

23

TAC ATTACK

NOVEMBER 1974



SUPERFIGHTER Pg...4

NOW

FOR EFFICIENT TACTICAL AIR POWER



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Angle of ATTACK

functional manager involvement

It's easy to coin catchy phrases such as "total participation is the keystone to accident prevention." It's another task to achieve total involvement. An impossible goal? Probably, but how about supervisory participation or functional manager involvement? Both the supervisor and the functional manager have a legal and moral obligation to prevent accidents within their areas of responsibility. This legal obligation is outlined in several Air Force directives. In addition, every functional manager has a moral obligation to protect people and resources from needless risks.

Many functional managers have relied on the safety function for accident prevention in their areas of responsibility. Assistance certainly is warranted. Complete dependence is improper and has led to complacency — and a bit chunk out of TAC's budget. Worse, this type of thinking has led to injuries and deaths among the functional manager's human resources.

Managers have always responded to, and been responsible for, deficiencies within their functional areas. Safety deficiencies are no different. Any mismanagement

or lack of management results in a loss of resources and, in turn, a degraded combat capability. Logistics, Operations, Civil Engineering and other functional managers such as Personnel and Security Police must have the same concern to prevent unsafe practices and conditions within their areas of responsibility.

MAC does just that and has had very good results with a functional manager involvement program for on-duty ground mishaps. Since implementation in 1971, MAC has reduced on-duty mishaps by over 50%. During the same period, TAC has experienced almost a 50% increase. We plan to apply the idea across the spectrum of flying, ground and weapons safety. Be prepared for changes in TAC's accident prevention programs. Expect to see a lot more about functional manager involvement. It's a sound concept.

Accidents are bad business. Every supervisor and manager must get totally involved in accident prevention. TAC's combat capability depends on it. Our moral obligation demands it.

William J. Bally, Jr.
WILLIAM J. BALLY, JR., Colonel USAF
Chief of Safety

It's a bird . . . no, it's a plane. It's . . .

SUPERFIGHTER



by Captain Robert J. Hoag
Editor, USAF Fighter Weapons Review

TAC will get its first F-15s this month. Luke AFB will get the first Eagles, with Langley receiving theirs about one year later. To honor this newest addition to TAC's inventory, we are proud to reprint an article by the editor of the "USAF Fighter Weapons Review," Captain Robert J. Hoag.

Sports announcer Jack Whittaker said it on Super Sunday following Miami's most recent World Championship. "The Miami Dolphins equal awesome. Awesome is the Miami Dolphins." Two days after Super Sunday, I had occasion to conjure up an adjective, or five, or ten to describe another phenomenon of the 1970s.

We live in a world of superlatives where it seems every other team is the greatest, or every five years there is a "game of the century," or every other new car is the model you've always been waiting for. So, my problem was a real one where I was confronted with finding a way to realistically report on the F-15, the Eagle. The temptation to use the well-worn superlative is, at first, totally overwhelming. But the need for something straightforward, for something capable of bridging any real or mythical credibility gap, was enough to make me pause to reflect. Could anything, even the first generation

of new breed of Superfighter, be all that the advance publicity has made it out to be?

The Eagle's recent publicity has been nothing short of spectacular. However, cynics might have considered the sources biased. When Irv Burrows, McDonnell's chief test pilot, says things are going well — on time, on cost, meeting or surpassing specs — one might take it with a grain of salt. When Air Force news releases extol the Eagle's rapid development to puberty and beyond, it's understandable if the unbelieving raise their eyebrows. So it was long past due for a "nuts and bolts" look at a fighter pilot's airplane and the test structure that got the Eagle to where it is today.

My first impressions were nothing short of mind-boggling. "Awesome" is a valid adjective. "Tremendous" possibly understates the neophyte Eagle's proven capabilities. But to put things in their proper perspective, a statement from one of the TAC members of the F-15 Joint Test Force (JTF) possibly best states the case, "We've got us a pretty nice airplane. Problems, yes! Aggravating, yes! Insurmountable, no!"

Much mention has been made of TAC's involvement with the F-15 from the earliest design and drawing board stages. TAC people were in place at the Edwards Flight

st Center many months prior to the first flight of the Eagle in July 1972. From that date through 25 September 1974, there have been 2,517 flights. Included in that number are 259 Air Force flights, including 145 by TAC pilots. Among the flights by TAC pilots was a flight by TAC's Commander, General Robert J. Dixon. At the completion of his flight, General Dixon commented, "It's a very impressive air superiority fighter system. There can be no doubt that this aircraft system will give us a distinct edge. There is no air superiority fighter in existence that can match its combat capability, and air superiority over the battle zone is the key to effective tactical air power and air-to-ground combat operations."

TAC's participation in the overall design, in deficiency investigation, in human factors, in test development, and in analysis is designed to minimize and possibly eliminate major surprises during the formal Operational Test and Evaluation scheduled to commence in November 1974. Formal OT&E will be concurrent with the establishment of the first F-15 training wing at Luke AFB, Arizona. Even at this relatively early stage, the fruits of this TAC involvement in the F-15 development are bountiful. In the pages that follow, I think you'll make a brief acquaintance with a fighter pilot's fighter, designed for and capable of air superiority in any arena for many years ahead.

THE SUPERFIGHTER

So, where are we? So far, every test "milestone" has been met. The engine test, the most stringent ever required of an engine, was completed in October 1973.

After over 1,400 flights, I think it's safe to say that the USAF-McDonnell team can and has "pulled it off." The weight, cost, and performance closely approximate what was expected. As for complexity... considering the sophistication and capabilities of the Eagle..., the F-15 cockpit design and pilot procedures are simple and uncomplicated and require no more than average physical dexterity and common sense. I see this as THE one big step in the proverbial right direction.

Before we talk about the specific areas of cockpit layout, switchology, and air-to-air capability, there are a couple of areas that will make future F-15 drivers froth at the mouth. Lt Colonel Art Bergman, the senior TAC representative in the F-15 JTF, enumerated three areas where the F-15 has exceeded every expectation: thrust-limited military power performance, Control Augmentation System (CAS)-ON handling qualities, and radar performance and reliability.

Beginning with the last, the radar, in terms of capability and reliability, has out-performed what even the most optimistic planners had thought possible. The radar presents a computer-generated display which removes all except actual targets from the radar scope. What this means is that the radar picture is very easy to

interpret. Additionally, once the radar is turned on, all essential functions of the radar involving air-to-air tasks can be handled efficiently by the pilot without removing his hands from the throttles or stick and without looking inside the cockpit.

The second special area of excellence is the aircraft handling with the CAS engaged. The flight controls are a combination of a conventional hydromechanical control and what is in essence a "fly-by-wire" system of control augmentation. Either system is capable of flying the aircraft. CAS-OFF aircraft handling is similar to, but better than, F-4 stab-aug off handling. However, CAS-ON is the ultimate in aircraft power steering.

The flight controls are the conventional aileron, rudders, and stabilator. The rudders are mounted on the twin vertical stabilizers. The stabilator is differential and provides both pitch and roll control. As AOA increases, an increasing portion of any commanded rolling moment is provided by the differential stabilator. The precise rudder deflection necessary to coordinate these maneuvers is provided by an aileron/rudder interconnect. This eliminates the adverse yaw which was inherent, until now, in all swept-wing aircraft. Simply put, the nose of the aircraft goes where the pilot puts the stick, with the CAS telling the flight controls how much to deflect and when.

Now I know there will be some unbelieving souls with suspicious natures who will wonder what happens when some berserk electron decides to go on a rampage. Do not fear! The function of the CAS is to simultaneously measure control inputs exerted by the pilot and the aircraft reaction to these forces and then increase and decrease control surface displacement until the aircraft responds as commanded. This sounds a little like "black magic" since the CAS is capable of commanding large control surface deflections without the pilot changing stick or pedal positions. However, safety is built in by duplicating all CAS functions in each axis so that if



F-15 SUPERFIGHTER



one-half of the dual channel disagrees with the other channel, a failure monitor will disengage the CAS from the affected axis.

Sounds like something out of Star Trek? In reality, the CAS has proven to be extremely reliable and, although the system has undergone some modification and fine tuning, substantial flight testing has not revealed any undesirable characteristics.

Lt Colonel Bergman's third area where results are, as he says, "mind-boggling" is in the area of military power performance. I had heard all the wonderful words before but I felt a little like "doubting Thomas" on the first Easter.

So, when Lt General William Evans, Deputy Chief of Staff, Research & Development, USAF, came to Edwards for a demonstration flight, I went along in the F-4 chase aircraft. To say that the Eagle's afterburner takeoff was impressive would be an understatement of the highest order. You'll see what I mean when you consider the Eagle broke ground in about 1,200 feet and climbed to 10,000 feet by the time the aircraft ground track passed the runway 5,000-foot marker. After an outstanding demonstration of the radar's capabilities, it was time for the Eagle to show the stuff for which it was made. Ten to twelve thousand feet has always been a pretty good maneuvering altitude for the F-4. For the purposes of this demonstration, we used approximately 12,000 feet and

350 to 400 KCAS as a starting point. The Eagle was positioned co-speed at 6,000-foot slant range. The F-4 went hard right, sustaining 5-1/2 Gs, 20 units AOA, max AB, and the usual pounding buffet. The Eagle, being flown by General Evans, closed with considerable but controllable overtake to minimum range within 540 degrees of turn, with no buffet or other adverse handling characteristics and using only military power!

That the F-15 out-turned the old hard wing F-4 is not so surprising. But, that it did so with consummate ease in military power, maintaining sufficient Gs to stay on the inside of a 5 1/2 G turn while gaining airspeed, demonstrated to me that what we have here is truly a Superfighter. Although the afterburner envelope has not been completely explored, it appears that aircraft design limits are all that will restrict the aircraft's thrust-limited turning performance throughout much of the envelope.

One other maneuver is normally flown on these demonstration flights and it purports to be nothing more than a vulgar display of raw power. A shake of the head is about the only possible response to a transition from 110-knot gear and flaps down slow flight, to gear and flaps up, full AB and immediate pull up into an Immelmann. The Eagle accelerates throughout the maneuver!

THE COCKPIT

The cockpit is roomy and beautifully designed. The pilot feels as if he is riding astride the bird, rather than in it. This feeling of height is accentuated by a field of view which comfortably clears six o'clock low area. The canopy is bubbled sufficiently to allow the pilot to really bend around in the seat without crashing his helmet into



SMOKE TEST FLY-BY





the glass. The designers even made the stick long enough for it to be comfortable for human pilots.

As far as the cockpit layout is concerned, the switches and controls which the pilot frequently uses in his normal routine, are situated where he can get at them without having to change hands on the control stick. For example, the HUD, the UHF radio, the mode 3 IFF, and IDENT (position identification) controls are right in front of the pilot at the top of the center instrument panel. Changing radio frequencies, squawk or HUD display becomes a piece of cake even when you are BLUE 4 on a night/weather penetration.

Other items which require easy access are on the left console where the pilot can reach them by momentarily removing his hand from the throttles. These items include the radar control box (for setting special modes), the fuel dump switch, the ILS and TACAN controls, the landing light switch, a subsystem BIT control panel, the AUX radio, and IFF master controls. Significantly, the formation and position lights are placed directly behind the throttle quadrant where they can easily be reached.

The front instrument panel features an armament control panel which includes a gun rate control and a rounds counter, a missile status panel, master arm switch, and air-to-ground programming controls. Air-to-ground programming permits the pilots to select the delivery options prior to takeoff in order to minimize cockpit switchology problems while in the heat of battle. A combat jettison button is also available which permits jettison of all but the Eagle's air-to-air ordnance.

The radar scope is situated in the upper left corner of the front instrument panel. The standard flight director group plus standby altitude, altimeter, and airspeed indicators, take their places in the middle. The engine instruments are to the right. These gauges have some interesting innovations. For example, the RPM, EGT, and



fuel flow gauges present a digital readout along with the traditional pointer. The fuel quantity gauge measures all aircraft fuel (both external and internal) and it tells you how much fuel you have and where it is located within each tank group. Also included is an adjustable BINGO pointer, which flashes a BINGO warning light when this level is reached.

The right console features the engine control switches, i.e., the engine master switches, starter switch, and generator switches. Incidentally, if the pilot could pull the chocks himself, he could walk to the airplane, start it up, taxi, and fly without any ground assistance. The aircraft is totally self-contained. The Inertial Navigation System (INS) control panel is positioned on the right console. The INS system has been delivering accuracies in the vicinity of one mile per hour of operation and it permits the pilot to program up to 12 destinations. The cabin temperature and lighting controls are also located in this area.

THE THROTTLES

The F-15 throttles are considerably more than the aircraft go-fast levers. The right throttle is an especially busy piece of gear, containing the weapon/mode selection switch, the speed brake switch, the UHF switch, the IFF airborne interrogator switch, and the radar target designator control. That's the doofer that moves the acquisition symbols around and, when the target is bracketed, initiates lock-on when the isometric switch is depressed and released. With a few seconds practice, you can write your name on the scope using this switch.

The left throttle is the platform for the antenna elevation control, and the gun stiffen and missile reject switch. Both throttles include finger lift engine cutoff levers which also initiate engine motoring for engine start when the throttles are in the off position.

It is true the throttles are designed for busy hands. However, you do not need to be double-jointed or a

F-15 SUPERFIGHTER



contortionist to operate any of the controls. Fingertip pressures are all that is necessary to achieve the commanded results.

CONTROL STICK

Aside from the control stick being long enough for the average pilot, the stick grip has the usual number of buttons, but they provide additional services other than those which are familiar to the F-4 folks. For example, the weapon release switch or pickle button, located next to the trim button, fires or releases all ordnance except the 20MM cannon. The trigger has a double detent with the first activating the HUD camera. The second fires the gun.

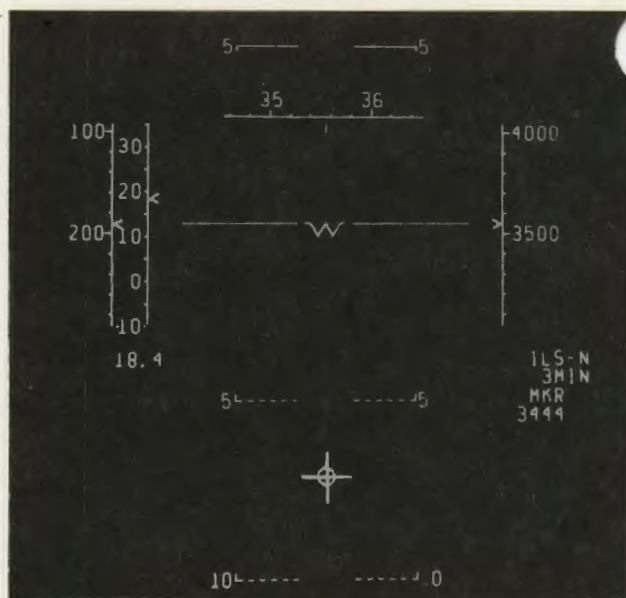
Although the F-15 has continuous nose wheel steering up to 15 degrees, the nose gear steering button gives the pilot a maneuver mode of 45 degrees of nose wheel deflection for taxiing in tight areas. In flight, the nose wheel steering button also uncages the AIM-9E seeker head.

The air refueling disconnect button still provides this function when it is depressed, provided the radar is in off or standby. However, in the Eagle, the AR button is a four position switch which is spring loaded to a neutral position. Pushing it forward commands the radar into a boresight mode in which the radar will lock-on to the first detected target within ten miles range. Pulling the button aft commands the radar into Super Search mode in which the radar rapidly scans the entire HUD field of view. In Super Search, the radar also automatically locks-on to the first detected target. In simple terms, in this mode you steer the Eagle to put the HUD on the target, and the radar does the rest. Depressing the AR switch with the radar in operate breaks any radar lock and returns it to the selected search mode.

AVIONICS

We've been a long time getting to the meat of the matter. But those of you who like saving the best for last should be pleased because the best is yet to come. The F-15 avionics package is amazingly sophisticated. This sophistication is made possible by a very intelligent Central Computer (CC). The computer is capable of performing 340,000 instructions per second and only weighs 48½ pounds. It is this small, lightweight, high-capacity computer that makes the F-15's one-man operation a reality.

Essentially, in the air-to-air role, the central computer prepares the radar, the weapons, and provides all

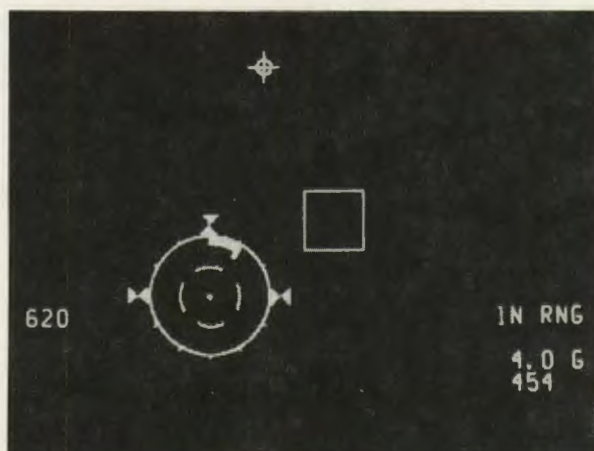


F-15 Superfighter

necessary computations for air-to-air weapons delivery. Of course, the pilot still owns the GO — NO-GO responsibility.

Basically, the mode of operation is selected by one of the three master mode selectors on the front instrument panel and by the GUNS position of the weapons select switch on the right-hand throttle. The ADI mode causes the HUD to display nearly everything that is available on the flight director, including heading, altitude, airspeed, pitch and roll information, a velocity vector (or flight path marker), pitch and bank steering and the distance to the destination commanded by the selected NAV mode. The radar displays whatever is selected by the pilot on the Radar Control Set.

The Visual Identification (VI) mode gives the pilot command steering via a steering dot within an ASE circle.



This steering information positions the aircraft behind and slightly below a target aircraft. This mode is also valuable for joining on a tanker or when reforming a flight at night or in the weather. When locked-on in the VI mode, the radar displays slant range in 1,000s of feet and rate of closure in knots.

Air superiority equates to air-to-air. Therefore, the primary avionics mode of operation is with air-to-air tasks in mind. In the F-15, all subsystems are automatically set in the A/A mode unless some other mode is manually selected. In this case, A/A is reselected in one easy step by placing the Weapons Select switch on the throttle to the GUNS position. The pilot, however, is in no way limited to the GUNS in his weapon selection. Once the Weapons Select switch has been positioned to GUNS, all manual selections are overridden. The pilot is then free to select either AIM-7s, AIM-9s, or he can, of course, leave the Weapons Switch in GUNS.

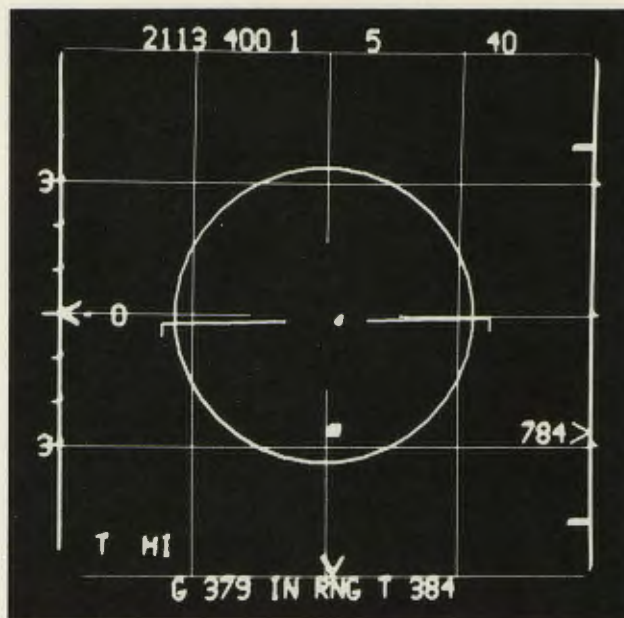
Anytime the pilot selects a weapon in the air-to-air mode, the central computer automatically commands the proper radar parameters and HUD and radar displays. Missile sequencing and prelaunch preparation or tuning are taken care of automatically. Furthermore, the gun can be fired anytime the Master Arm switch is on. There are no other switchology considerations.

GUNS

While maneuvering for a gun kill, the pilot does not have to take his eyes off the enemy. The radar is automatically positioned to 10 miles and radar lock-on is automatic. The HUD will display a 50-mil disturbed reticle with a 2-mil pipper. If locked-on, radar ranging is available merely by referencing the range analog to clock position. For example, if the range analog terminates at four o'clock on the reticle, your slant range is 4,000 feet. The CC computes and the HUD displays a Target Designator box which gives the pilot a line of sight reference to the target. This Target Designator box is a poor man's TISEO. Knowing where to look is half the battle; early indications are that visual acquisition will improve at least 20% using this line of sight designation. When the Master Arm is selected, a "Gun Cross" is shown on the HUD, indicating that the gun is armed. A digital read-out tells the pilot how many of the 940 rounds of 20MM remain in the gun. Triple Xs indicate the gun is empty. Again, no need to look in the cockpit.

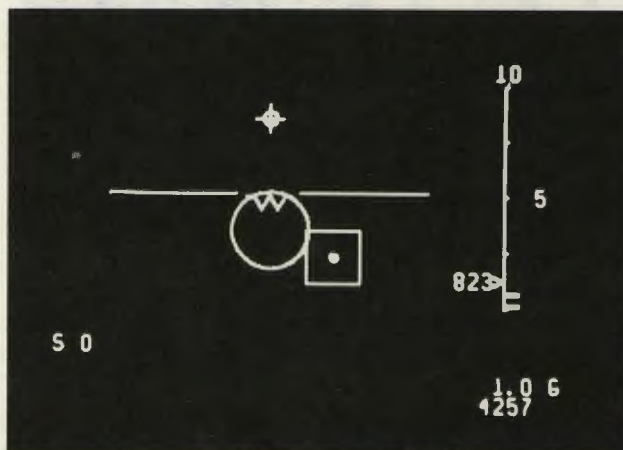
MISSILES

The center position on the Weapon Select switch brings to bear the Sidewinder AIM-9Es carried on the inboard wing pylon. The priority and status of all onboard AIM-9Es is displayed on the armament control panel. Selection of SRM commands the radar to the 20-mile range and again lock-on can be achieved automatically or manually.



As in the GUNS mode, there is no need to peek at the cockpit controls. The HUD displays all essential information. The gun cross indicates the Master Arm is on; the number of missiles aboard is displayed ("S4" means SRM is selected and 4 missiles are available); and R_{max} and R_{min} cues indicate the missile's optimum firing range. Range rate is digitally displayed adjacent to the range marker. An "In Range" cue (IN RNG) takes all possible doubt out of the matter and is displayed when the range cue appears between R_{max} and R_{min} . As before, radar tracking supplies a target designation box, aim dot and ASE circle. When the pilot uncages the Sidewinder's seeker head, the ASE circle expands to indicate the seeker head field of view.

The radar/HUD displays with Medium Range Missiles (MRM) or AIM-7F Sparrow selected are essentially the



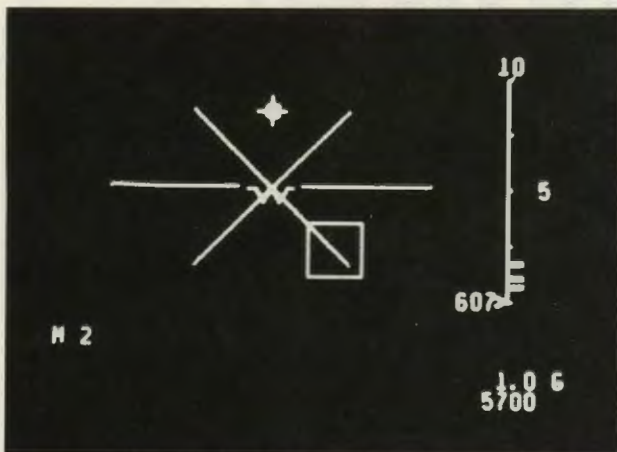
TAC ATTACK

F-15 SUPERFIGHTER



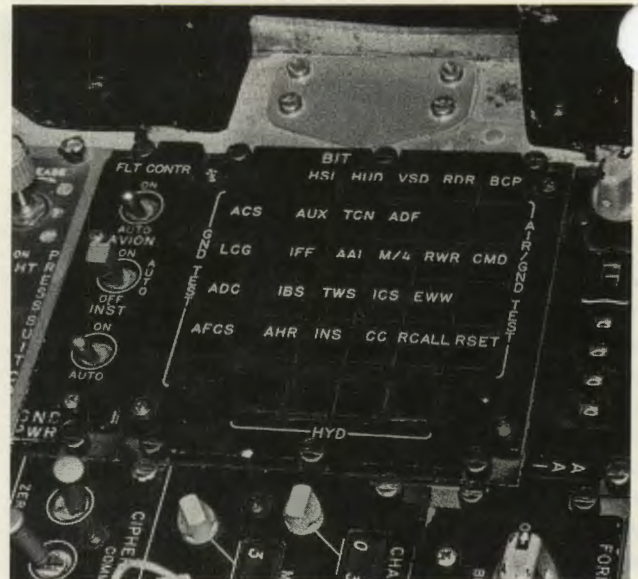
same as the previously discussed modes. In normal operation, the AIM-7s are automatically tuned when the radar is turned on. When the Armament Control Set receives a "tuned" signal, a "standby" is displayed on the armament panel. All AIM-7s will tune within two minutes. If they haven't or won't, they are removed from the firing sequence by the Central Computer. From this point on, any time MRM is selected and the Master Arm is turned on, a "ready" cue will be displayed on the armament panel for each tuned MRM. The missile is ready to be fired. The pilot has all this automatically available without looking in the cockpit. All necessary steering and/or status information is available on the HUD or the radar. The pilot is free to concentrate on maneuvering his aircraft and achieving an angle track lock-on. When in range, depressing the pickle button fires one MRM. The HUD then displays missile time of flight as a cue to the pilot to maintain radar lock for that period of time.

The entire air-to-air function is a simple, automatic process which frees the pilot to fly. The combination of skilled pilot, sophisticated Central Computer, and nimble Eagle should prove, for a while at least, to be an unbeatable and awesome team. HMM! The word 'awesome' sounds familiar.



CONCLUSION

Of course, we really are only at the beginning. The Eagle's destiny is before it and us. And I have not begun to scratch the surface of this aircraft's potential. Everything you have heard is true. The Eagle is all she's cracked up to be. I think so, and Chief Master Sergeant Robert Giese, Senior TAC Maintenance NCO, thinks so.



Chief Giese says of the F-15, "From a maintenance point of view, it is without a doubt the finest weapons system ever." Just a few of the items in the maintenance Christmas stocking include:

- Interchangeable major components. The required "on hand" stock will be greatly reduced because a considerable number of parts are usable on either side of the aircraft.

- Clean titanium engine bays afford quick engine change capability. Few, if any, subsystems are affected by engine removal.

- The number of specialized tools required has been reduced to a minimum.

- Each major component is capsulized so failures are isolated and do not affect other components.

- So far there have been low wear factors on what have proven to be very powerful brakes.

- An avionics status panel in the nose wheel well informs the technician of a malfunction in any of the avionics black boxes as well as box location. A latch on the individual box confirms the malfunction, and the unit, then, can be quickly removed and replaced.

The list can go on and on. Chief Giese feels the greatest advantage of having TAC maintenance in place at Edwards from the beginning is that maintenance factors will generally be determined prior to the establishment of formal OT&E and the first training wing.

So, in summary, the development and test have progressed nicely. Equally important are the education and understanding our TAC people are getting as a result of this early involvement. When TAC gets the Eagle this month, if the test history to date is any indication, we'll all be ready. No doubts, no misunderstandings, and best of all — no surprises.

TACTICAL AIR COMMAND

AIRCREW MEN of DISTINCTION

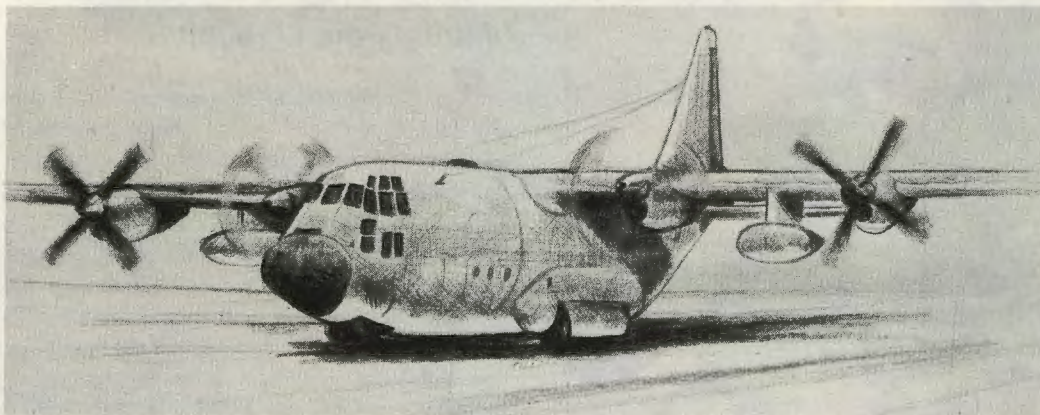


Captain Michael V. Long
314 Tactical Airlift Wing
Little Rock AFB AR



TSgt Thomas R. Robertson
314 Tactical Airlift Wing
Little Rock AFB AR

Aircrewmen of Distinction



Captain Long, an Instructor Pilot, and Technical Sergeant Robertson, Instructor Flight Engineer, were conducting Phase I training with a student crew. Captain Long, in the right seat, was demonstrating the takeoff since it was the student pilot's first mission in a C-130. He slowly advanced the throttles and released brakes.

At about 90 knots, with 10,000 feet of runway remaining, Sergeant Robertson observed that all four props had oversped and pitchlocked. He immediately told the IP. Captain Long initiated an abort, retarding all throttles to flight idle. At the flight idle position, all four engines were still producing 5,000- to 6,000-inch pounds of torque, indicating the props were still pitchlocked.

Quickly discussing the situation with Sergeant Robertson, Captain Long then brought the throttles to ground idle, but the torque remained high, indicating the props were not responding to throttle position. He then "throttle burst" the throttles to max power in an unsuccessful attempt to break the pitchlock.

With only 6,000 feet remaining and still at 90 KIAS,

Sergeant Robertson and Captain Long decided to shut down two engines. They shut down the outboards, using the "ground stop" position rather than feather, to reduce their speed with windmilling drag. Although still using maximum braking, the airspeed was still high at the three thousand feet-to-go marker. Captain Long again throttle burst the inboards in a final attempt to break the pitchlock. This time he regained control of the props and the throttles were placed in max reverse.

Captain Long was able to turn onto the run-up area and stopped the aircraft without further incident. The crew performed the ground egress procedures and quickly deplaned because of the extremely hot brakes.

Captain Long and Technical Sergeant Robertson reacted coolly and professionally to an extremely unusual emergency. Their quick reactions probably prevented the loss of both aircraft and crew. For this reason, they were selected as this month's Tactical Air Command Aircrewmen of Distinction.

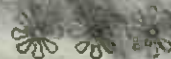
freezy rider

SAFETY
76

By Thomas W. Craig, TSgt, USAF
Safety Technician, 1 TFW/SEG

With the coming of cold weather, many motorcyclists will put their bikes in the garage for the winter. The others who ride the year round better start thinking about the risks involved in operating their motorcycles in cold rain, snow and ice. This is the most critical time of the year for motorcycle operation. The demands of steering, balancing and counterbalancing a motorcycle are increased, and all personnel should practice their expertise in handling a motorcycle while the good weather lasts. The following tips result from my past experience with winter motorcycle operations.

The most important rule to remember is to reduce your speed in bad weather. High-speed touring when the roads are slick has injured and killed a lot of good riders. Less experienced (and less confident) motorcyclists seem to know their limitations. Slow it down! Better still, stay off your cycle.

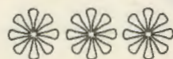


Physical protection during winter operation is a necessity that cannot be overlooked. Correct use of clothing is imperative due to the chill factors involved while operating a motorcycle in cold weather. For example, at 41 mph with an air temperature of +18° you're facing a chill factor of -30°F. In these conditions, exposed flesh can freeze in one minute! Without proper clothing, you can become excessively cold and your reaction time in an emergency is reduced to the point that you become a hazard to yourself as well as others on the highways. Clothing should be worn in layers so it can be removed or added to — as the temperature requires.

snowmobile suits and down-filled jackets are excellent for wear under leathers. Electrically heated socks and special cold weather gloves used by hunters and ice fishermen are excellent for winter motorcycle operation. They reduce the bulk of your clothing and let you still have the feel of the motorcycle. Rain suits provide excellent wind protection and keep you dry. Woolen toboggan caps can be worn under the motorcycle helmet to provide warmth



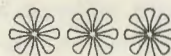
for the head and ears. Good boots are important for comfortable cold weather riding. They should be water repellent and insulated to provide maximum warmth and keep the feet dry. For total efficiency and alertness, a motorcycle rider should maintain proper body warmth and comfort so he can give his full attention to the road and its condition.



Good motorcycle accessories are important for effective winter motorcycle operation. Fairings, windscreens, and leg guards provide excellent wind, rain and snow protection. Saddlebags and tour kits provide dry, secure storage for personal items — and they keep the weight of cargo evenly distributed on the motorcycle. This makes it easier to maintain the balance of a

motorcycle on slick roads. Crash bars will provide protection for the rider and his motorcycle in the event that he loses control.

Maintaining clear vision during winter rides is extremely difficult because cold air can cause the eyes to water when they are unprotected. Face shields offer poor eye protection during the winter; they are open at the bottom and the hot air from breathing causes them to fog over easily. The best bet for eye protection and clear vision is the use of a ski mask and a good pair of goggles. The ski mask will provide good protection for the face, and the goggles will not fog over from hot air expelled from breathing. Tinted lenses are available in the better brands of goggles and will prevent snow blindness and eye fatigue.



There are several conditions to watch for during winter riding. The worst is known as black ice or ghost ice. This condition exists when a thin layer of ice forms on bridges and highways and cannot be seen until it is too late to avoid it. You might experience the same problem over the entire road after a freezing rain. This would be a good time to put the bike back in the garage and have a hot toddy.

Snowdrifts create extreme hazards when they form in curves and valleys. Tree limbs and electrical wires that are broken during heavy snow and freezing rain are of little danger to cars, but it is a different story when a motorcycle rider unsuspectingly encounters them on the road. Cross winds are a hazard that will be encountered during winter operations and can cause more difficulty than at any other time of the year due to reduced traction.

Since motorcyclists often cover long distances for hunting, camping and other off-the-road use, there are special hazards to watch for — such as snowstorms that hide hazards on the trails. Unforeseen snow storms can hide landmarks, making it very difficult for motorcyclists to find their way out of the wilderness. Remember, a heavy snowstorm can cover your tracks in a hurry. Motorcyclists who use their bikes for wilderness trips should tell someone where they are going and when they plan to return. They should also check the weather forecast for the period of time their trips will cover — keeping in mind that winter weather is very unpredictable. Sufficient survival rations and equipment should be taken so the rider could survive for an extended period of time. Motorcycling can be a rewarding experience — provided you use common sense and good judgment. If you reduce speeds, dress to meet the weather conditions, and know what to expect before you start, you will complete your trip in condition to plan your next one. Have fun! ➤

CHOCK TALK

chock talk ... incidents and incidentals

... incidents and incidentals

HALF-A-PIN

It is true that half-a-loaf is better than none, but in the case of aircraft safety pins, half-a-pin is worse than none. Standard safety pins (positive locking quick-release pins) are made of two main parts — the handle and the shank. When a safety pin is pulled, make sure you get all of it, not half of it!

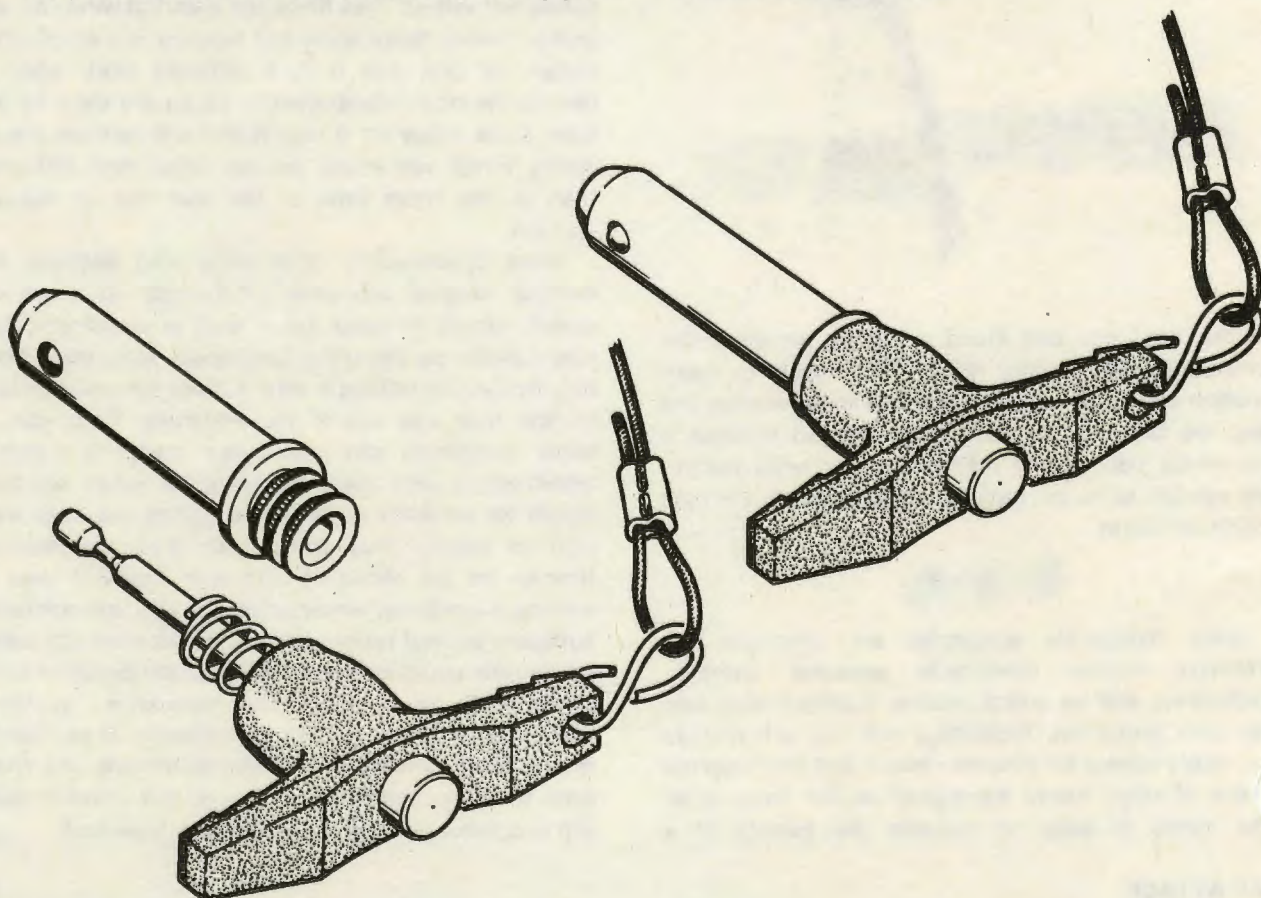
Normally, we would not complain about a broken safety pin, and surely a broken pin would not rate a magazine writeup. But such a pin recently caused an aborted flight, and since aborts cost money we thought we'd better alert you to the possibility on your own flight lines.

The pilot had taken off and because the landing gear

would not show full up and locked, he immediately returned. It took us a while to discover that the shank of the safety pin was still inserted in one MLG flipper door. The swaged portion of the handle had separated from the shank. The line mechanic had hurriedly pulled all pins prior to flight and failed to notice the pin had broken.

A quick inventory and inspection were made of our pins, and a number were found in which the shank could be rotated in the handle. Even worse, pins with broken internal springs were found. These pins require undue force to remove once installed. All questionable pins have been discarded here, and we recommend that field establishments make the same inspection.

Reprinted courtesy
McDonnell Douglas
Production Support Digest



with a maintenance slant.

WASH RACK WOES

TSgt Barry D. Shelton TAC/SEG

Aircraft don't sit under trees or taxi down dusty roads, but they get dirty just the same. You know what a job it can be to wash the family chariot, so you can imagine what's involved in washing a 40,000 pound fighter. A handful of soapy sponge just won't do the trick.

Many different, specialized chemicals, equipment and

procedures are used in cleaning our thin-skinned aircraft. In addition, safety equipment — aprons, goggles, face shields and sometimes even respirators are necessary to protect the man on the wash rack. All this gear serves a purpose. Example: A young TAC sergeant recently lost three duty days due to an eye irritation. Even though protective goggles were unavailable for use with his prescription glasses, he pressed on.

This troop was lucky. Instead of losing three duty days he could have lost the use of two eyes — and you're only issued one set. Use that protective equipment — it's for your own good!



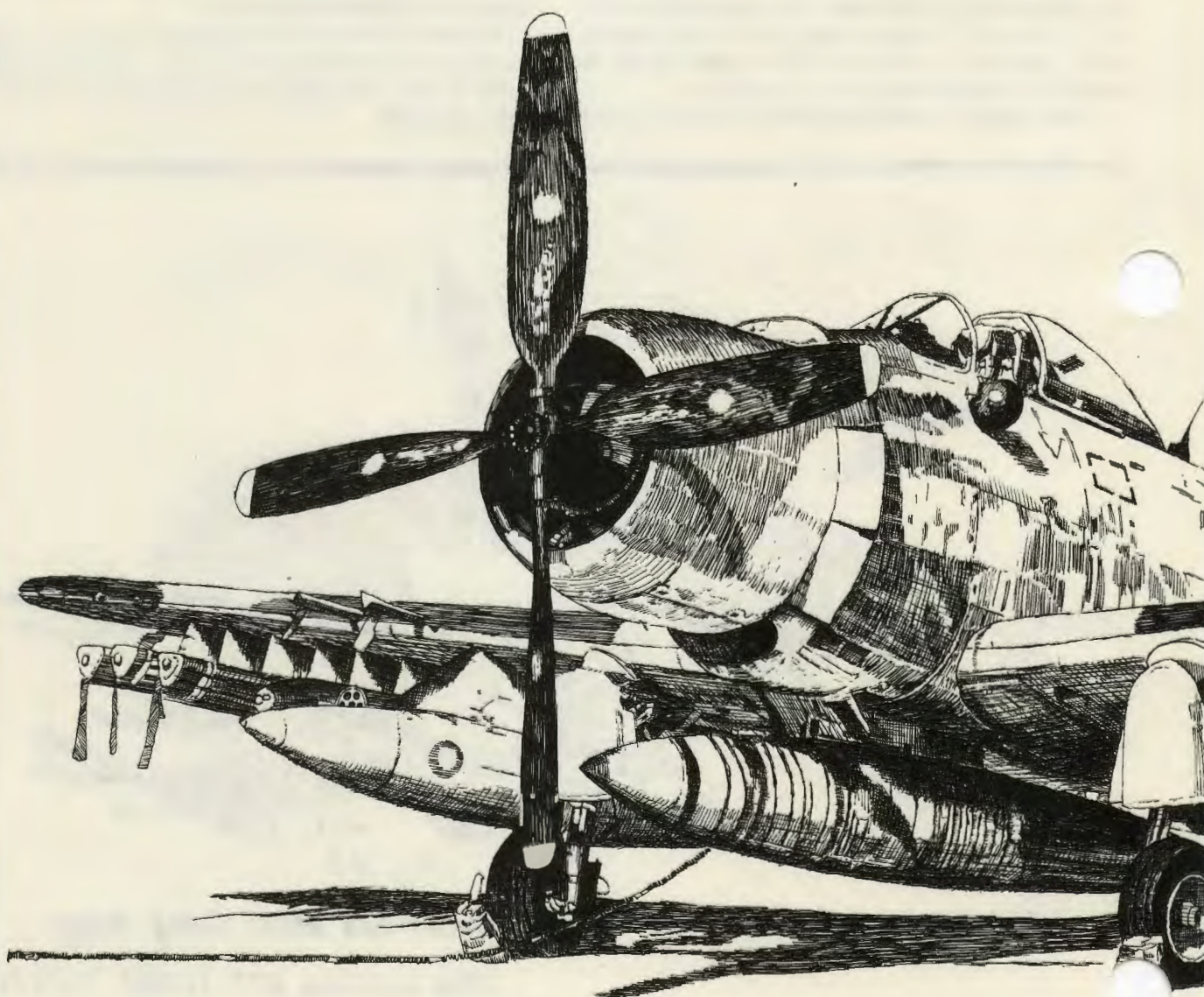
DROPPED OBJECTS are unhealthy for people and other living things.

Idea courtesy ATC FLIGHT SAFETY.

SKYRAIDER

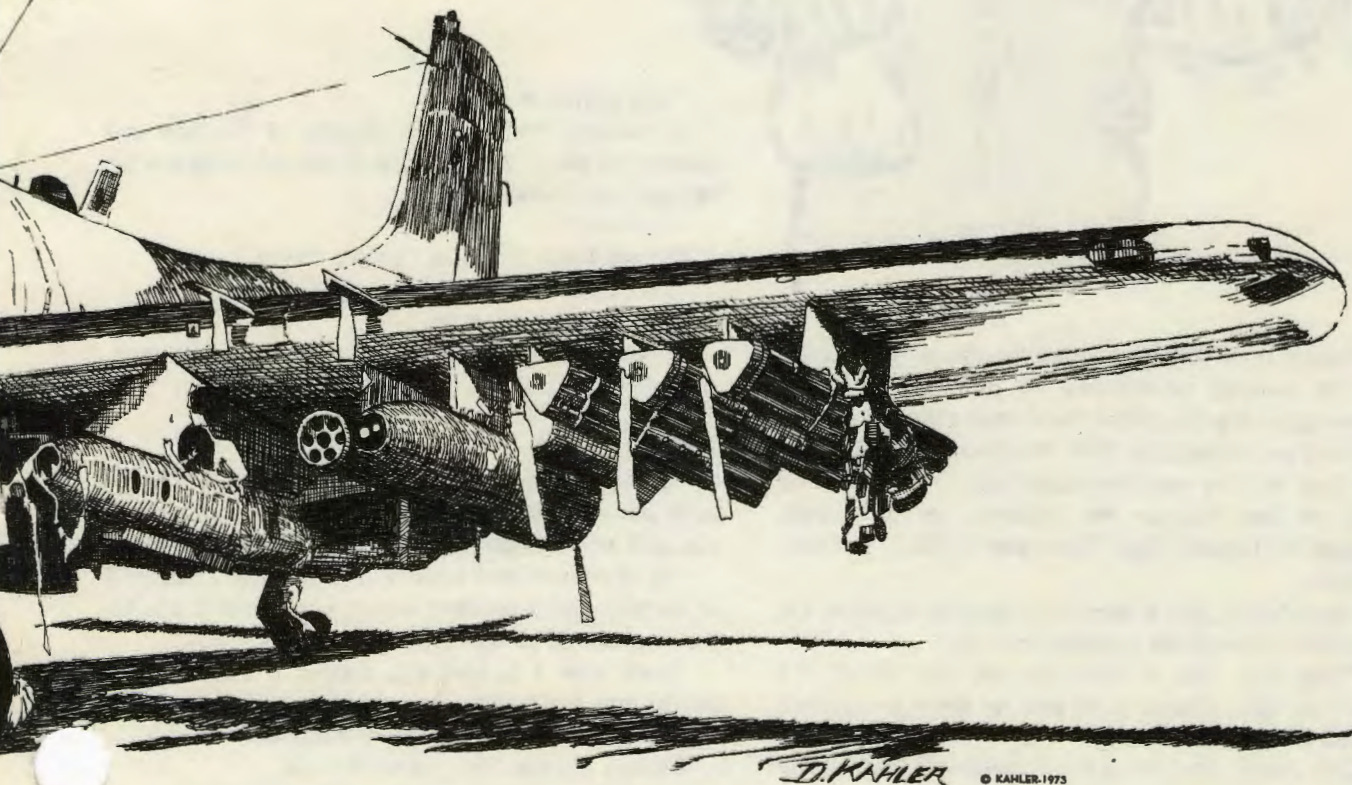
by Capt Mike Byers
HQ TAC/DOXBL

For the Air Commandos, who fought, and the VNAF, who are still fighting



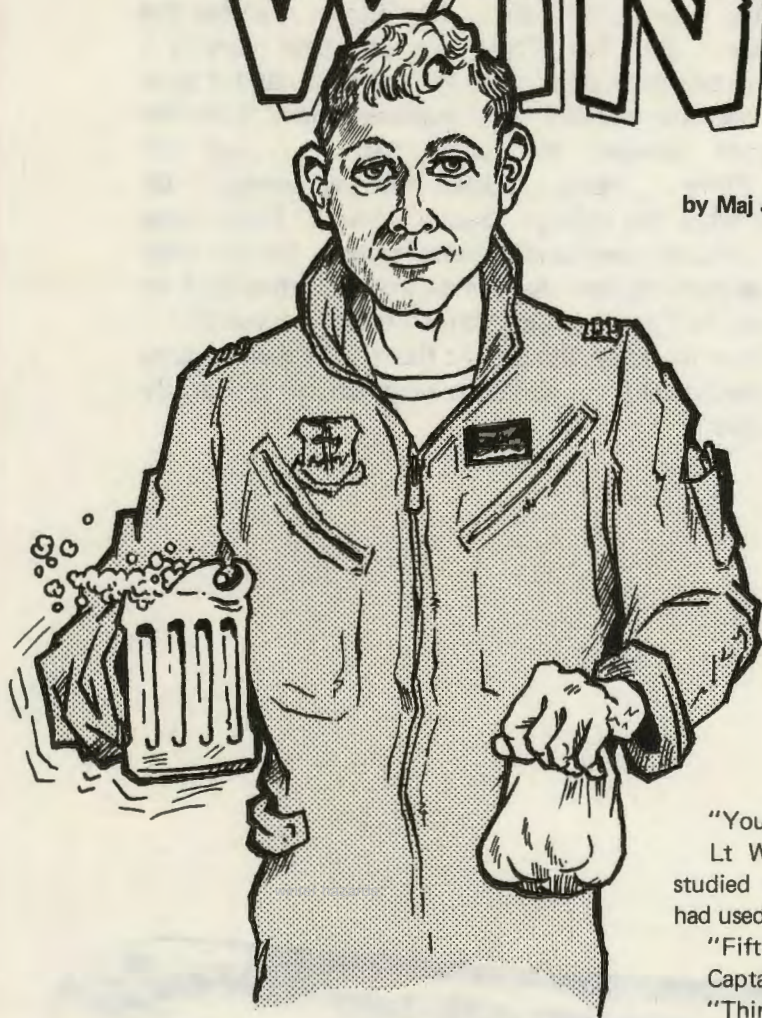
SKYRAIDER Super Spad . . . A-1 . . . Built for an older war, they found a place in Southeast Asian skies and in the hearts of men who dared to master two thousand seven-hundred horsepower. Remember how they flew at A Shau . . . Khe Sanh . . . across the burning Plain of Jars . . . Son Tay. They never asked for glory or a hero's place, but only one more pass . . . to fly and fight. And if your memory dims, go ask the infantry who watched them from the battle's ragged front beneath the jungle trees . . . ask the FACs—"Firefly . . . Zorro . . . Hobo . . . Spad, 'Hit my smoke!' " Or ask a rescued pilot what the callsign "Sandy" means. Their wings were stained with oil and twenty-millimeter cannon smoke; their valor was as bright as burning steel. And when they fell, they took an honor guard of enemy to tramp behind them on their final march.

Faintly, heard from far away, the distant thunder of their engines rises through the evening calm . . . phantom wingmen, off to war, fly with us now . . . forever.



WINTER

by Maj Joe Tillman



Our thanks to Col Ewald G. Kruggel, 12AF/SE, and the 366 TFW at Mountain Home AFB Idaho. Col Kruggel sent us a 366 TFW/DO letter that included most of the cold weather tips used in this article.

Captain Arch Toomey entered the smoke-filled casual bar, hat in hand; he stomped the snow off his boots. Elbowing his way to the bar, he ordered a large pitcher of beer and six pickled eggs. With the pitcher and a mug in one hand and the napkin-wrapped eggs in the other, he made his way through the crowded bar to a table occupied by Captain Siggy Torok and his WSO, Lt Frank Wooster.

"Hey, Toom, grab a seat! Set your gifts down on the table here. Our well has just about run dry."

"Gifts, hell. Get a dollar bill out, you cretin. If I remember right, I've gotta hit you for about six pitchers to break even."

Capt Torok took out a single, sneaked a peak at the serial number and waved the folded bill at his GIB.

"You go first, Frank."

Lt Wooster took a deep draught of flat beer and studied the bill — wondering if it was the same one Sig had used last Thursday.

"Fifty-one."

Captain Torok looked at Toomey. "High."

"Thirty-six," said Arch.

"Low. I got thirty-seven."

Lt Wooster, still studying the folded bill, frowned. "Forty-two."

"That's low," said Torok. "Toomey?"

"Forty-eight."

"Dammit," Captain Torok dropped the bill on the table and reached for his wallet. "How much do I owe you, you lucky bugger?"

"Another buck and a half will do, Captain Torok, and Lt Wooster and I certainly would like to thank you for your undeserved generosity. Have an egg."

Torok took a pickled egg, popped it into his huge mouth and his buddies grinned as muffled obscenities issued from somewhere back in his epiglottis.

Captain Toomey filled the three mugs.

"Did you guys catch the safety meeting today?"

HAZARDS

Torok wiped his chin with a napkin. "Yeah, I was there. Same old crap. Every year at this time, we get two hundred rules about winter flying. 'Check your aircraft for ice, watch for hydraulic leaks, check the struts, taxi slower, watch for low RCRs for takeoff and landing!' I've been there before."

Lt Wooster smiled and picked up his mug. "Siggy, if you recollect, a little refresher course in taxiing wouldn't hurt. On that stopover last winter at Pete Field, you pulled a beautiful 360 coming out of the chocks. In fact, it was so pretty the crew chief asked for an encore."

"Sure, Frank, but Jeez, that ramp was glare ice. You could've played hockey on it."

"Exactly, boss. That's why I suggested we wait awhile before we tried to get out of there . . ."

"Don't tell me you guys took off on that stuff?" Toomey's eyes were as big as the egg he had poised in front of his mouth.

"Naw, of course not," said Captain Torok.

"Couldn't," said Lt Wooster.

"Too icy?" questioned Toomey.

"No, jammed flight controls," said the GIB. "It seems we had a little water freeze up the ailerons."

By now Captain Toomey looked incredulous. "Didn't you de-ice the bird?"

"Hell no. They told us there would be a two-hour delay to get us de-iced," said Torok, "and we were told to get our tails home ASAP. We had already been there two days waiting out a blizzard that would make an Eskimo cry uncle!"

Captain Toomey waved to the bartender to draw another pitcher. "It sounds like you guys had quite a trip. And speakin' of trips, who's gonna' get this next round?"

Siggy took out another bill, this time a five, and started another round of elimination. This time Frank lost and as the GIB left to pick up the beer, Captain Toomey said, "You know, Sig, I thought George did a pretty good job with the briefing this afternoon. He made a few points ' hadn't heard before."

"Yeah? Like what?"

"Well, like when he mentioned that the ground crew

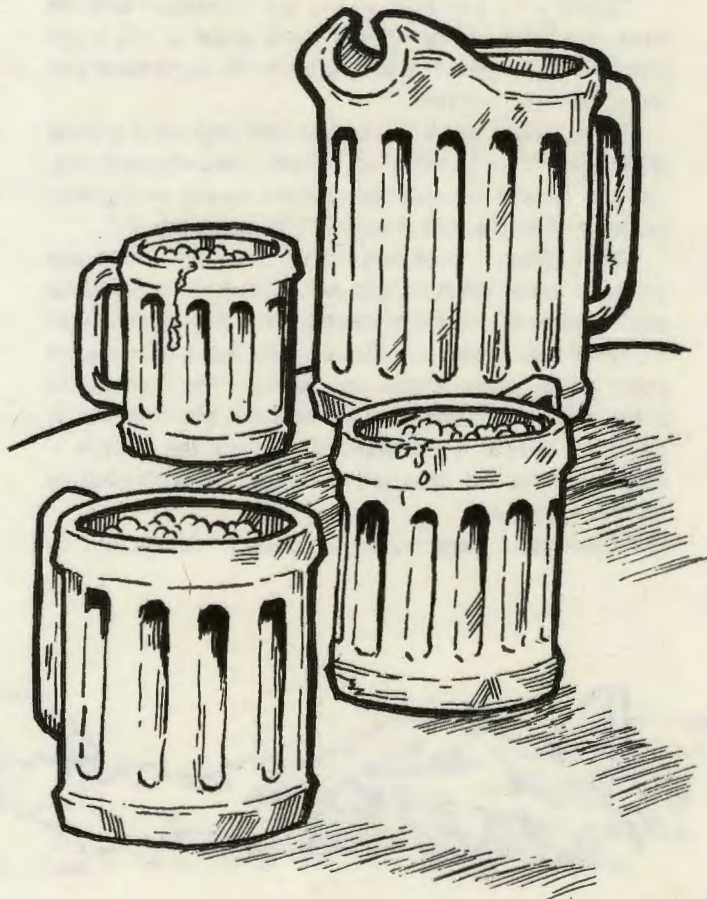
can't see worth a damn with their parka hoods on and to spend a little more time eye-balling for obstructions comin' out of the chocks."

"Hell, Toom, that's just common sense."

"Too true, Siggy, but I guess that's about all this whole game boils down to — but sometimes it's good to give your memory a shot in the arm."

Lt Wooster returned with the pitcher, poured a round and sat down.

"Who's shootin' who?" he said.



WINTER FLYING

"We were just talkin' about the safety briefing, Frank."

"Oh yeah, George brought out a few good points. That taxi accident he went over was really oddball."

"Which one was that, Frank? I must have been dozing."

"You know, Sig — the one where the number-two man skidded through his leader. It seems the flight before him had melted a patch of snow during runup and by the time this poor bugger got to the pad, he found himself running up on a skating rink... major damage to both birds. George pointed out that as long as we fly these forced-air heaters, we'll end up with patches of ice on the ramp and runup areas."

"Hell, everyone knows that, Frank."

Captain Toomey broke in, "Yeah, I imagine that number-two man knew it too, Siggy — he just forgot."

"But Jeez, Toom, it's going a little far to be limited to individual takeoffs when the runways are a little slick. How in the hell are we supposed to get any training that way?"

"Guess we'll just have to get our formation takeoffs when the patch is dry. If you think about it, it's kinda dumb to press when the field is slick. We don't have that many days like that here."

"Sure, Toom, but if Safety had their way, we'd ground all aircraft. It's a sure-fire way to get a zero accident rate. Jeez, ol' George even warned us about having more power available when it's cold. Imagine! Too much power!"

"Well, Siggy, I think you missed the point George was trying to make. What he said was, with low temperatures you're going to need less throttle to taxi — especially at the lower taxi speeds. He also brought out a pretty good point about single engine approaches. You'll get a lot more response — and yaw — from the good engine. It could get critical if you aren't smooth on the throttle — especially with full flaps and low airspeed. That's what he was talking about."

"Could be. I guess my biggest gripe is that we have an

annual winter flying hazards briefing whether we need or not. I think George has a special flag on his thermometer that tells him its time for his annual freezy skid-stuff briefing. A little white stuff and it's panic time...."

Captain Toomey interrupted him. "Speaking of snow, Siggy, I think I better get out of here before I'm stuck for the duration. The radio says we're gonna' get about three inches tonight."

Captain Torok finished his beer and he and his WSO stood up. "I'm with you, buddy boy. I gotta' give Frank here a ride home. See you later."

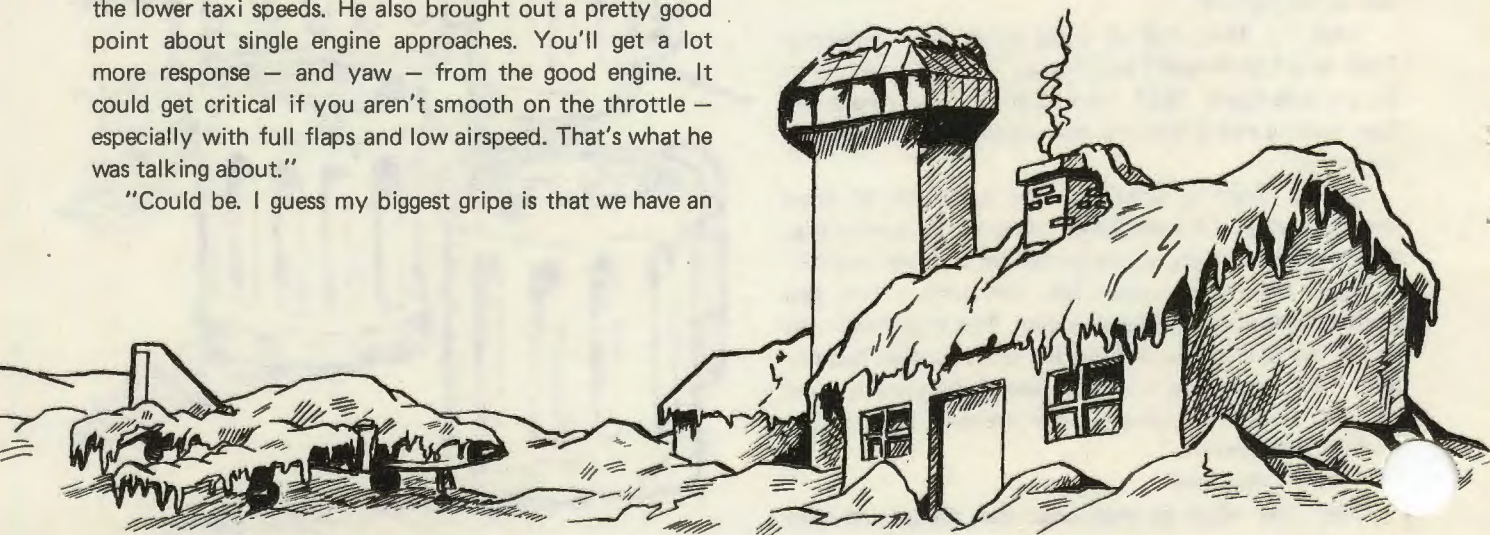
As the crew was walking out of the bar, Captain Torok pointed down the hallway. "Be right back, Frank. I gotta' hit the class six for a couple of bottles of antifreeze."

When he returned, they started out the door of the club and instead of watching the steps, Captain Torok looked up at the grey sky full of large blowing snowflakes. "Looks like Toomey was right, Frank. Look at the crud come down... OOPS!" Before the WSO could catch him, the big pilot went flying into the air and landed on his back — luckily, into a small snowdrift piled next to the sidewalk. Lt Wooster ran over to him — Captain Torok was flat on his back in the drift. The bottles, clutched tightly to his chest, were miraculously unbroken and a big snowflake had landed right on the end of his nose. He glared at his WSO ominously. "Frank, if you say one word about this to Toomey, I'll kill you. I swear this on the wart of my dead grandmother."

Frank, trying to suppress a smile, helped him up and brushed him off. "No sweat, Sig. Anyone can slip once in awhile. You've filled your block for this year."

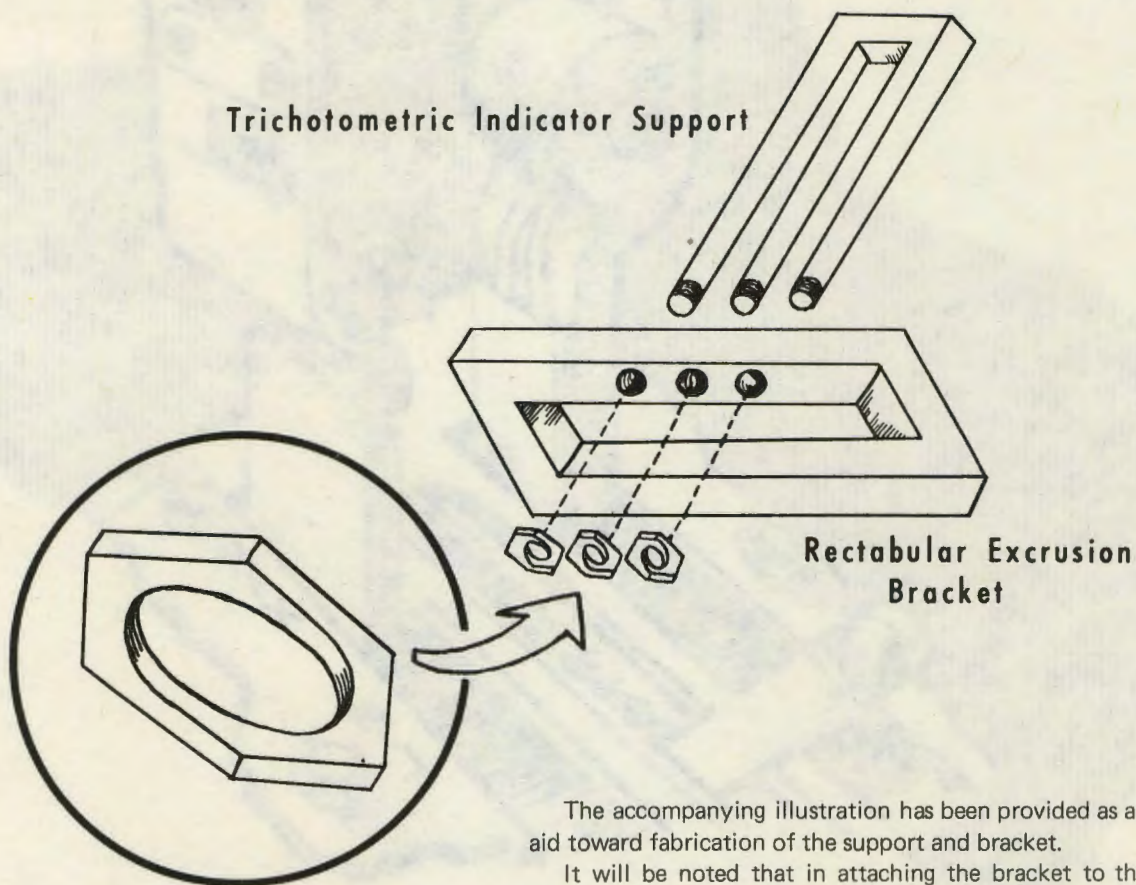
"Boy, you got that right. I forgot how slippery these steps are with a little ice on them!"

Frank grinned and slapped his AC on the back. "How soon we forget...."



THE TRIFIBIAL MODILLION

In the interest of providing our readers with the latest in ergonomic developments, we are providing a diagram of the trifibial modillion. It was developed in the basement workshop of the renowned inventor, Dr. Rosario Geddge, who made the quadrapotential framistan a household word.



Ambihelical Hexnut

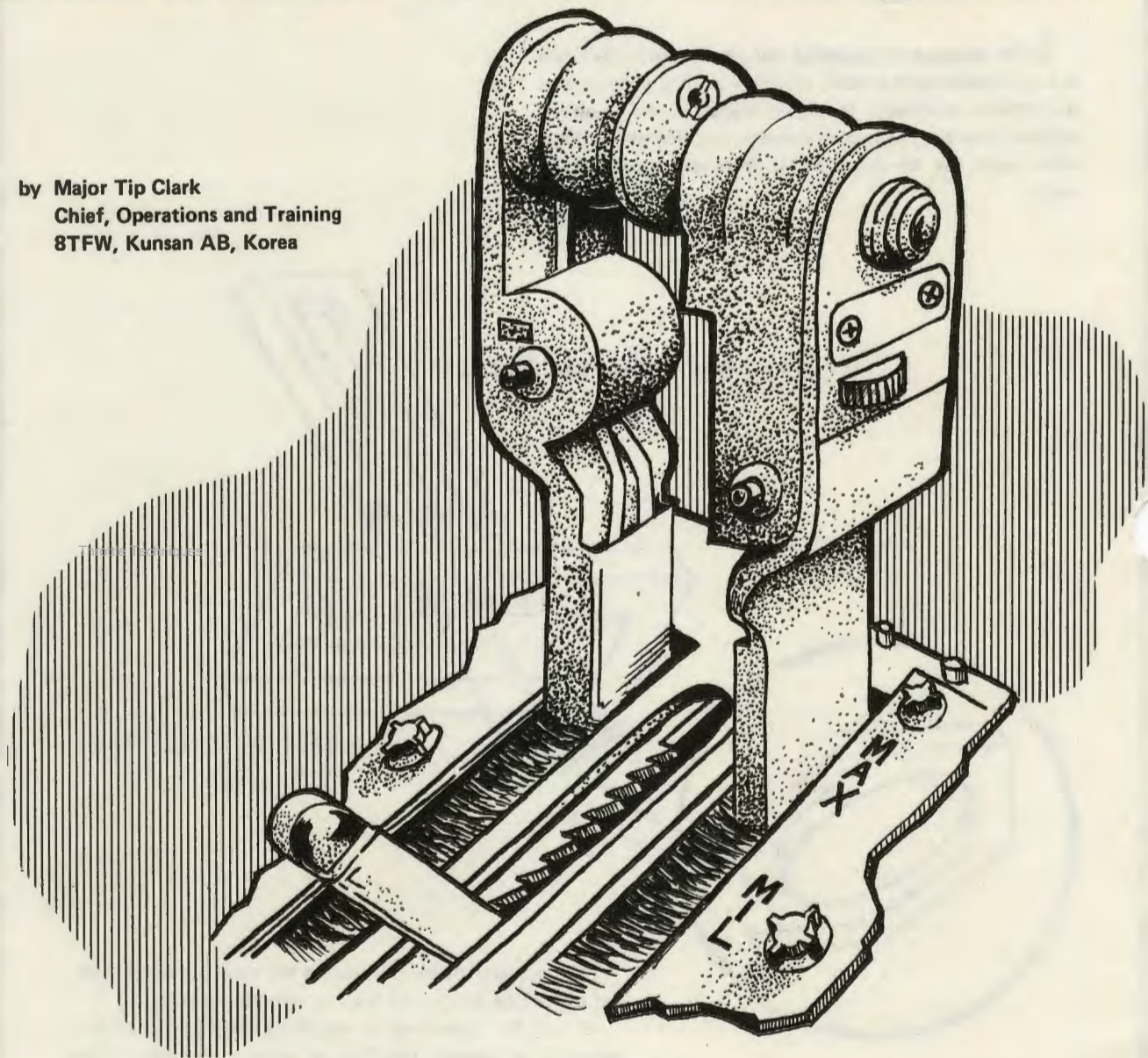
The accompanying illustration has been provided as an aid toward fabrication of the support and bracket.

It will be noted that in attaching the bracket to the support, a special ambihelical hexnut is used. The application of this nut is rather unique in that any attempt to remove it in the usual manner only tightens it. Because of this design, the nut must be fully screwed on for removal.

Treat those go-levers with care. There's a definite correlation between turbine blade life and . . .

Throttle Techniques

by Major Tip Clark
Chief, Operations and Training
8TFW, Kunsan AB, Korea



When was the last time that you, as a "Fighter Jock," changed an engine on an F-4? True, this may be a facetious question, but unless you have had some maintenance background, the answer is probably never. A

better question I might ask is: How many of you throttle benders have visited the engine shop at your base and talked with the folks who work on those turbo jet engines that push you around the sky? That is, what are some of

the problems that are encountered in maintaining jet engines?

With good throttle techniques, aircrews can do a lot to extend the life of a J-79 engine. With this in mind, I made a stop by the engine shop and started asking a few questions. I was welcomed with open arms and was quite surprised with the wealth of information they provided.

I certainly can't take credit for all the information I am presenting because there have been many articles, technical publications and briefings on this same subject. I do hope, however, that the information that I pass on will be thought provoking and result in some benefit.

You may or may not know that throttle bursts and chops can cause engine problems. In the old Hun days, I can remember running up the engine for takeoff and experiencing that familiar "chug chug." It was a reminding nudge to be smooth on the throttle. The first stage of the compressor was trying to stall out. And, remember those air combat maneuver missions in the Hun when you selected afterburner and that compressor stall blew your feet off the rudders.

Times have changed in that technological advancement has improved our jet engines so we don't have to worry about those "chug chugs" and teeth-rattling compressor stalls. However, that rapid throttle movement still causes some hidden problems to jet engines such as the J-79. I think we can boil it down to one thing: Overtemperature.

You ask: What's the big deal on overtemping? The answer: thermal fatigue. Thermal fatigue is local damage to a material, caused by repeated overstressing due to non-linear temperature gradients. In jock talk, that means that turbine blades, for example, expand and contract at a different rate as they are heated and cooled quickly. That's what causes the fatigue. Let's look at it another way. As mentioned in a recent General Electric Service Bulletin, heat is a form of energy. Any change in temperature to a material is called heat transfer. When heat is added, the molecular activity of the material is increased, and each molecule needs more room to move around. This results in the material expanding.

Now let's apply that principal to a turbine blade. The leading edge of a turbine blade is very thin, while the midsection is considerably thicker. The blades in a turbojet operate in an area where temperatures can be high and changes can be sudden. The edges, particularly the leading edges, are heated and cooled more quickly than the

thicker section. Since the leading edges of the blades expand and contract more quickly, the result is stress.

After prolonged and repeated stress, cracks appear and ultimately the blade breaks, similar to bending a strap of metal back and forth. This can happen during any hot start or any transient condition that causes exhaust gas temperatures to exceed normal levels in a short time or during throttle bursts or chops. In time, this can cause cracks in the leading edge and eventual turbine blade failure. Figure 1 shows a blade that has been overstressed and one that has broken due to fatigue.

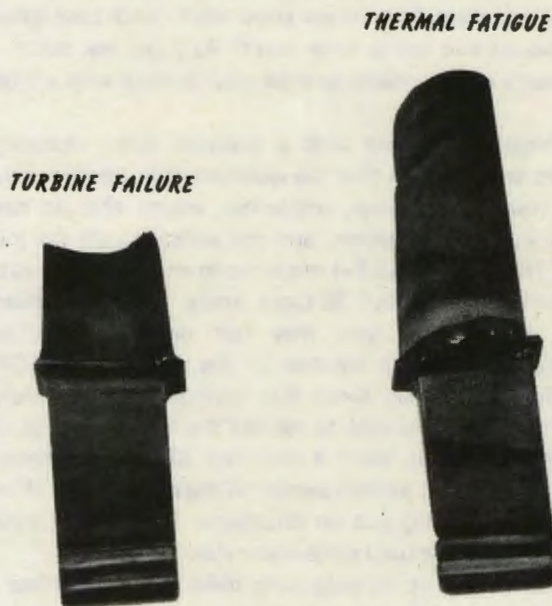


Fig. 1

Yes, we, as Jocks, can do something about this. We can reduce the number of sudden expansions and contractions by taking a little more time to advance and retard those throttles. I was surprised to find that a throttle chop creates a much worse condition than the burst. I might add that this applies in the air as well as on the ground.

I also did a little research in some technical publications such as GE's J-79 CIP Program Review. But, rather than quote you a lot of numbers and show you

throttle techniques

numerous graphs reflecting temperature changes and resultant stresses, I think I am safe in saying that one thing is evident. Throttle technique has a direct influence on turbine blade life.

Another bit of information I picked up at our engine shop is that there are presently two types of turbine blades — an older U-700 blade and a newer Rene' 80. Testing has verified that the U-700 blade is only good for about 290 full cycle throttle bursts and chops, while the new Rene' 80 is good for about 3750. That's a great improvement; but remember, these numbers are probably optimum and could be changed by certain conditions.

Most of our F-4s here have the new Rene' 80 turbine blades. However, how do we know which birds have these new blades and which ones don't? As jocks, we don't — and that's a good reason to treat your engines with a little TLC.

I began my article with a question about changing engines and I'm sure that the question didn't particularly turn you on. However, unplanned engine changes can affect you, the operation, and the ability to get the job done. Here's how. An F-4 requiring an engine change puts the bird out for about 36 clock hours. This could mean more sorties that you may not have available to accomplish all those squares in the new AFM 51-34. Additionally, it takes about 400 manhours to completely tear down an F-4 engine to replace the turbine blades. If you think about it, that's a little over 33 straight 12-hour workdays for one wrench bender in the engine shop. With the emphasis being put on efficiency. I think that time could certainly be used somewhere else.

Let me sum up by suggesting these few things. Don't make those sudden throttle movements if not required for the mission or for maintenance investigation. A 5-second acceleration is better than a throttle burst and a slow deceleration is better than a throttle chop. When we pull the Phantom, or any jet for that matter, out of the chocks or out of the arm/dearm area, let's take it easy. Except for the required throttle chop during engine run-up, the few extra seconds it takes for smooth throttle techniques during ground operations can do a lot to save your engines. The same thing applies in the air. Let's be smooth. That howl that the D makes in the base turn when you "sock it to it" may be music to your ears but the engine shop folks cringe at the sound.

An aircrew in combat may need to make sudden changes, but seldom are throttle bursts or chops required otherwise. Every one that you DON'T make eliminates that sudden expansion or contraction of the turbine blades and will mean additional life to the engine without blade cracks and failures.

Let's make this a briefing item on your next flight.

EDITOR'S NOTE —

Although this article refers to the Phantom, the turbine blade fatigue due to poor throttle technique applies to all jet engines. Unless you need rapid power changes, treat your go-lever(s) with respect.



Major Tip Clark's contribution
makes him this month's

**FLEAGLE T-SHIRT
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FLEAGLEGRAM



The Editor
TAC ATTACK
TAC/SEPP
Langley AFB, Va. 23665

HI GUY! I JUST WANTED TO DROP YOU A LINE TO INTRODUCE YOU TO THE LATEST WEAPON IN TAC'S SAFETY ARSENAL - THE FLEAGLEGRAM. YOU'LL BE SEEING THEM IN YOUR SQUADRON AND BASE OPS AND I HOPE YOU'LL USE THEM. IF YOU HAVE A GRIPE, WAR STORY OR SUGGESTION YOU THINK THE OTHER TAC HACKERS WOULD LIKE TO HEAR ABOUT, JUST SEND US A FLEAGLEGRAM. WE'LL USE THE PRINTABLE ONES IN TAC ATTACK AND IF YOU WANT YOUR IDENTITY KEPT SECRET, SEND IT ANONYMOUSLY. WAITING WITH BATED BREATH, I AM...

AERONAUTICALLY YOURS,

Fleagle
FLEAGLE

The purpose of the Fleaglegram is to aid in accident prevention. Although it is intended for use by TAC personnel, anyone with a gripe or idea that could prove helpful in preventing unsafe or hazardous situations is encouraged to participate. If you choose to remain anonymous, the Fleaglegram need not be signed. Simply fold the form so that the address is on the outside and staple or tape and mail at any address. This is not designed to replace or augment the Hazard Report Form (AF Form 457) in any way. All Fleaglegrams are accepted for TAC ATTACK magazine.

PHYZ-BIZ

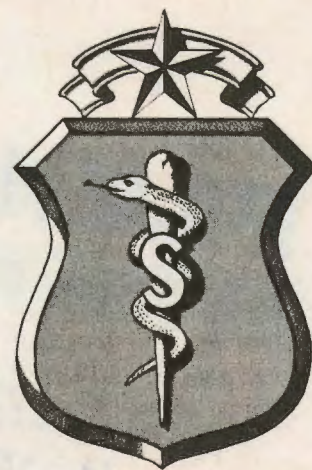
HYPOXIA: PART 3

LtCol Harold Andersen
Hq TAC Physiological Training Coordinator

In continuing our discussion of hypoxia, this month we'll take a look at the contributions that can be made by two popular pastimes: cigarette smoking and drinking alcoholic beverages.

The role of cigarettes as a causative agent in lung cancer is so well known and firmly established, that I won't dwell on it. However, the role of cigarette smoking as a causative agent in hypoxia is poorly realized, but for Air Force crews, may be no less important. So, let's take a look at its potential as a contributory agent to hypoxia.

The act of smoking a cigarette involves burning an organic substance (tobacco), tightly rolled in paper to control the rate of burning, and inhaling the smoke into the lungs. Under these conditions, the incomplete combustion of the cigarette produces the smoke (smoke is always an indicator of incomplete combustion) and also carbon monoxide (CO). Carbon monoxide is invariably a product of incomplete combustion of an organic material (fuel). It has a great affinity for the red, oxygen-carrying pigment in the blood stream (hemoglobin), so much so that even small amounts of CO in the air we breathe, or in cigarette smoke we inhale, will rapidly render an increasing fraction of the hemoglobin



incapable of carrying oxygen. This oxygen-poor blood does a marginal job of supplying body tissues and brain cells with the oxygen they demand. In most instances, the amount of hemoglobin inactivated by CO, even in a heavy smoker, will not exceed 10%. Even so, this results in a physiologic state with an equivalent altitude of about 5,000 feet, and the man is at ground level! Consequently, this crewmember will be less able to withstand the effects of altitude hypoxia (hypoxic hypoxia), and, not unexpectedly, that his TUC (Time of Useful Consciousness) at high altitudes will be diminished.

Since cigarette smoking and drinking alcoholic beverages seem to go hand-in-hand (so to speak — cigarette in one hand and drink in the other), and since we are beginning to realize that these insults to the body's physiological status are addictive, let's take a sidelong glance at ethyl alcohol and its effects. To begin with, there are a number of different types of alcohol — that's why I specified ethyl alcohol. Apparently, ethyl alcohol is the least toxic of the commonly available alcohols; methyl alcohol is a fine solvent and burns well under your wife's fondue dish, but drinking it can be disastrous! Methyl alcohol has notable effects on the peripheral nervous system, and "bootleg" or "moonshine" which has been laced with "wood alcohol" has caused permanent paralysis and blindness (it seems to have a particular affinity for the optic nerve). Isopropyl alcohol is "rubbing alcohol" and it's great for aching muscles if applied externally, but don't make the mistake of an internal application — it is nearly as toxic as methyl alcohol. So, ethyl alcohol seems to be the least toxic of the bunch, but it's not that safe. Just 1 or 2 ounces of "eth" can result in a detectable blood stream concentration which is capable of clouding judgment and reducing bodily coordination. The degree of disability increases as the concentration in the blood stream increases. When the concentration in the blood stream hits about 0.5% (that's 1/2 of 1%), the drinker is comatose (in a coma) and may die! Now, part



of the effects of alcohol are directly related to the ability of this chemical agent to reduce the ability of the body's cells to utilize the available oxygen (other effects are probably due to dehydration effects, etc.). There may be plenty of oxygen available in the blood stream and the delivery (circulatory) system is working normally, but the oxygen cannot be used by the cells because their internal chemical functioning has been disrupted by the alcohol. A little common sense will permit us to understand that the effects will be greater if we simultaneously reduce the amount of oxygen in the bloodstream by CO inhalation or cyanide poisoning so that they can't use whatever oxygen is available.

There must be a sufficient recovery time for the body to permit a return to normal. After a bit of partying, let nature step in to heal the wounds; a 24 hour period of abstinence from the bottle is suggested (from the weed, too, if you can stand it).

The human body is remarkably strong, flexible and resilient, but it has its limits. Exceeding those limits frequently results in irreversible damage, and accidents. Always keep in mind the additive features of these stress agents, and realize that your unique work environment (high altitude) demands careful consideration of your social activities and their effect on your physiological well-being and safety.

TAC TIPS

AN ELEPHANT IS A MOUSE
BUILT TO MIL SPECS

...interest items,

FOD FOR THOUGHT

Problems, like bananas, come in bunches. FOD is raising its ugly head again, and the toll in aircraft engine changes and manhours is on the rise. How about 87 reported FOD incidents in TAC the first eight months of this year. Cost? Over \$3 million! There are many areas where action can be taken to keep strange objects from entering engine intakes. TAC has intensive FOD programs aimed at preventing objects from being left around — followed up by inspections to remove trash that IS misplaced. Engine FOD, the most obvious (and expensive), is only one type of foreign object damage; another type is cockpit FOD.

Thorough cockpit inspections have discovered such varied items as nuts, bolts, safety wire, pencils, pens, survival knives, coins, flight caps, cigar butts, clip boards and flashlights. This trash is usually found under the seat, but often cockpit FOD is also discovered inside the throttle quadrant or in the flight controls below the stick, sometimes after the accident.



This junk can be just as dangerous as FOD ingested into an engine. It can cause inadvertent ejections, jammed throttles and binding flight controls. It can produce electrical failures, fires, and distractions in the cockpit during zero and negative g conditions.

Aircrews must insure the office they use is kept clean. Check to see that you leave the aircraft with the same number of items you had when you strapped in. If you KNOW you lost something, look for it. If you can't find it, write it up so the necessary search can be made.

The next guy to fly that bird will appreciate it.

F-111 PARTIAL ROTATION

By Major John P. Tillander, HQ TAC/DOVF

The Aardvark, number three in formation, released brakes 15 seconds after number two man. Engine performance was normal. At computed rotation speed (143 knots), the stick was moved aft and there was only a few degrees of rotation. When the pilot got no further response by about 150 knots, he initiated an abort. Clearing the runway, the aircraft was taxied to the hot brake area and an emergency was declared. About five minutes after clearing the runway, both main tire blow-out plugs blew.

No discrepancies were noted during a post-flight check of the flight controls, engines and instrumentation. An FCF was then flown without incident and the bird was released for flight.

This was the unit's second incident of this type in the last 18 months. A check with SAC and USAFE indicated the partial rotation or no-rotation problem is not a new one. In 1971, the Aeronautical Systems Division at Wright-Patterson AFB conducted an extensive investigation into the problem. Using this data, the unit has submitted an 847 for a change to the dash-one. Until you see it in print, we would like to pass on a little of the information that might save a needless and potentially dangerous abort. In section two of the dash-one, there are a couple of items worth repeating:

mishaps with morals, for the TAC aircrewman

"At 15 knots below takeoff speed, initiate back stick pressure to achieve a rotation rate that will result in a takeoff attitude *at the recommended takeoff speed.*" The italics are mine. For normal takeoffs, the desired 10° nose-high pitch may not be attained until you reach takeoff speed. Give it a chance.

A note in the dash-one follows, and I quote in part, "With a heavy aircraft and/or a forward center-of-gravity location, immediate rotation may not occur with aft stick movement and a much slower rate of rotation may be experienced. *In some cases, takeoff attitude may not be achieved until takeoff speed is reached.*" Again, my italics.

Finally, the study at ASD indicated that an early rotation or nose-heavy condition may cause the aircraft to partially rotate to about 5 degrees nose-high and hang at that attitude until takeoff speed is reached. Of course, crosswinds and turbulence (15-second interval takeoffs, for example) can cause the same partial rotation due to pilot roll inputs.

What we are saying is, if you only have partial rotation, wait until takeoff speed before initiating you abort. We are NOT saying to ignore unusual or drastic aircraft responses to your control inputs. If this happens, get on the binders. After all, that's what blow-out plugs and barriers are for, right?

STABILATOR WIPER PANELS -OR- FOR THE WANT OF A PIN A PANEL WAS LOST

Do you recognize the pin in photograph A? Probably not, you really shouldn't see much of it. Photograph A shows two of the pins properly installed. Can't see much, can you?

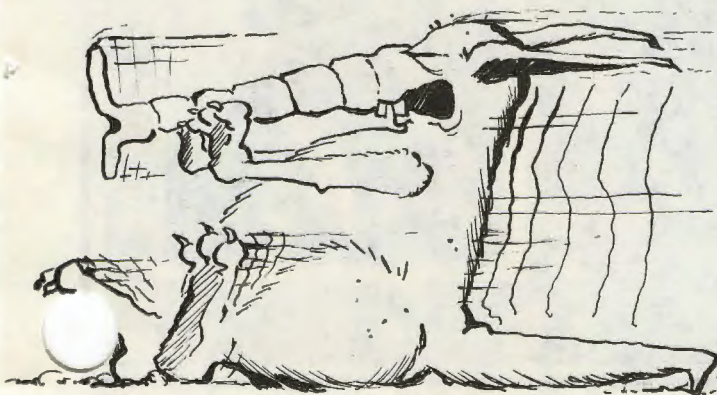
We recently lost the whole panel plus the round panel and screw. The evidence indicated the forward pin came out and then air loads ripped the panel off. If the pins are properly installed, they can't come out. (Note: They are also safety wired on the back side.)



Photograph B shows two ways to improperly install the pins. If you see this on preflight, don't take the aircraft or approve it for flight until the pins are properly installed.

I'd hate to be responsible for someone on the ground getting hurt by a falling panel which I knew was improperly installed. How about you?

Courtesy 58 TFTW "Flash"





TAC

SAFETY AWARDS

Maintenance Safety Award

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



SGT GILMORE

Crew Chief Safety Award

Airman First Class Hector F. Vasquez, 49 Organizational Maintenance Squadron, 49 Tactical Fighter Wing, Holloman Air Force Base, New Mexico, has been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Airman First Class Vasquez will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



A1C VASQUEZ

TAC TALLY



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

TAC		
SEP	Thru Sep	
	1974	1973
1	18	33
1	14	22
2	9	15
0	13	22
0	11	14

ANG		
SEP	Thru Sep	
	1974	1973
1	14	16
1	14	11
0	7	1
0	6	8
0	4	7

AFRes		
SEP	Thru Sep	
	1974	1973
1	6	1
0	4	1
0	2	2
0	2	1
0	1	0

TAC'S TOP "5"

FIGHTER/RECCE WINGS		
ACCIDENT-FREE MONTHS		
78	33 TFW	TAC
45	4 TFW	TAC
30	127 TFW	ANG
27	31 TFW	TAC
25	121 TFW	ANG

AIRLIFT/REFUELING WINGS		
ACCIDENT-FREE MONTHS		
111	440 TAW	AFRES
110	136 ARW	ANG
74	316 TAW	TAC
63	126 ARW	ANG
62	463 TAW	TAC

SPECIAL UNITS		
ACCIDENT-FREE MONTHS		
141	130 SOG	ANG
121	2 ADGP	TAC
102	143 SOG	ANG
90	DET 1, D.C.	ANG
66	135 TASG	ANG

MAJOR ACCIDENT COMPARISON RATE 73-74

TAC	73	5.0	5.1	5.1	4.2	4.3	5.0	4.8	4.4	4.2	4.1	4.2	4.1
	74	4.5	5.4	5.6	4.5	4.0	3.6	3.0	3.1	3.0			
ANG	73	8.5	8.6	6.8	5.0	4.7	5.1	4.3	4.2	4.6	4.2	3.9	3.7
	74	7.2	8.6	8.2	5.7	6.9	7.0	7.6	6.6	6.3			
AFRes	73	14.9	6.7	4.1	3.2	1.8	1.5	1.3	1.1	1.0	.9	.9	.8
	74	0	16.4	8.9	8.8	6.7	5.3	5.8	5.0	4.3			

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

FLEAGLE

