreme cold requires special preparation of clothing and shelter and adoption of a special diet (which might be the greatest challenge of all). With little fear of error, I venture to say that few TAC aircrews are so prepared. Although it may be superfluous to point out, one should remember that failure to meet the environmental stresses imposed by intense cold results in cold injury ... frostbite, hypothermia and death. More on frostbite will be presented later. Hypothermia is a relative term, but failure of the temperature regulating mechanism occurs when the core temperature of the body falls to 33°C or thereabouts, and death occurs at some point below 25°C. (Normal body temp is 37°C.)

Body heat is produced by the metabolizing of foodstuffs. Fats have the greatest caloric content, followed by carbohydrates and protein with less heat producing material.

Heat is not produced in equal amounts in all areas/organs of the body. For example, the brain with about 2% of the body's total weight produces 18% of its heat, while muscle with 50% of the body weight produces only 20% of total heat while at rest.

The body loses heat to its environment through the mechanisms of conduction, convection, radiation, and evaporation. Exposure to cold increases heat loss due to conduction, convection, and radiation, but reduces loss due to evaporation of perspiration from the skin surface.

Very simply stated, the body conserves heat in a very cold environment by reducing blood flow to less important or less essential peripheral areas, such as the arms and legs, while maintaining the core of the body (head and trunk) at a normal or nearly normal temperature. For example, at an ambient temperature of 7°C, the core of the body, including the brain, heart, kidneys, liver, etc., will be maintained at 37°C, while fingers are 28°, calf of leg 31°, arm 32°, thighs 34°, etc. It is very important to wear a hat or cap to conserve head heat. At -4°C, heat loss from the uncovered head may amount to half the total heat production of the entire body at rest.

Essentially there are three conditions which should be understood in order to permit safe operation in cold environments: frostbite, immersion foot (trench foot) and accidental hypothermia. Most cases of cold injury will probably involve some aspects of all three conditions because such factors as length of exposure, temperature, presence of water and the patient's physical condition can affect the severity of the injury.

Frostbite is the destruction of tissue by freezing. There is a coagulation of the blood in small blood vessels, and the clot blocks flow to the tissue, causing a local hypoxic condition. This, coupled with the destruction of tissue cells by the formation of ice crystals, will result in blister formation and gangrene (death of the tissue). Frozen areas will usually present a white, waxy, hard appearance initially, and later become red or mottled.

In cases of immersion/trench foot, actual freezing does not occur. Prolonged exposure to cold is characterized by swelling, neuromuscular changes and paresthesia. Blisters and gangrene may be present if mechanical trauma exists. Such trauma might come in the form of simply walking or prolonged standing when the feet are extremely cold and wet.

Accidental hypothermia, the unintentional lowering of the temperature of the core of the body due to cold exposure, presents symptoms which include weakness, stumbling, falling, abnormal behavior and eventual collapse and stupor.

The proper treatment for frostbite and immersion foot is to adopt a three-pronged approach. First, and probably most important, is the rapid rewarming of the affected area in water at a temperature of 38°-40°C. It is important to maintain this temperature range with great precision, using a thermometer and constant monitoring. Slow thawing at temperatures below this range (38°-40°C) increases tissue damage. Rapid thawing at temperatures of 43°C and above will also cause damage. Second, maintenance of maximal circulation - best accomplished by a physician using special drugs, but a couple of shots of whiskey will do a pretty good job until he arrives (alcohol is an excellent dilator of the peripheral arteriolar circulation). Third consideration is to cover the area with a burn dressing (bulky, non-irritating dressing) over an antiseptic ointment.

Treatment of accidental hypothermia is mainly supportive in nature. If unconscious, be sure the victim has a clear airway. Once this is established, use blankets to prevent further heat loss and to permit slow rewarming. If possible, monitor the core temperature of the victim's body with a rectal thermometer.

One final caution: the environmental temperature need not be extremely low in order to cause frostbite. As the charts below indicate, flesh may freeze in one minute if exposed to a temperature of -90°C with wind conditions of 30 mph (-26). Study the accompanying charts and make yourself aware of the wind chill factors which may be prevalent in your area during the winter months.

Being aware of potential dangers is one of the best ways to cope with them. ➛

WIND SPEED		EQUIVALENT CHILL TEMPERATURE CHART																				
KNOTS	MPH	TEMPERATURE (°F)																				
CALM	CALM	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
		EQUIVALENT CHILL TEMPERATURE																				
3-6	5	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-65	-70
7-10	10	30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-75	-80	-90	-95
11-15	15	25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100	-105	-110
16-19	20	20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-95	-100	-110	-115	-120
20-23	25	15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120	-125	-135
24-28	30	10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110	-115	-125	-130	-140
29-32	35	10	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130	-135	-145
33-36	40	10	0	-5	-15	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115	-125	-130	-140	-150
WINDS ABOVE 40 HAVE LITTLE ADDITIONAL EFFECT		LITTLE DANGER					INCREASING DANGER (Flesh may freeze within 1 min)						GREAT DANGER (Flesh may freeze within 30 seconds)									
		DANGER OF FREEZING EXPOSED FLESH FOR PROPERLY CLOTHED PERSONS																				

INSTRUCTIONS

MEASURE LOCAL TEMPERATURE AND WIND SPEED IF POSSIBLE; IF NOT, **ESTIMATE**. ENTER TABLE AT CLOSEST 5° F INTERVAL ALONG THE TOP AND WITH APPROPRIATE WIND SPEED ALONG LEFT SIDE. INTERSECTION GIVES APPROXIMATE EQUIVALENT CHILL TEMPERATURE; THAT IS, THE TEMPERATURE THAT WOULD CAUSE THE SAME RATE OF COOLING UNDER CALM CONDITIONS.

NOTES

WIND

1. THIS TABLE WAS CONSTRUCTED USING MILES PER HOUR (MPH); HOWEVER, A SCALE GIVING THE EQUIVALENT RANGE IN KNOTS HAS BEEN INCLUDED ON THE CHART TO FACILITATE ITS USE WITH EITHER UNIT.
2. WIND MAY BE CALM BUT FREEZING DANGER GREAT IF PERSON IS EXPOSED IN MOVING VEHICLEE UNDER HELICOPTER ROTORS, IN PROPELLOR BLAST, ETC. IT IS THE RATE OF RELAATIVE AIR MOVEMENT THAT COUNTS AND THE COOLING EFFECT IS THE SAME WHETHER YOU ARE MOVING THROUGH THE AIR OR IT IS BLOWING PAST YOU.
3. EFFECT OF WIND WILL BE LESS IF PERSON HAS EVEN SLIGHT PROTECTION FOR EXPOSED PARTS - LIGHT GLOVES ON HANDS, PARKA HOOD SHIELDING FACE, ETC.

ACTIVITY DANGER IS LESS IF SUBJECT IS ACTIVE. A MAN PRODUCES ABOUT 100 WATTS (341 BTUs) OF HEAT STANDING STILL BUT UP TO 1000 WATTS (3413 BTUs) IN VIGOROUS ACTIVITY LIKE CROSS-COUNTRY SKIING.

PROPER USE OF CLOTHING and ADEQUATE DIET are both important.

COMMON SENSE THERE IS NO SUBSTITUTE FOR IT. THE TABLE SERVES ONLY AS A GUIDE TO THE COOLING EFFECT OF THE WIND ON BARE FLESH WHEN THE PERSON IS FIRST EXPOSED. GENERAL BODY COOLING AND MANY OTHER FACTORS AFFECT THE RISK OF FREEZING INJURY.

This chart is adapted from AFP 161-1-11

NORAD FORM NOV 67 12 A

By MSgt Domingo O. Opio
602d TAIRCW/Weapons Safety
Bergstrom AFB TX

EXPLOSIVES + CHILDREN = DANGER

Little Johnny is nine years old. His father is a career officer who has great plans for Johnny's future. Johnny has been very active in Little League sports. He has excelled in football, basketball, track and field, and baseball. Because of his aptitude for all group sports, his dad has already envisioned his receiving an athletic scholarship to college. Audrey is nine years old. Her father is also a career officer, who like Johnny's father, has great ambitions for his daughter's future. Audrey's IQ is uncommonly high, and she shows an immense prowess for science and mathematics. She and Johnny are very good friends.

One sunny Sunday afternoon not long ago, Johnny decided to explore some of the military installation where he and his family lived. He wandered on the local Firing Range during his explorations and found an interesting object which had all the appearances of a grenade. He immediately took the object home and called Audrey to come over to his house and admire his new found treasure. While investigating the design features of the device, one of the children decided to strike it with a hammer. As designed, the device exploded. Johnny's legs began bleeding profusely, and he was transported to the base hospital where he was treated for severe shrapnel wounds to the lower portion of his body. Audrey lost consciousness and was taken to a nearby community hospital. She was taken directly to surgery for a brain operation. The condition of both children is listed as "stable."

Another story made up by Safety weenies to frighten you? Unfortunately ... no. The story is a summary of a recent explosives accident ... everything is factual, except the names of the children. Let's learn from this unfortunate accident. Educate your children on the dangers of explosive devices. Show them the areas of the base where dangerous explosive items are likely to be found. Be honest with them. Tell them what to do if they find a suspected explosive device and why. Let's protect our children ... please.

chock talk

...incidents and incidentals with a maintenance slant.

FERD FODGOTCHA STRIKES AGAIN

Two recent FOD mishaps reveal that ol' Ferd is still running rampant.

Ferd struck an A-7 first. The SLUF's engine was removed because of a failed boroscope inspection and Jet Engine Intermediate Maintenance (JEIM) involving replacement of the HPT-1 vanes. Following the JEIM, the engine was brought to the test cell where all of the starting procedures were performed IAW the tech order. After engine start, the engine was operated at idle power for 10 to 15 minutes while leak checks were performed and the high pressure fuel system was bled. Then, as the power was advanced and RPM reached 62 percent, unusual noises were heard and sparks were seen coming from the engine exhaust ... the unmistakable calling cards of FERD FODGOTCHA.

Four small foreign metal pieces were found in the low pressure turbine and tailpipe exhaust area. Nine more pieces were found after engine teardown. Close inspection of the metal revealed the letters MF on one and the number 71 on another. Composite tool kits were inventoried and, sure enough, a 5/16-inch X 1/4-inch drive socket was missing. Its serial number was MFD 4710.

Although the unit had tool control procedures on paper, no set pattern of control had been established. Inventories were not always being conducted at the beginning and end of each shift. Personnel were also taking tools from the JEIM tool kit and using them on other maintenance jobs.

This mishap cost $41,248 and 376 manhours to replace the engine. A lot of time and money for an accident that could have been prevented.

The second mishap occurred to an RF-4C. The Photo Phantom was scheduled for a night engine run-up on the number two engine. Two engine specialists reviewed all the forms and proceeded to make their FOD inspections. After inspecting the intake screens for loose bolts and rivets, one of the technicians installed a screen. He noticed that its rubber padding, which makes a seal to prevent foreign objects from entering the engine, was out of position. The technician removed the screen, repositioned the padding, and reinstalled the screen. The only problem was, he had placed his flashlight in the intake while fixing the screen and forgot to remove it.

It couldn't happen? Well, it did ... to the tune of $1,140 and many manhours. All because of carelessness and not taking the time to position a light cart.

Engines have been damaged by everything from water to a fireman's helmet. Although TAC had fewer occurrences of engine FOD during the past year ... they have been more costly. In fact, the cost per incident has tripled over the last 5 years. When do most FOD incidents occur? Ninety-six percent of engine FODs happened following some type of maintenance ... TCTO, routine, etc. When you're doing the job, take your time. Make sure there are no foreign objects in or near the aircraft. It may take a little longer ... but it will save a lot of explaining.

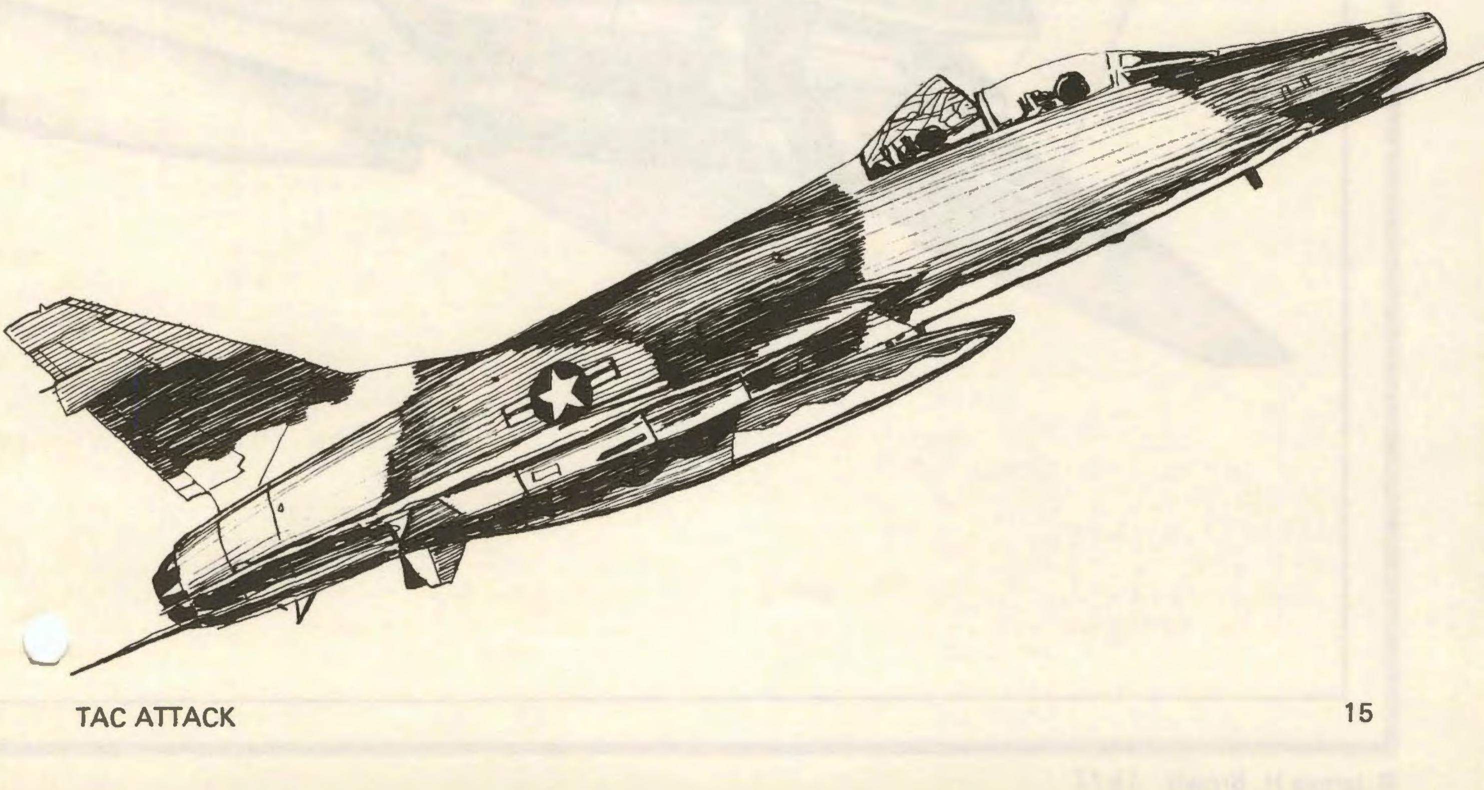
HUN FLIPS LID

The rear canopy of an F-100F needed changing due to grazing. Along each side of the canopy glass is a fiberglass cloth loop which is fitted into a groove in the canopy frame and held in place by a retaining rod. Installation procedures require a wire to be inserted through each loop prior to fitting the loop into the canopy frame. The wire is then used to guide the retaining rod through the cloth loop after the loop is inside the groove in the canopy frame. During this installation process, the guide wire in the right canopy loop broke. The maintenance technician then attempted to feed a new wire through the loop without removing the loop from the canopy frame. This did save some time ... unfortunately, the new wire passed along the side of (not through) the rear canopy loop. When the retaining rod was inserted, it followed the guide wire and did not pass through the loop, leaving the canopy glass unsecure.

First two flights after the canopy change were uneventful because they were conducted at low altitude where the difference in pressure between the cockpit and the outside was insufficient to cause canopy glass separation. The third flight was at night. After leveling at 24,000 feet, the pressure differential was great enough to cause the canopy glass to separate from the frame; the canopy glass shattered due to air loads. Pieces of the glass struck the rear cockpit pilot's helmet with sufficient force to break the visor housing and the dark visor. Fortunately, the pilot's clear visor was down, preventing facial injuries.

It cost Uncle Sam $1,733 and 40 manhours to fix the damage resulting from this incident. Time and effort expended to do a job correctly, the first time, are always less than it takes to do the job over. The pilot puts his trust in you to do the job right. He expects that his aircraft has been maintained IAW the tech order using the highest professional standards. Live up to this trust ... we're depending on you.

"Time and effort expended to do a job correctly, the first time, are always less than it takes to do the job over."



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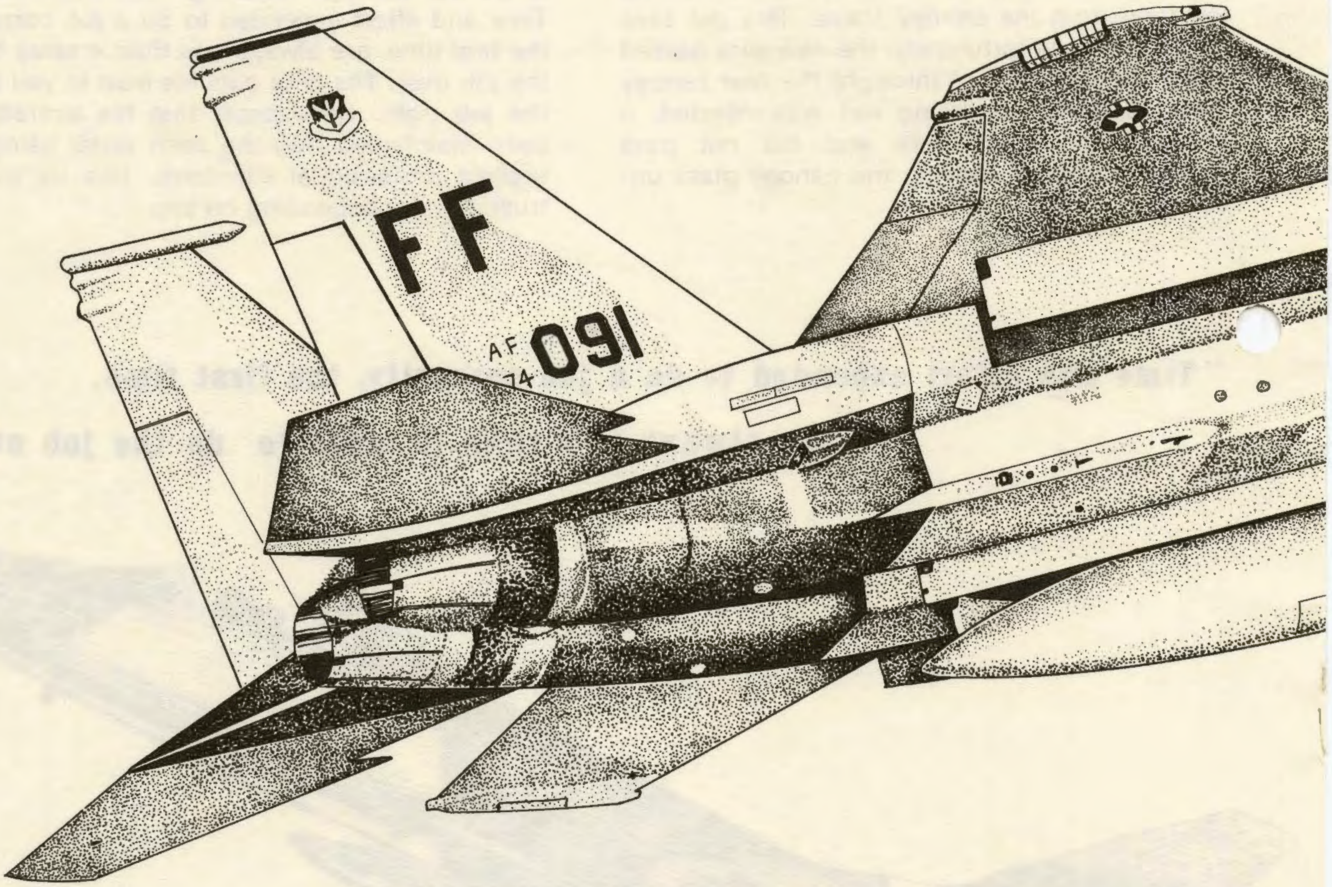

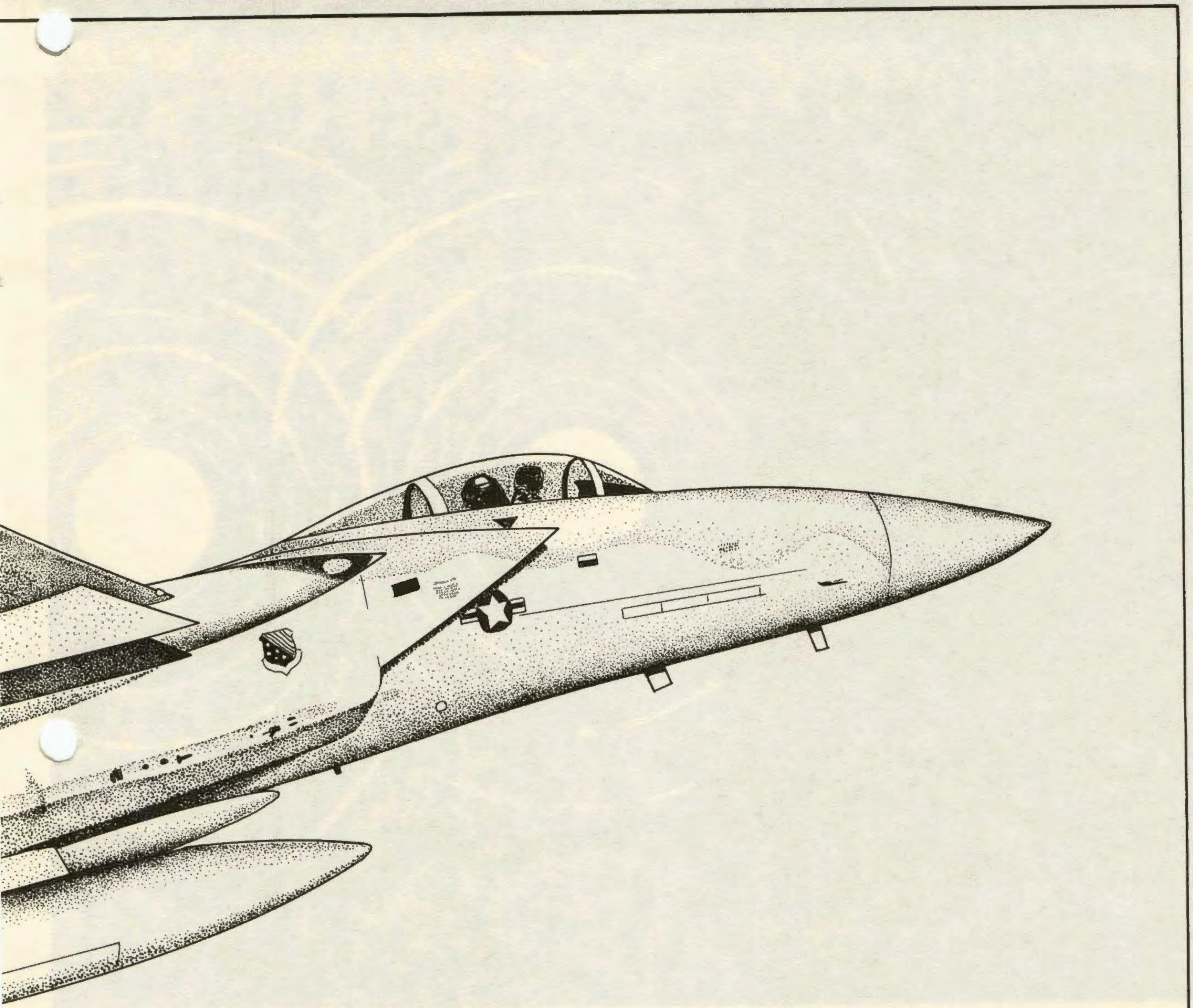

James H. Brown

hazards of assumption

How are your instincts? How good are you at second-guessing things? Well, if you're as good as I am, and you throw in a little bit of luck and some sound, logical reasoning, you should be able to make accurate assumptions about most things most of the time. However, keep in mind the consequences that may exist in the event your assumption is wrong. Take driving, for instance. An erroneous assumption while driving could have hazardous, even deadly, results. Let me give you an example by citing a recent personal experience. It happened just last night, in fact, and I write this to preserve the lesson from it.

It had been a tiresome week, and all I could think of after work was the enjoyment a short nap would bring before my drive to a friend's house for an evening of card playing beginning at 7 P.M. I set the alarm for 6:30 P.M., and dozed off after the first few minutes of the CBS evening news.

The scheduled nap time passed swiftly, but the alarm failed to sound. I finally woke up to someone's hysterical gasps on the last few minutes of a TV quiz show. Apparently she had won the jackpot - but I had lost 25 minutes - it was 6:55 P.M!

I slipped into a shirt and trousers and scrambled out of the house into my old, but depend-

By Capt Richard L. Holden
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able, Chevy. It was normally a 20-minute drive, but with traffic and stop lights on my side I figured I could be there shortly after 7 P.M. I would have to stretch a few traffic rules here and there, but I had gotten by with that before. In fact, I had never, to this day, received a speeding ticket or had an accident. Obviously, I was what you would call "a safe driver."

The traffic was definitely on my side; very few cars were on the highway. I considered the time of evening and recalled that police cars were normally parked at a nearby roadside restaurant around 7 P.M. Assuming this night was no different, I stretched the speed limit by 10 or 15 MPH until I approached the cafe. As I passed, I made sure I was within the limit. My hunch was correct. Two empty police cars were parked outside.

I picked up speed again to skate through a yellow light and remembered a short-cut to avoid two more lights ahead. The car well in front of me was traveling unbearably slow. Finally, its left blinker went on. I knew there was no left turn-off here and assumed the car contained some typical lost tourist who didn't know his left from his right. I proceeded to sail past him on the left and checked my rear view mirror to verify my assumption. He came to a near-stop, then proceeded to make a right turn.

As I entered a neighborhood well-known for its abundance of children, I checked my speedometer. I was traveling much faster than I had realized. My right foot eased off the gas and I hit my high beams, since no other traffic was on the road. I seldom passed through this area without seeing at least one youth, so I continued cautiously, convinced of the danger and expecting someone to dart out from nowhere at any time. As suspected, two young lads with baseball gear ran carelessly across the street - no more than 50 feet in front of me.

As I exited this neighborhood, I glanced at my watch to determine if I had actually saved time taking this route. It was 7:04, and I still had a few miles of out-of-town driving to go before reaching my destination.

The small country stretch ahead was my favorite portion of the route. The only "speed trap" I recalled was on the outskirts of the city limits before the actual stretch began. I maintained the speed limit until I saw the 55 MPH sign ahead. At the same time, I noticed the reflection of a car door near some bushes well off the road. As I passed, I saw the silhouette of the speed gun mounted on the door and smiled to myself as I counted my score of flawless assumptions.

I slowly accelerated until I passed over the first hill. Then I decided to make the next few minutes count. There was no danger on this road, and needless to say, I felt lucky. The speedometer moved up to 65 and approached 70. I glided around an ever-so-slight curve in the road when it happened.

It was over before I could even think of stopping. All I saw were the spokes on bicycle wheels followed by a young terrified face, looking into my headlights. He was crossing the road and I hit him broadside. Who would have expected a boy to be riding a bike at night out in the middle of nowhere? Why did he try crossing the road when he should have heard and seen my car coming?

My mind ached and hands began shaking violently as I felt my foot apply pressure on the brakes. I could scarcely find the key to shut off the engine. Then - dead silence - except for my own nervous, desperate breathing. I reached for my flashlight, stepped out of the car and slowly began walking back.

The rays from my light centered on the catastrophe. It lay without motion - directly in the path of my vehicle. I closed my eyes and felt the hot tears running down. Then, falling to my knees on the asphalt, I begged God that it wasn't true; yet, I knew there was no hope.

The silence of the night was broken by a sudden spontaneous loud noise. I opened my eyes in time to see the local news team saying "Good night" on my TV set. Still in a semi-state of shock, I turned to the source of the noise. My alarm clock showed 6:30 as I reached over to end the ring. My hand was still shaking, and I smiled in gratitude for my second chance.

Then, before leaving once again for my friend's house - I briefly closed my eyes and prayed that I would make no careless assumptions on the drive ahead.

TAC TIPS

interest items, mishaps with morals, for the TAC aircrewman

Blessed are the forgetful: for they get the better even of their blunders.
Nietzsche

WHAT IS A FLIGHT LEADER?

by Maj Steve Altick
188th TFG, Ft. Smith
MAP, AR

Well ... he's the guy who tells us how it is all going to happen in our flight today; the guy who asks us the "TIE BREAKERS" in the briefing; the guy who outlines the bet; and the guy who teaches us something we didn't know. After we get airborne, he's the guy whose wing we tack onto and thrash through the weather. He's the one who knows where we're going and how. He's the guy that gets us down, and when things get terse for us, he's the one we turn to for help. When it's over, he's the one who chews us in debriefing, collects his winnings, and then, maybe, buys the first round of beer.

If you buy that description, then think about what it takes for a flight leader to be ready for the mission:

1. Preparation for the mission requires hours of planning, using the intelligence folks as well as weapons/tactics people to help plan.

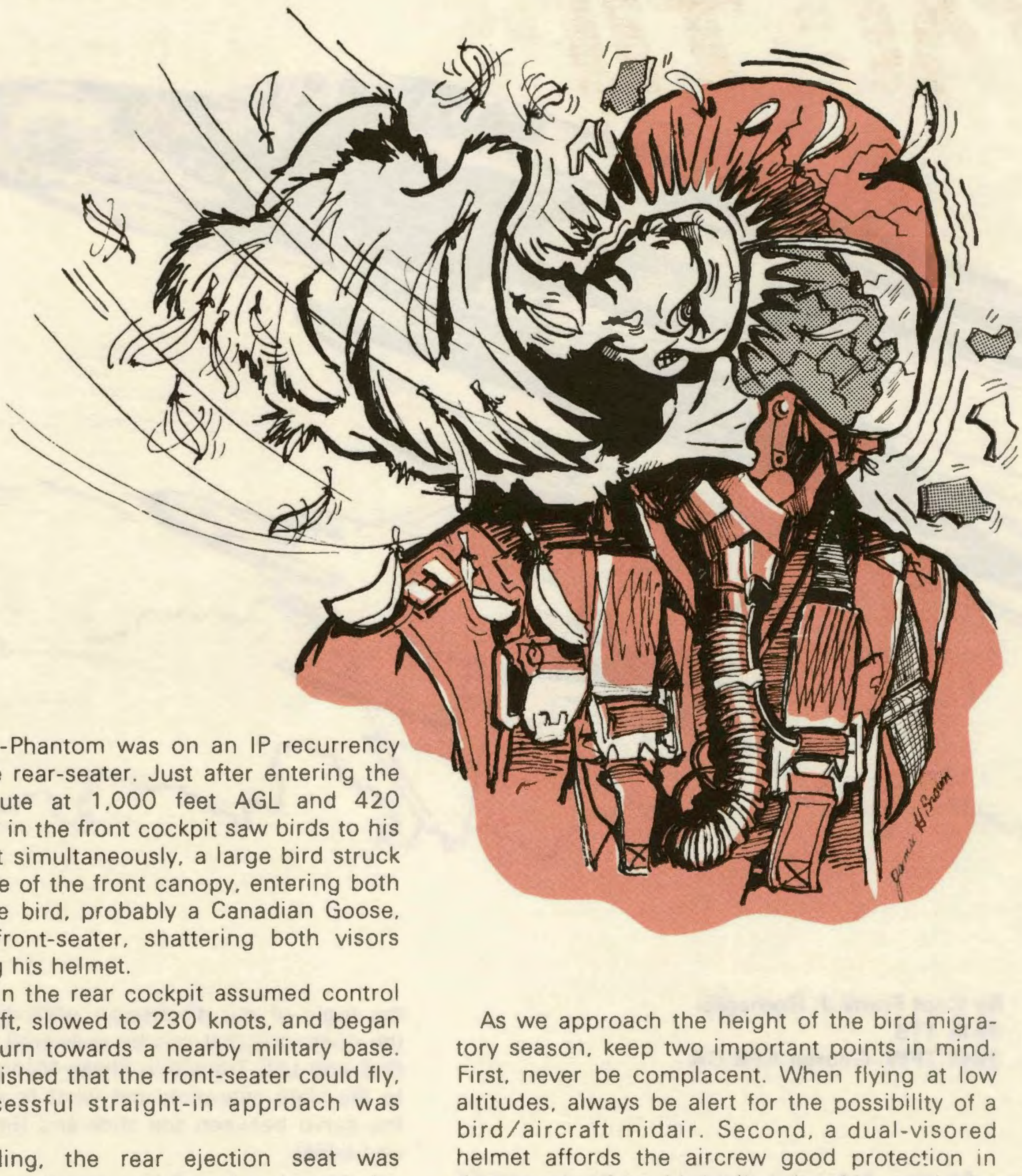
2. He checks the boards on his flight members, their DOC sorties, currency, and their proficiency in the tasks to be performed.

3. He starts briefing on time or early; he briefs for the weakest man in the flight; he plans on those contingencies that usually don't happen.

4. In the air, he constantly manages the flight. He insists on discipline, makes the decisions, and flies the mission for the weakest man in the flight.

5. On the ground, but not done, he conducts a solid debriefing and makes it a learning situation. He insures that flight members log their sorties, sign in, deposit film, and turn in their maps, etc. Then and only then, he buys them that first round of beer. (With their money.)

PHOTO-PHANTOM gets the BIRD



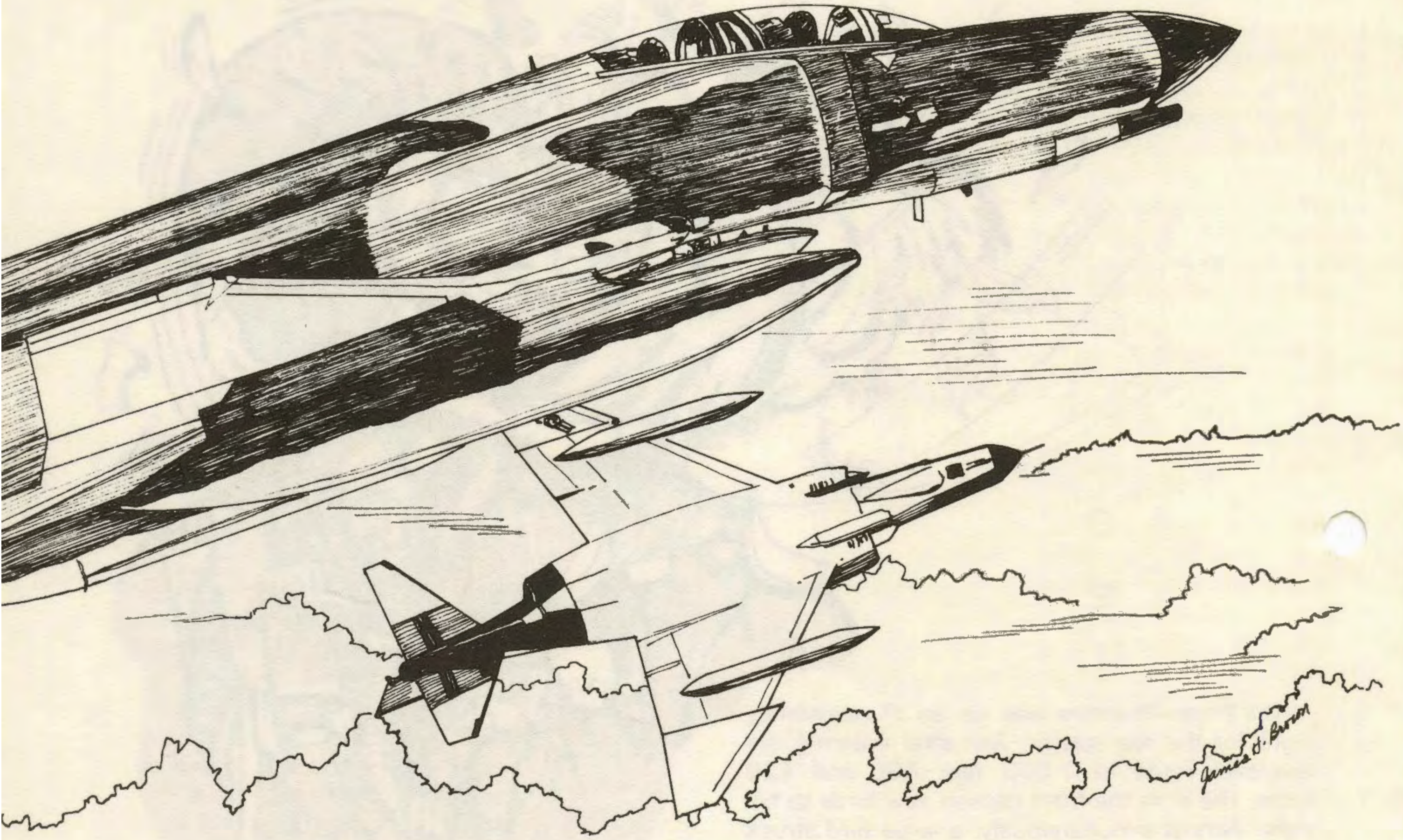
The Photo-Phantom was on an IP recurrency flight for the rear-seater. Just after entering the low-level route at 1,000 feet AGL and 420 knots, the IP in the front cockpit saw birds to his right. Almost simultaneously, a large bird struck the right side of the front canopy, entering both cockpits. The bird, probably a Canadian Goose, struck the front-seater, shattering both visors and breaking his helmet.

The pilot in the rear cockpit assumed control of the aircraft, slowed to 230 knots, and began a climbing turn towards a nearby military base. It was established that the front-seater could fly, and a successful straight-in approach was made.

After landing, the rear ejection seat was checked for continuity and found to be safe for normal egress. The front cockpit ejection seat was unsafe, and an egress technician was flown to the divert base. After he safetied the seat, the front-seater egressed through the broken canopy.

As we approach the height of the bird migratory season, keep two important points in mind. First, never be complacent. When flying at low altitudes, always be alert for the possibility of a bird/aircraft midair. Second, a dual-visored helmet affords the aircrew good protection in the event of a birdstrike. In this particular mishap, the front-seater sustained a bloody nose and some bruises. It would have been a lot worse had he not had both visors down. If you want a dual visor on your helmet, see your life support folks ... they'll be glad to help you out.

FLYING THE F-4 LEADING EDGE SLAT



By Capt Frank J. Romaglia
35th TTS
35th TFW, George AFB CA

All you F-4 hard-wingers out there getting ready to step up to the soft-wing ... prepare yourself for a pleasant surprise. Also prepare yourself for an aircraft that looks basically the same, but has significantly different and improved handling characteristics. That being the topic of our discussion, we'll dispense with the questions that can be answered by the Dash One and LES Transition Phase Manual, and stick to the slats operation and what to expect when the servo between the stick and throttle yanks and banks.

MECHANICS

Replacing the familiar boundary layer control system (BLC) has brought smiles to the faces of aircrew and maintenance personnel throughout

Capt FRANK J. ROMAGLIA is this month's Fleagle T-shirt winner.

the F-4 community: no more BLC problems. Keeping the system somewhat complicated, however, is a system of linkages, plumbing, wiring, bellcranks, actuating cylinders, ad nauseam. Let's briefly investigate how it works.

The system is electrically selected from the 28 volt DC bus; which means with a double generator failure, the flaps/slats will operate normally providing you have a good battery, a master switch on, and normal utility hydraulic power - not too shabby! Utility hydraulics activate the system. If utility hydraulic pressure is lost, the slats will remain in the position selected because of a mechanical overcenter lock. The flaps will either remain up or, if selected, will retract to a low drag trail position just the same as a hard wing. Check the Dash One, both Sections I and III for a thorough discussion of emergencies.

Where do all these neat things go when the "Yes, little girl, I fly jets" type moves the switch? Flaps are simple: either full up or 30° down; no longer is there a one-half position. The slats are simple too: either extended to a high lift position or retracted to a cruise (outboard) or clean wing (inboard) configuration.

Slat operation is smooth, quick, quiet, and comfortable; the pitch change is insignificant. Unless you're paying close attention or happen to have the aircraft loaded up as AOA increases through 11.5 units (after T.O. IF-4E-603), you won't even notice their movement. The operation takes less than a second (the book allows 3 seconds for slats, 6 for flaps) and the indicator works in unison with the slats.

One nit-noi (Americanized Thai word meaning "something insignificant," e.g., over at Ubon RTAFB, we coined a phrase, "The amount of nit-noi is inversely proportional to the threat. Over the years, it has taken on additional significance ... but I digress ...), one nit-noi to plug into your already overloaded computer: When the flap/slat switch is positioned such that the flaps begin extending, the indicator will immediately show down even though they're still in transit. When retracted, indicator and flap movement are synchronous.

Now for a short blurb directed toward the AOA system. With the gear down or slats in, it's the same as a hard wing. With the gear up and slats out, the AOA range has been shifted upward to reflect the significantly improved maneuvering capabilities. Also, with the gear up, the rudder pedal shaker has been deleted.(Hooray! No more worrying whether or nor the left rudder pedal is going to fall off.)

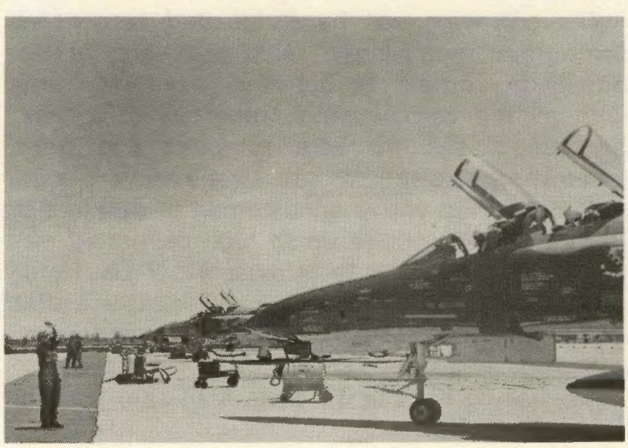
HANDLING CHARACTERISTICS

Now let's examine handling characteristics as we progress through the various aspects of a normal mission (the phrase "normal mission" is often used in conjunction with "the Real Air Force).

TAKEOFF

With a slotted stabilizer, the aircraft will be a good bit more responsive in the longitudinal axis at slower speeds; you can start the nose up by 100 knots. The LES aircraft is more susceptible to jet wash and wind gusts, so watch your T/O attitude: Do not yank it off into a gusty crosswind (by the way, max crosswind component is 25 knots) with both your nose and AOA high - you'll have your hand more full of machine than you want that close to the ground! Gear and flap retraction is normal, and the slats will retract as AOA decreases below 10.5 units.

To backtrack for a second, we all owe McDonnell Douglas a thank you. Humbly, the folks at St Louis have leaped into the breach and prevented



us "one-notch-down-for-takeoff" types from once again validating Murphy's Law. If we were to extend the flap switch to the first detent, we'd get the proper flap configuration (i.e., one-half flaps) for a hard wing T/O. Extending the flaps/slats switch to only the first detent would give us slats - OUT; a potentially dangerous no-flap T/O. Seeing this blatant opening for error, the engineers have wired the system such that when the nose gear is down, placing the flaps/slats switch to the OUT position extends the flaps as well as the slats. This in no way means that the flaps will retract when the nose gear does - they'll still have to be either raised or blown up as per Dash One.

Here's one more nit-noi to file away concerning takeoff. The AOA indexer lights are inoperative with the gear up. If you crack afterburner the second the clock strikes official sunset, by the time you've milked all the night time your JP-4 and SOF will allow, it'll be pretty dark out. Remember to turn down the rheostat on your AOA indexer lights before you lower the gear.

RIG/STAB AUG/SLAT CHECK

Now we add the slat check. Here are some points to ponder: If you pull up too gradually in attaining 11.5 units AOA, your airspeed will bleed off to 300 KCAS or even less. Also, it takes crew coordination to watch slat operation, slat indication, and the AOA gauge all at the same time. This check is accomplished prior to high AOA maneuvering, so pay attention to what it's telling you. Just because all of our 25-ton tricycles look alike doesn't mean they all fly alike - rigging can vary from aircraft to aircraft.

AEROBATICS

The soft-wing will be stable and responsive throughout its envelope, most noticeably at low airspeeds. You can be out of airspeed and flying with all the aerodynamic properties of a rock, and you'll still be able to point the nose wherever you want. Aircraft acceleration is a little slower than you're accustomed to due to slat drag, but once you're up to high calibrated airspeed, it'll feel solid to at least 6-1/2 Gs. Holding 4-5 Gs will produce no perceptible buffet down to about 350-377 KCAS. A good technique for achieving 200 KCAS over-the-top is to begin easing back to 15 units AOA after you get into light buffet.

STALLS

Generally, buffet will be mild to moderate - if at all. Wing rock will occur above 26-28 units AOA - if at all. Here's a warning note from the Dash One's excellent discussion of characteristics: "Aircrews should not depend on wing rock, buffet, directional instability (nose slice) or any classic characteristics for a stall warning. In any configuration or loading, and especially with moderately high pitch change rates, it is possible to increase AOA above 30 units without wing rock or loss of directional stability at which time loss of control may result."

Slats will only smooth out and delay an out-of-control condition - they won't prevent it. 'Nuff said!

ON THE TANKER

After snuggling up to the tanker to get your motion lotion, you may notice you're not the ol' golden hands you used to be if you're phlying a heavyweight phantom. To prevent bobbling around, you may want to go to the "override position" till you've got your onload. It's only a technique, but it could save some embarrassment.

AIR-TO-GROUND GUNNERY

Be aware you'll be able to make tighter turns, so you might want to change your roll-in technique to prevent undershooting. Also beware of "slat tuck" or dig-in: You'll get an increase in G without any stick inputs as the slats extend. Its most probable point of occurrence is a stick match trying to prevent a low pullout after a press (... Let he who is without sin cast the first stone ...).

AIR-to-AIR COMBAT

Here's where the soft-wing excels. Considering a training arena of 10-15,000' AGL and a 6-1/2-G limit, the corner velocity is about 40-50 knots less than a hard-wing.

The increase in specific excess power (Ps) becomes readily apparent as you match turns with a hard-wing at a reduced power setting. To fully appreciate this Ps advantage, have your wingman override his slats for an engagement and see how fast he becomes the attackee. Enough about F-4 hard-wings; the bad guys aren't flying them yet.

You'll notice an increase in comfort throughout the high AOA envelope due to increased stability and reduced buffet. Adverse yaw is negligible (not nonexistent) and coordinated rudder and aileron are fine, though it's still advisable to maneuver at high AOA with the pole pretty much in the middle. Reason? If you turn with ailerons at high AOA (above 20 units), you'll have to definitely move the stick forward to maintain the same AOA; you might also experience roll hesitations. Wing fences keep the wingtips from stalling as quickly as before, and also improve lateral stability - the aircraft is supposedly slightly more sluggish in roll.

Another nit-noi: going from a high AOA situation - especially when combined with a nose-high condition - to an extension or acceleration maneuver, you'll have the drag of extended slats until the gauge gets below 10.5 units. Some try overriding them as soon as they start unloading; they're quicker than I.

The increased turn capability results in a smaller combat arena - you can start a hi yo-yo 1,000 - 1,500' closer. This increased turn capability, especially at slower airspeeds, also allows you to back yourself into a corner. Pay close attention now: Sustaining maximum performance will result in an airspeed bleedoff so rapid the needle will be a blur. You might get a kill, but your 300 knot tail won't be much competition for the next Mig at your six. This airspeed bleedoff can go unnoticed due to increased stability, pitch responsiveness, lack of buffet, wing rock, and the fact that your fangs are out. The machine gives you fewer clues, so use the aural tone. Once the nose gunner padlocks a bogey, GIBs should pay increased attention to parameters.

TRAFFIC PATTERN

All that we gained in combat capability doesn't come for nothing - handling qualities in the pattern are slightly degraded.

There are two problems in the pitchout phase: The first is losing 200' in the pitch while looking for staff cars at mobile. It's a personal problem ... but a little top rudder might help. The second is that at 300 KCAS, the machine turns beautifully; so well, that if you honk it in you'll practically be going down initial in the opposite direction. But getting ready to come off the perch at 180 KCAS, you'll find the aircraft doesn't turn quite the same - watch tight pitchouts!

The soft-wing approaches about 6-10 knots faster than the hard wing Phantom. The airspeeds for various slat/flap combinations are in your checklist, so there's no need to dwell on them here. You'll notice that the single engine approach AOA is still 17 units; for all other approaches when the slats are out, use 19.2 units; when the slats are in, use 17 units. Reread this paragraph and you'll have it wired. When the slats are extended, it's fairly smooth; with the slats retracted, it's definitely not smooth.

Some people say it's tougher to fly a constant AOA; I don't find that a problem. What is noticeable is the increased stabilator effectiveness ... you can definitely flare the aircraft; by the same token, you can drag the stab tips - especially in a no-flap. Don't forget its susceptibility to jet wash and wind gusts plus reduced lateral control due to wing fences. The Dash One recommends a 17-unit approach in these conditions. Use both aileron and rudder to bring up a dropped wing and be spring-loaded to the go-around position.

No BLC means very little instant lift by just pushing the throttles forward. To get increased airflow over the wings, you have to increase airspeed - that might mean unloading; and that might mean being unable to salvage an overshoot. Conversely, just by pulling off power doesn't mean you lose lots of lift - your airspeed must bleed off first. This causes two things: a tendency to be hot and a tendency to float - you'll see what I mean at least once. Happy landings, and remember you're not out of a high threat area until you see mobile's grade slips. ➤

POPEYE

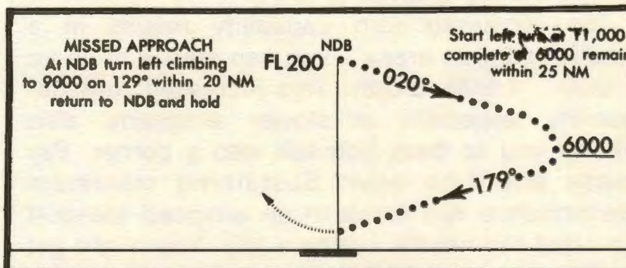
The PHANTOM flies UHF/ADF

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

The majority of USAF fighter type aircraft are UHF/TACAN-only equipped and therefore tend to fly TACAN penetrations to TACAN, ASR/PAR, or ILS final approaches as their primary instrument approach procedures. The high incidence of primary UHF radio failure and the possibility of TACAN failure in aircraft like the F-4 make it advisable to review applicable back-up approach capabilities like UHF/ADF using the auxiliary UHF receiver. Although practice UHF/ADF approaches in the F-4 may not be practiced in TAC under actual weather conditions, back-up instrument approach procedures should be practiced in VFR conditions whenever possible. If you have been flying TACAN-only aircraft, the following discussion should provide you with a good review of non-DME instrument procedures.

QUESTION: Can a UHF/TACAN-only equipped aircraft fly a Hi-NDB (Non-Directional Beacon) Approach?

ANSWER: Yes, provided the Non-Directional Beacon is operating in the appropriate UHF frequency band. In the F-4, for example, sizable bearing inaccuracies can be expected at frequencies above 310 MHz. So, precise navigational operation should be limited to assigned ADF frequencies 264 to 284.9 MHz when using the auxiliary receiver, and to frequencies lower than 310 MHz when using the main UHF radio receiver. HI-NDB approaches in the UHF frequency band usually have the word (UHF)in the title as depicted in Figure 1.



CATEGORY	C	D	E
S-NDB	NOT AUTHORIZED		
CIRCLING	4940-2 1006 (1100-2)	4940-2¼ 1006 (1100-2¼)	4960-2¼ 1026 (1100-2¼)

HI-NDB (UHF) A

FIGURE 1: A typical HI-NDB(UHF) Approach depiction

QUESTION: How can I determine the distance to a Non-Directional Beacon without the aid of ground radar or DME equipment?

ANSWER: After tuning the UHF radio to the appropriate frequency, note the position of the bearing pointer. The number of degrees the bearing is deflected from the wing tip position indicates the magnitude and direction of turn required to place the pointer on the wing tip position. Turn to this predetermined heading, as dip error during turns causes erroneous bearing indications. Note the time at the completion of this turn, and maintain a constant heading until the pointer shows a bearing change of 10°. Note the time and determine the distance to the station by the following technique: Use one-tenth of the above time (in seconds) as the time to the station in minutes. If, for example, it requires 40 seconds to fly a 10° bearing change, the aircraft is 4.0 minutes from the station. (40/10 = 4.0) The distance from the station may then be computed by multiplying TAS or ground speed (in nautical miles/minute) by the time to the station in minutes.

EXAMPLE:

Given a ground speed of 420 knots

Nautical miles/minutes = 420/60 = 7 NM/Min

Distance to the station =

4 Min X 7 NM/Min = 28 NM

QUESTION: When is station passage determined using UHF/ADF procedures?

ANSWER: Normally, station passage is positively determined when the bearing pointer first moves through the wing tip position (90° or 270° indices for a no-wind condition). The only exception to this rule occurs during holding. Once established in the holding pattern, the first definite move by the bearing pointer past 45° either side of the holding course will be considered as station passage for timing purposes.

QUESTION: How is the length of the holding pattern determined for UHF/ADF approaches?

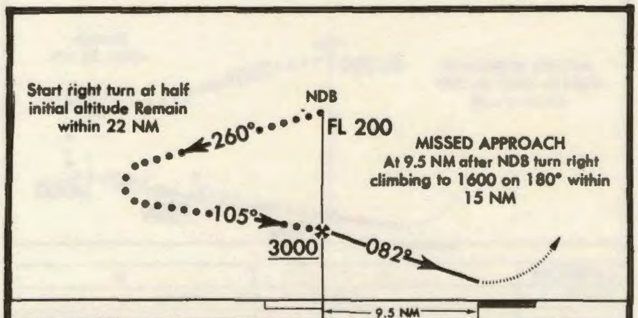
ANSWER: Use the VOR timing criteria found in AFM 51-37. The maximum inbound leg time is 1 minute if holding at or below 14,000 feet, or 1-1/2 minutes if holding above 14,000 feet. The initial outbound leg will not exceed the appropriate time specified above. The subsequent outbound legs should be adjusted as necessary to achieve the correct inbound time.

QUESTION: If arrival at the IAF is at an altitude other than published, when can I begin descent?

ANSWER: If arrival at the IAF is at an altitude below that published, maintain altitude and proceed outbound 15 seconds for each 1,000 feet the aircraft is below the published altitude before starting descent. If arrival at the IAF is at an altitude above that published, a descent to the published IAF altitude should be accomplished prior to starting the penetration (request this altitude change from the controlling agency).

QUESTION: When is the penetration turn started on a non-DME teardrop penetration?

ANSWER: Non-DME penetration turns should be annotated left/right turn at a specific altitude. Notice for the HI-NDB approach shown in Figure 1 that the start-turn point is specified as 11,000 feet. When a penetration turn altitude is not published, start the turn after descending one-half the total altitude between the IAF and FAF altitudes. One technique to determine the start-turn altitude is to add the IAF and FAF altitudes and divide by two. In the example shown in Figure 2, the start-turn point is specified as one-half of the recommended initial altitude or 10,000 feet. If the turn point had not



CATEGORY	C	D	E
S-NDB-9	680-1¼ 658 (700-1¼)	680-1½ 658 (700-1½)	
CIRCLING	680-1½ 658 (700-1½)	740-2 718 (800-2)	1100-2¼ 1078 (1100-2¼)
S-PAR-9	122-¼ 100 (100-¼) GS 3.0°		

NDB to Missed Approach 9.5 NM					
Knots	120	140	160	180	200
Min: Sec	4:45	4:04	3:34	3:10	2:51

FIGURE 2:

An NDB Approach depiction for start-turn points

been specified, the above technique would give a start-turn point of 11,500 feet

(20,000 + 3,000) ÷ 2 = 11,500

QUESTION: How are altitude restriction fixes determined on NDB approaches?

ANSWER: The NDB approach in Figure 3 illustrates three ways in which the point at which an altitude restriction applies can be determined.

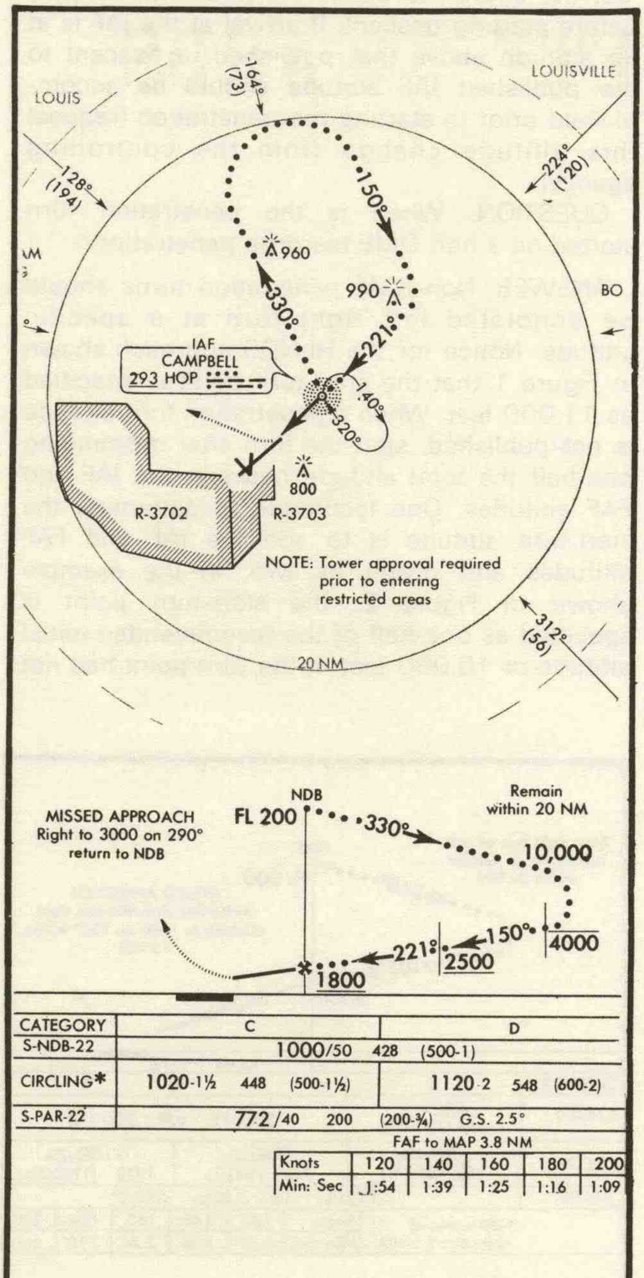


FIGURE 3: NDB altitude restrictions

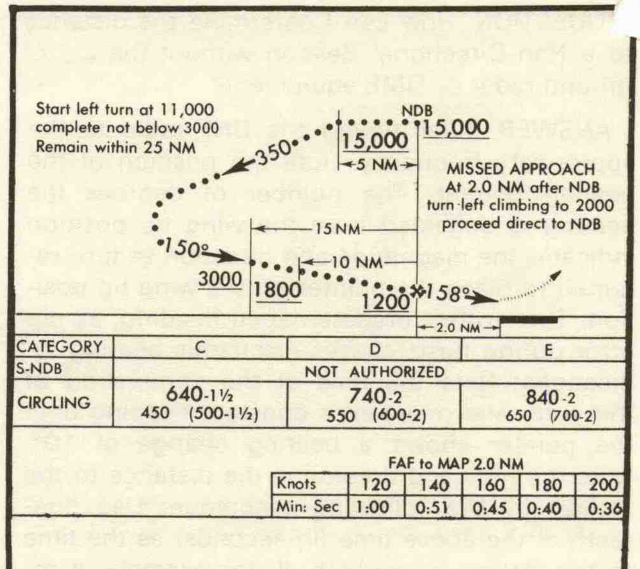


FIGURE 4: An interesting approach procedure

a. (Penetration turn altitude). If a penetration turn completion altitude is depicted (4,000′ in the example), comply with the applicable restriction until you are on course inbound.

b. (Course intersection). As shown in the example, do not descend below 2,500′ until established on the 221° course inbound.

c. (NDB FAF). The FAF may be determined by the NDB itself; do not descend to the MDA until station passage.

Using NDB procedures, see if you can determine at what point the 3,000′ and 1,800′ restrictions would actually apply for the NDB approach in Figure 4.

In general, ADF procedures for holding, high altitude penetration and approach, procedure turn and approach, and missed-approach are the same as those in the VOR section in AFM 51-37. Review UHF/ADF approach procedures and practice these back-up emergency approaches whenever weather will permit. It may turn out to be a worthwhile investment.

In reference to the NDB approach shown in Figure 4, there is not enough information shown to safely fly the approach as depicted since the point at which the restrictions apply cannot be determined. Study approach depictions carefully prior to flight ....

TAC

SAFETY AWARDS

MAINTENANCE SAFETY AWARD

Technical Sergeant Eugene C. Rein, Jr., 919th Consolidated Aircraft Maintenance Squadron, 919th Special Operations Group, Eglin AF Auxiliary Field No. 3, Florida, has been selected to receive the Tactical Air Command Maintenance Safety Award for this month. Sergeant Rein will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

TSgt Eugene C. Rein, Jr.

CREW CHIEF SAFETY AWARD

Airman First Class Rhonda Ginsberg, 834th Organizational Maintenance Squadron, 1st Special Operations Wing, Eglin AF Auxiliary Field No. 9, Florida, has been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Airman Ginsberg will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.

A1C Rhonda Ginsberg

A-7
Emergency Situation Training

by Major Wiley E. Greene
Arizona ANG

SITUATION: You've finished another humdrum A-7 ground attack range mission (Low Angle Strafe, Low Angle Low Drag, Low Angle Bomb, High Angle Bomb, REALLY High Altitude Dive Bomb, a Radar Bomb, and a Nav Bomb) and you're climbing out on your way home. You are IFR in the weather, the wingmen have tucked it in and you are doing superbly well. All of a sudden, your attention is drawn to the flashing Caution light. You calmly shift your gaze to the right console and notice that the "IMS" light is on. Whatta ya gonna do now, White Eyes?

OPTIONS:

A. Go to Hot Mike and tell the Sim Instructor to get off your case.
B. Give the lead to Number 3.
C. Call the SOF and ask him what to do.
D. Ignore it and it will go away.

DISCUSSION: Option "A" works sometimes but not this time. Option "C" isn't viable when you're in the middle of a cloud with immediate response necessary. Option "D" won't work either. That leaves "B." Why? ... I'm glad you asked.

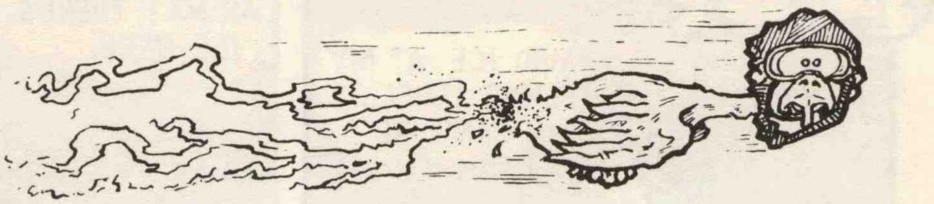
Did Number 2 join on the left side or the inside of the turn like a good ol 'boy (or girl, as the case may be)? And did Numbers 3 and 4 take the opposite side? Then if you give the lead to Number 2, you'll end up in echelon, in the weather, and I'll guarantee that Number 4 will not be happy.

Why give away the lead at all? 'Cause when the "IMS" light indicates a failure you can't rely upon the attitude indicator, nor the computer generated headings until they are verified.

Sometimes the failure is caused by a circuit in the power supply and information from the ML-1 is blocked. This inhibits all heading information and ergo, the standby compass becomes primary. So if you keep the lead you may be flying attitude on the "Golf Ball" (Standby Attitude Indicator), heading from the "Whiskey" Compass, and navigating off the PMDS. It's a lot simpler to wing.

→

TAC TALLY



	TAC JAN	TAC thru JAN 1977	TAC thru JAN 1976	ANG JAN	ANG thru JAN 1977	ANG thru JAN 1976	AFR JAN	AFR thru JAN 1977	AFR thru JAN 1976
TOTAL ACFT. ACCIDENTS ►	12	12	1	1	1	2	0	0	0
MAJOR ACFT. ACCIDENTS ►	0	0	1	0	0	2	0	0	0
AIRCREW FATALITIES ►	0	0	0	0	0	1	0	0	0
TOTAL EJECTIONS ►	0	0	1	0	0	1	0	0	0
SUCCESSFUL EJECTIONS ►	0	0	1	0	0	1	0	0	0

TAC'S TOP "5" THRU JAN

TAC FTR/RECCE

accident free months	
15	4 TFW
13	1 TFW
10	366 TFW
9	474 TFW
8	57 FWW

ARF FTR/RECCE

accident free months	
58	127 TFW
26	132 TFW
24	156 TFG
19	122 TFW
19	117 TRW

TAC/ARF Other Units

accident free months		
114	182 TASG	ANG
94	135 TASG	ANG
86	507 TAIRCW	TAC
83	193 TEWG	ANG
81	602 TAIRCW	TAC

MAJOR ACCIDENT COMPARISON RATE 76/77

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

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

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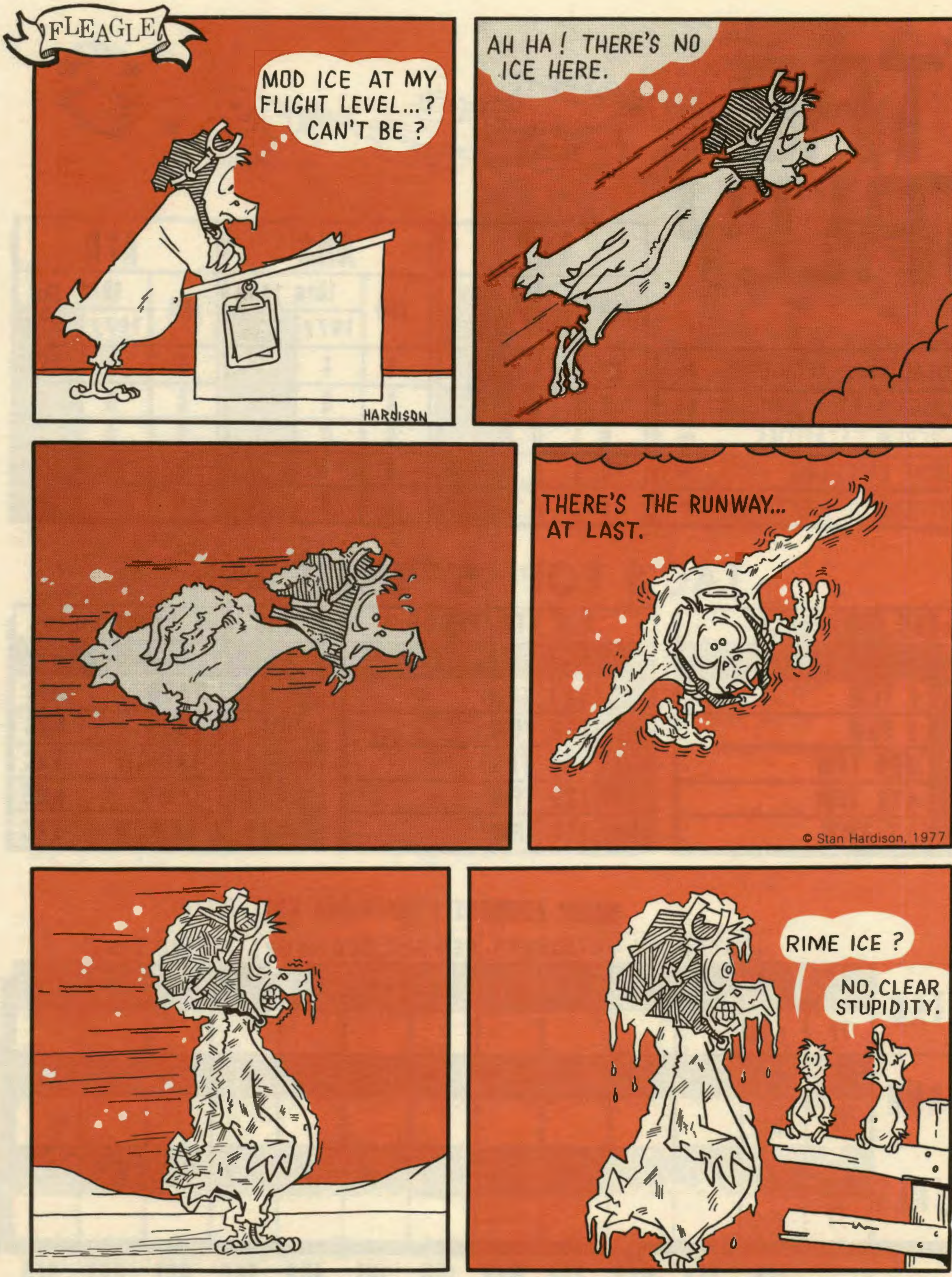
FLEAGLE
MOD ICE AT MY FLIGHT LEVEL...? CAN'T BE ?
HARDISON
AH HA ! THERE'S NO ICE HERE.
THERE'S THE RUNWAY... AT LAST.
© Stan Hardison, 1977
RIME ICE ?
NO, CLEAR STUPIDITY.