TAC ATTACK

(CAS)

SO YOU THINK... Pg 4

OCTOBER 1978

377

TAC ATTACK OCTOBER 1978 VOLUME 18 NUMBER 10



READINESS IS OUR PROFESSION

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TACTICAL AIR COMMAND

GENERAL W. L. CREECH COMMANDER

LT GENERAL JAMES A. KNIGHT, JR.

VICE COMMANDER

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COL RICHARD K. ELY CHIEF OF SAFETY

> CAPT PETE ABLER EDITOR

STAN HARDISON ART EDITOR

MARY KONOPNICKI EDITORIAL ASSISTANT

SGT DAVID GARCIA STAFF ARTIST

TACRP 127-1

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Distribution FX. Controlled by SEPP

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A KILL is A KILL

During any conflict, the primary objective is to obtain and maintain supremacy throughout the operation. The elements of TACAIR are dedicated to achieving this goal. To accomplish this end, we must neutralize the enemy's threat.

As an example, air-to-air engagements have always evoked a certain mystique. But the actual engagement is usually far from mysterious. The basic goals of any air-to-air confrontation are -to win and to survive. The numerical superiority of our potential enemies demands survival.

Angle of

Attack

A win can be achieved by shooting down the opposing aircraft; causing the pilot to lose control and eject or crash; running the enemy into the ground; or by causing him to run out of gas. The end is always the same -- the loss of a combat aircraft and a reduction of the enemy's combat potential. And it works the same for both sides -the enemy's objectives are the same as ours.

Today, our training programs are more realistic. We are working hard to improve pilot skill and situational awareness. We must work equally as hard to prevent our out-of-control and ground impact losses. We need to do more.

We are training to fight. Every aircrew, every aircraft we destroy reduces our chances if we have a future conflict.

A kill is a kill, whether it happens during -- or before the conflict. The results are the same.

Prehard K. El

RICHARD K. ELY, Colonel, USAF Chief of Safety



By Lt Col William S. Barnitz 162 TFTG (ANG) Tucson IAP, AZ

So you think it can't happen to you!!

Well, let me tell you, friend, if you persist in hanging on to that notion, sooner or later you will get a rude awakening from your dreamland.

Let's take a make-believe ejection/survival situation here in good old peacetime USA; make it about as miserable as you like and see what happens.

Now, let's see -- the squadron is up for night refueling and all you're scheduled for is Mobile. Piece of cake -- right? Until the clowns juggled the schedule and you ended up as number three in a flight going to the tanker. No bigee, though. You had time to get your data card filled out, review hazy items, and attend the full briefing. So, you're all set. Start, taxi, and takeoff were all standard; and you're on your way, over the mountains, in the dark, to the tanker.

Try this for the next twist. As you pass 19,000 feet, you lean back from adjusting your altimeter

and BANG! A loud noise and rush of air! Your airplane noses up and you instinctively push the stick forward. WHAM! ZOOM! You feel yourself crunched into the seat! TUMBLE! BLUR! POP! Your next conscious realization is that you are hanging in your parachute! Cold, shaken up, with no idea of what the hell happened or how you got there! And all you did was adjust your altimeter!

You remember your hanging harness routine and reach for the survival kit to make sure it's deployed. Don't want to do a PLF with that strapped tight. The handle isn't by your thigh so it must have deployed automatically.

Wonder when I'm going to hit the ground? It's darker than the inside of a whale. Can't see the ground. Can't steer either 'cause a four-line cut isn't a good idea in the dark. Can't see where to steer to anyway. Arm feels a bit funny. Ah, the ground is starting to show up a bit in the starlight. Best assume the PLF position and hope for the best. Suddenly you realize your helmet is gone!! And your gloves! Hey, come on, is my flight pay supposed to cover all this?

And then you arrive. CRUNCH! SLAM! FLIP! SLAM! OOOUUCHH! Slowly you gain enough

SO YOU THINK... it can't happen to you !

confidence to open your eyes. Well, you're alive and still in one piece. But you better check the pieces. Glad the head feels OK. Arms? The right one won't move! And the shoulder is hurting also. Legs? They feel OK. Try getting up. OOWWW! Right ankle is gone! Makes a funny crunching sound! Broken for sure! Damn!

Well, you decide to cool it and get on the radio and raise the flight lead and get yourself a wee bit of assistance. (Now, things are bad enough; but let's turn the screw another notch!) You find the kit lanyard and pull it in. Sure feels light. you suddenly come to the end of the line! NO kit! Just a frayed stub!! Hey guys, come on! Enough's enough! No radio, no nothing! What the hell is this anyway? Getting cold, too. Sure glad you wore that flight jacket!

But how the devil do you get the hell outta here? Aha!! Strobe light!! Small pocket on harness. Now where is it? Right arm hurts and won't move. Left hand is kinda numb. Got to at least sit up and find that light. Undo the Koch clips. Glad I practiced blindfolded on that "dragging harness" the LSO made up. Let's see, use the good arm to hold the bad arm up. Push, pull, there! Finally you get both shoulder harness clips undone and sit up.

Now where is that strobe light? Your numb hand goes around and around the tangle of harness and lines. Over and over. Finally -- there it is! But how the heck do you get it out? Can't unsnap it! OK, out of the harness, so you can get both hands on it. There! But it still won't unsnap. Bad arm, numb hand, cold, damn! OK, teeth! Pull harder! Got it! Now to push that weird bendy button. Come on, keep cool. There, it's finally working! Hear some airplanes! Hope they see this gadget. If they don't, it's just me, the dark cold, and the cactus in my legs, head, and back, 'til sunup!

OK -- how was that for a pipe dream created by a Life Support Officer dozing through the monthly Fly Safe meeting? Only one hitch. Every damn detail is true! It all happened on 8 March 1978, here in Arizona.

Now, if you're the average jet jockey, you can't have helped noticing the increased attention that has been placed on "hands-on" training with your life support and survival equipment. And for a very good reason. You, the pilot, are a valuable and needed part of the military team. Your availability and presence is wanted; not only by your wife, mother, kids, girlfriend, etc., but by Uncle Sam, the Air Force, and TAC! But even more directly. I'm sure you intend to stay around as long as you can just for your own satisfaction. So, don't put vourself in a bad corner by assuming "it can never happen to me." As long as you remain in this game, you are a player. And whether you like it or not, each player is periodically required to roll the dice. That's part of what your flight pay covers. Since there is no guarantee on the outcome, you'd best be prepared for the possibility of "crapping out."





SO YOU THINK... it can't happen to you !

To cover the possibility, do yourself a favor and make sure you attend and participate in the life support training that you get scheduled for. And make sure that training is hands-on and realistic! If it's not realistic, then get nose-tonose with the LSO and demand a change. It's your life he may be playing with. In any case, don't just fill the rectangle.

So how should you approach this training? Well, the basic premise you want to work on is this: You want to practice, under pressure, frequently, so that your nerves have established a "memory path" that is readily open from the brain to the arm/hand and/or leg/foot. No confusion over what to do. Just trained reactions through established "memory paths," even under stress and pressure.

So, do it in the dark! Do it upside down! Do it

on your back with your eyes closed! Do it with one hand, blindfolded! Do it with loud music, lights flashing, and someone screaming at you!

But, primarily, remember this. If you are suddenly faced with a situation similar to the actual one I've just described, one thing you can bet your bippy on is that neither the LSO nor any of the regs and directives he's supposed to train you from will be there with you as you float in the chute. Don't get me wrong about us LSOs. I think most of us try to do the job in a productive and beneficial way. But beyond a certain superficial level of training, it's not possible to force a pilot to participate fully in what's being offered to him. That's up to each pilot. Ultimately you'd best learn to protect your own aspirator.

So, like I said at the beginning, if you think it can't happen to you, try adjusting your altimeter.



AIRCREW OF DISTINCTION



Un 20 June 1978, Captain Teel and Captain Williams were practicing night landings on a night IP upgrade mission when their O-2A experienced a landing gear malfunction. During gear extension, the main gear stopped in a trailing position. The crew declared an emergency and were joined en route by another O-2A whose crew confirmed the main gear position as unsafe and reported that the nose gear appeared normal. The exact position could not be confirmed because of darkness.

While Captain Williams flew from the right seat, Captain Teel made numerous attempts to lower the gear with the emergency hand pump. Various electrical remedies were attempted but no change was noted in the main gear position. Captain Teel then unstrapped from the seat and removed a floorboard, checked the main gear position visually, and attempted to move the gear struts manually. While the action was unsuccessful in locking the gear down, it did verify that the main gear was free-moving. The crew then decided to try an unorthodox last ditch method to lower the gear. Captain Teel cut the third seat microphone cord and connected it to the tourniquet from his survival kit. While Captain Williams maintained minimum controllable airspeed, Captain Teel opened the rear baggage door and, in the darkness, tied the tourniquet to the gear strut. He then gradually routed the cord up the side of the aircraft to the cabin door. By swinging the gear in a pendulum motion, he was able to pull it forward into a position that appeared safe.

Since the cockpit indications still showed the gear unsafe, the runway was foamed in preparation for landing. Captain Teel, after flying a low approach to confirm the foam position on the runway, flew a straight-in approach, shut down the front engine on short final, and executed a flawless night landing on the foam. After shutting down the remaining engine, it was discovered that the nose gear was locked, but the main gear were not and might have folded.

The superior airmanship, coordination, and professional competence demonstrated by Captain Teel and Captain Williams averted possible injury to personnel and potentially major damage to a valuable combat aircraft. This exceptional performance qualifies them as the Tactical Air Command Aircrew of Distinction.



Capt Scott C. Teel 23 TASS/602 TAIRCW Bergstrom AFB TX



Capt Gary H. Williams 23 TASS/602 TAIRCW Bergstrom AFB TX



You cannot teach a man anything; you can only help him to find it within himself. Galileo

UNITED KINGDOM CONVERSION To JP-8

NATO bases in the United Kingdom are converting from JP-4 to JP-8 as the primary, and eventually the only, available jet fuel. JP-8 is commercial Jet A-1 with corrosion and icing inhibitors added. The purpose of the conversion is to reduce logistics costs and have one type jet fuel for both military and commercial use throughout NATO. Following the conversion of bases in the United Kingdom, planning will begin for the conversion of bases on the European continent.

JP-8 has a higher flashpoint and lower vapor pressure than JP-4. This will improve ground handling safety as well as aircrew survivability in the event of a crash. Also, JP-8 is less vulnerable to gun fire, and when ignited the damage potential and susceptibility to sustained external fire is significantly less than JP-4.

There are some inflight disadvantages with JP-8. The lower vapor pressure requires higher speed for airstarts. Flight tests of the F-15 with the F-100 engine have shown that an additional 25 knots are required for airstarts with JP-8 at 25,000 to 35,000 feet. Even so, all airstarts met the proposed F-16 airstart limits. The higher freezepoint of JP-8 is -58° as compared to -72° for JP-4. JP-8 could freeze during prolonged high altitude flights, particularly in unheated airrefueling booms or in aircraft tanks when sumps are not drained regularly.

Technical order revisions providing the operating and maintenance procedures for both ground and flight crews are being developed. JP-8 will be adopted Air Force-wide in the future, so all jet aircraft will eventually be affected. ...interest items, mishaps with morals, for the TAC aircrewman

HYPOXIA

During the cruise check on a cross-country flight, the F-4 pilot noted the cabin pressure was "a bit high" -- 22,000 feet MSL with ambient altitude FL 330. Neither crewmember thought the cabin pressure was excessively high, so nothing further was mentioned. A short time later, the cabin altitude rose to 24 - 25,000 feet and stayed there. Suspecting a slow leak, the pilot planned to descend should the cabin altitude go any higher.

Meanwhile, the WSO had removed his oxygen mask since it irritated his face; and when the pilot began discussing the next leg of the flight, he noticed that the WSO was very resistant to the discussion. Minutes later, when the pilot directed a radio change, the GIB acknowledged it but made no radio change. Checking the WSO in the mirrors, the pilot noted that his head was down. After directing the WSO to don his mask and to go to 100%, the pilot initiated a descent to 10,000 feet. The backseater recovered shortly thereafter, and the remainder of the flight was uneventful.

The investigators found that few aircrews could associate a given cabin altitude with an appropriate pressure altitude. Knowing that the pressurization system maintains a 5 psi differential is of no value to the airborne aircrew. The investigators also devised a rule-of-thumb to gauge whether or not your pressurization system is working properly. If you multiply the first three digits of the outside altitude by .4, you will approximate your anticipated cabin pressure. For FL 330, you will come up with 13.2, which lies in the correct range of 12.9 to 14.1. This formula only works for altitudes above 23,100 feet where the 5 psi pressure differential schedule begins.

Several lessons learned -- First, if your mask hurts you, get it fixed. Second, if you have to take your mask off, don't leave it off longer than necessary; and let the other guy know, so he can check up on you. Third, watch out for those seemingly minor malfunctions

PHLAPPING PHANTOM

Everything was normal on the day intercept training mission until takeoff roll. During takeoff, after approximately 1,700 feet of roll, the runway supervisor officer noted the outboard portions of both wings starting to rise. The RSO transmitted a call to the aircraft, but the crew did not hear it.

During the takeoff, the pilot stated that the nose of the aircraft came up sluggishly at first and then rose abruptly as they became airborne. Gear and flaps were raised, and the nose continued up as the pilot applied full forward stick and trim. After reaching 50 degrees nosehigh and 150 to 160 KIAS, the aircraft began to roll left. The pilot assisted the left roll with left rudder and gradually regained control of the aircraft, leveled off, and assessed the situation.

External tanks were jettisoned, the slats were locked in, and a controllability check completed. A straight-in approach was flown with touchdown at 180 KIAS, followed by an uneventful barrier engagement.

Post flight inspection revealed -- you guessed it -- both wing pins were in the up and unlocked position. The pins had not been painted red IAW tech data, but had, instead, been left up during aircraft painting, thus matching the camouflage color. This partially explains why the crew chief, aircrew, and end-of-runway crew failed to notice the pins in the unlocked position during their aircraft checks. The tech data for the crew chief's preflight also did not contain a specific check for a wing locked condition when the wings are extended.

The F-4E does not have a "wing unlocked" warning light as do the C and D models; so once the crew missed the indicator pins on preflight, the last available warning was gone. A proposal has been made to the depot to modify F-4Es to include a wing unlocked light, but no guick fix is in sight. This one came too close to a major smash. But for a bit of luck and the flying skill of the , crew, there would be a smoking hole full of F-4 parts just off the end of a runway. If you've adopted a ho-hum approach to the wing folded locking indicators



MELTED WINDSCREEN

Prior to taxiing from the chocks, the F-15 pilot noticed distortion at the bottom of the windscreen and aborted the aircraft. Investigation revealed that the safety wire for the anti-ice switch was broken, but failed to identify the time of occurrence or who accidentally turned the switch on. TCTO 838 will provide a deflector plate to prevent the windscreen from melting. Until the modification is complete, a double check of the safety wire for the anti-ice switches is in order.



Potsie: "Oh darn! Here we go again with the life support training."

Ralph: "Shh! Why don't you be quiet and pay attention for once?"

Potsie: "Ah, come off it, Ralph, what's new to learn about the PRC-90 or the signalling mirror? I know all about that stuff."

Ralph: "Potsie, things do change ... come on, listen up."

Potsie: "Yea, it's the same old training. Wake me up for lunch."

Infortunately, Potsie displayed a very normal response to the traditional instruction method for life support training. While there are few changes to aircrew survival and rescue equipment, the instructor needs to redesign the teaching approach toward the life support material. Innovation will capture the crewmember's attention.

In this area, the 388 TFW has restructured its life support academic program. The overall goal was to provide the most realistic training for the aircrews. The first step was to have the aircrews take a more active role in the training. The 388 TFW developed a survival training program for the local area. In conjunction with MSgt George Rabey, 2849 ABG survival instructor, a training scenario was developed for simulating "downed crewmembers." The area around Hill AFB provides many different geographic regions from the Salt Flats to the Wasatch Mountains.

The first survival exercise was held in the Magpie Canyon area in the Wasatch Range. This mountainous terrain provided an excellent training site for the participants and gave them a firsthand opportunity to evaluate the contents of the F-4 survival kit. The crewmembers were briefed on parachute utilization which included shelter and sleeping bag construction. No problems arose during the shelter construction after the crews were rebriefed on knot tieing.

Later that afternoon, the crews received a snare construction briefing. Each crewmember was able to build only five snares because of the shortage of wire. The survival instructors recommended that a minimum of 40 feet of snare wire would give the survivor a better opportunity to catch small game instead of the 20 feet presently contained in the F-4 survival kit. During the placement of the snares, the survival instructors noted that the survivors left behind their signalling devices. From that point to the end of the exercise, the crews were never caught without these devices. (After the exercise, this requirement was stressed during normal life support/survival training.) The exercise terminated the following day with helicopter vectoring and pickup procedures.

The survival instructors suggested that the F-4 survival kits carry at least two survival rations. Food contributes to morale and replaces substances burned to provide energy for the hard work of survival. Quoting AFM 64-3 (Survival): "Keeping well is especially important when you are stranded on your own. Your physical condition will have a lot to do with you coming out safely. Protection against heat and cold, and knowledge of how to find water and food are important to your health/ but there are more rules you should follow. Save your strength, avoid fatigue, get enough sleep."

A second training exercise was held a month later in the same location. The crewmembers were taught basic survival techniques with emphasis on shelters, fire building, ground-to-air signalling, and communications. On the first day of training, a heavy overcast forced immediate construction of a double layer parachute Aframe shelter. It rained all that night and part of the next morning. The crew, however, did an outstanding job of keeping themselves dry under their parachute tent.

A chopper pickup was made one-half mile from the base camp. Contact was made, but some problems were encountered when the PRC-90 didn't transmit but would receive. Signal mirrors did not have enough sunlight for effective reflection, and the MK-13 flares were not utilized due to a dry area restriction. The helicopter made visual contact with the survivors and a successful pickup was made.

The crewmembers on this exercise were well aware of the contents of the F-4 survival kit and the proper use of the equipment. The problem with the PRC-90 demonstrated the difficulties of relying on only one signalling system. Every means available to make yourself visible to the helicopter should be undertaken if the tactical situation warrants.

The final exercise of the year was held at the desert training site at the Little Mountain Military Reserve. Weather conditions were again

overcast with intermittent rain showers. The crewmembers were required to perform all necessary tasks to ensure survival. Special emphasis was given to shelter construction, signalling, communication, and recovery.

Shelter construction in the desert presented some problems for the crew. The lack of natural materials hindered their ability to stretch parachute material tight for a shelter. Two layers of material separated by an air space were used. In spite of moderately heavy rain, the crewmembers and equipment remained dry.

Consistent problems throughout all three exercises were vectoring and recovery techniques. As a result, increased emphasis was placed on vectoring and recovering procedures during the normal academic sessions. In addition, a new program was developed to cover search and rescue missions.

In November 1977, the first SAR exercise was conducted with the support of the 41 RWRW. Life support instructors were present to evaluate and critique the actions of the crews in this realistic survival training situation. Three geographic sites were selected for the exercise: (1) a mountainous region, (2) a rolling valley, and (3) a desert area.

The crewmembers were fitted with survival vests and carried only items normally contained in the F-4 survival kit. The first 2 hours were spent reviewing all the items in the vest. Signal-ling devices were checked to ensure that they were functional. The actual exercise kicked off at 0930. The first crew had difficulty with vector-ing. The rescue helicopter was positioned 6 to 7 miles east of the actual recovery site. After this



LIFE SUPPORT TRAINING



initial error, corrective action was taken, and the crew was able to vector the helicopter overhead for pickup.

The second crew also encountered difficulties with vectoring. They attempted to vector the helicopter by the sound alone. Being positioned in a valley, the echoes made it extremely difficult to accurately determine the location of the helicopter. The survivors made no attempt at communications when the actual location of the helicopter was in doubt. This prevented the helicopter crew from getting an ADF position on the survivors. The situation was corrected finally by the instructor who advised crewmembers of the correct procedures. (This demonstrated that actual field conditions will point out significant problems that can occur in an actual survival or recovery situation.)

This third group had no problems vectoring with the rescue helicopter, but the area presented severe problems for the crewmembers and the PJ. The sand blown about by the rotary blades resulted in one crewmember and instructor receiving flight abrasions on the eyes. Both individuals did have their visors down during the helicopter pickup. This did not, however, offer enough protection. To correct the situation, sungoggles (8465-00-530-4083) are being evaluated for inclusion in the F-4 survival kit. This item together with the helmet visor, will give the crewmember additional protection in desert regions, as well as other possible harmful geographical areas.

Throughout the exercise, medical problems were simulated to provide the PJs some realistic training. The problems ranged from simple shock to a broken back. This required the use of not only the forest penetrator, but also the Stokes Litter device for recovery. The entire exercise provided realistic training for the F-4 crews, the PJs, and the rescue helicopter crews. The overall effect was to install confidence in the capabilities of the entire SAR program.

The overall objective of the 388 TFW Life Support Program is to attempt to achieve the most realistic training environment for the crewmembers. While this program does not replace the standard academic routine, it does provide on-the-spot evaluation of rescue techniques and procedures. The lessons learned in these training situations will probably be remembered longer than any classroom presentation. It carries the concept of "training the way we'll fight" one step further.

Racket Sports and Eye Injuries

By Wg Comdr Michael D. Miller, RAAF HQ TAC/SGPA

Racket sports (tennis, badminton, squash, and racket ball) have shown a great increase in popularity in recent years. Paralleling this increase in popularity has been a dramatic increase in the number of eye injuries caused by these sports. During 1976, for example, over 3,000 players in the U.S. suffered eye injuries; many of which caused permanent damage and impairment of vision. Between one and three aircrewmembers are lost to the Air Force every year because of serious eye injuries resulting from participation in these sports.

Racket sports can be divided into two groups: those in which the opponents are separated by a net (tennis and badminton), and those in which the combatants share the same playing zone (squash and racket ball). In the first group, the greatest injury potential is from the projectile (tennis ball or shuttlecock); with some added threat from a partner's racket when doubles are played. In squash and racket ball, however, a major hazard is added by the racket and body of the opponent.

A number of injuries have been caused by a shot fired in anger or frustration. Control of temper on the court coupled with alertness after the point is over can help in avoiding such injuries. Severe injuries also occurred during warmup periods when more than one ball was in play on the same court.

The most effective method of reducing the eye injuries caused by racket sports is the use of eye protectors. An eye protector should absorb the energy from the racket, ball, or shuttlecock before the eye is struck. The unprotected eye is vulnerable to the total force of the blow. Since contact lenses transmit the impact directly to the eye, they are valueless for protective purposes. The requirements for the protector vary with the energy potential in question.

In squash and racket ball, the player is vulnerable to great forces both from the ball and the opponent's racket. Conventional glasses are not sturdy enough to withstand these forces: and for these sports, those who wear spectacles are advised to wear industrial plastic safety lenses mounted in a sturdy frame (industrial or athletic). Squash and racket ball players who do not wear spectacles or who wear contact lenses should wear an eye protector. Testing has shown that commercially available eye protectors and industrial plastic lenses mounted in sturdy frames can withstand the impact of most racket blows. Several players reported direct blows to eve protectors and safety glasses, with no resulting eye injury.

Tennis and badminton players probably have less risk than squash and racket ball players. Although ordinary glasses offer tennis and badminton players considerable protection, this is less than complete. For better protection, it is advised that tennis and badminton players observe the recommendations made for squash and racket ball. However, if tennis and badminton players have only ordinary glasses, it is safer to wear these glasses than to play without them.

Data show that injuries are not affected by the experience of the player. Good court manners and good defensive play, coupled with a device to prevent the projectile or racket from hitting the eye, are the difference between a serious injury and a blow that is hardly noted before play is continued.

The prevention of eye injuries in racket sports is a goal that can be achieved with relatively little effort. The benefit gained, both in terms of suffering and disability prevented, as well as in the saving of medical costs far outweighs the modest cost of preventive measures.



... incidents and incidentals with a maintenance slant.

MURPHY FIRES GUN

During a normal airborne armament check to insure that the gun on the F-15 was "safed," the gun fired 12 rounds -- luckily over the open ocean. The pilot quickly safed all switches and headed home.

Investigation revealed that during three or more previous missions, the rounds counter/ limiter had been set at "no limit." This allowed the gun to rotate when the trigger was depressed. Film of the Heads-Up Display (HUD) from two previous missions indicated the gun had rotated on those flights. It was theorized that vibration from the rotating gun eventually loosened the gun clearing cam holdback tool which had been in place on preflight.

When the holdback tool broke loose, the download pin also sheared. The red streamer from the electrical safing pin caught in the gun feeder mechanism and pulled the safety pin far enough to allow firing voltage to the gun. The result -- 12 fired rounds.

Sounds like Rube Goldberg figured the whole thing out doesn't it? Where Murphy lives, nothing is impossible.

PHODDED PHANTOM

An inexperienced crew chief was launching an F-4 on a routine training mission. During the normal launch checks, he failed to disconnect the aircraft grounding wire prior to taxi. The grounding point was located directly in front of the left main gear; and when the wheel taxied over the wire, the wire was pulled taut, bending the plug. The plug soon failed, and the tension on the wire whipped it and the plug in front of the aircraft. The greedy J-79 gobbled up the plug to the tune of \$15,300+. Pretty expensive meal



CANOPY BREAKER TOOL VS PROP By Capt Garry Mueller HQ TAC/SEF

And the winner is ... the breaker tool. Although designed for emergency egress, a canopy breaker tool was recently used to open some oil cans. The oil was poured into the rear engine from on top of the wing, and the breaker tool was inadvertently left on the wing. During subsequent ground operations, the canopy breaker was blown from the wing and hit the rear prop, causing a big nick in the prop. Not only was the prop damaged, but the canopy tool was also lost. Please, guys, we don't use your oil spouts to break canopies, so don't use canopy tools to ... etc.

AIRCRAFT TIRE PRESSURES ARE CRITICAL Capt Jacobs, OO-ALC

TIG BRIEF # 14, Vol XXX, 21 Jul 78

Any good maintenance person or pilot knows that correct aircraft tire pressures are critical to the safety of flight. What some may not realize is that under or overinflation cannot always be determined by "eveballs only." A calibrated tire gauge is necessary to determine if the tire is properly inflated. For example, an F-4 main tire inflated to the proper 265 pounds per square inch (PSI) does not look much different on a fully loaded and stationary F-4 than a tire underinflated to only 205 PSI. There is only threetenths of an inch difference in the deflection of the two tires, deflection being defined as the distance from the top of the wheel flange to the point where the tire meets the surface of the concrete. Even to the highly trained eye, this .3 inch difference is extremely difficult to detect.

Operating a tire in an underinflated condition often causes the tire to experience excessive

sidewall flexing, which generates heat. This heat greatly increases the possiblity of sidewall failure and a blowout. The friction and heat which are built up in the shoulder area weaken the tire and may also lead to a tread separation. Either of these conditions could cause the loss of an aircraft and crew. Even if the tire can withstand this underinflation abuse without failure, damage has been done which will require early tire replacement.

At the other end of the spectrum are the problems caused by overinflation, which is also difficult to detect. Overinflation increases stress on the wheels that may cause them to crack and break apart. It also makes the tire more susceptible to cuts and faster wear in the center of the tread, necessitating early tire removal.

Quality control of aircraft tire pressures means that calibrated tire gauges must be used. Also, tires must be removed according to appropriate technical orders. The Air Force will then get full value from its \$11 million annual investment in aircraft tires.



TAC ATTACK





FUEL GAUGE

Now would you feel when you suddenly awoke in your single-piloted jet, not knowing how long you'd been asleep or unconscious, and found that all you could see was water -- and such an expanse of water wasn't on your flight planned route? Such was the recent case of a Navy pilot on the third leg of a stopover cross-country flight to an east coast air station.

When the pilot regained consciousness, he was heading east at 17,000 feet. He immediately turned to a heading of 270 degrees, noting that his TACAN did not have a lock-on. He tried to contact Center on his last assigned frequency but was unsuccessful. At this time, his fuel quantity registered 1,200 pounds. He set his power at 2,200 pounds/hour and began climbing to FL200. Five minutes after regaining consciousness, his TACAN momentarily locked on a VORTAC close to his destination and registered 154 miles.

This cross-country flight had begun quite a few hours earlier on what was to be a very long and harrowing day. The pilot had awakened after only four hours of sleep and had taken a cold capsule. After going back to sleep for another hour, he awoke again, took two antihistamines, went to base operations, and filed a three-leg stopover flight plan for the east coast destination.

He flew an uneventful first leg lasting a little over two hours. After a second leg of two hours and twenty-five minutes flight time, he landed at his second stopover field but developed an ear block on his final approach to that field. Slightly less than two hours after landing, he took off for his final destination. After leveling at 17,000 feet, he removed his oxygen mask and secured the flow of oxygen. Oxygen quantity was 8 liters. The AFCS was on altitude and heading hold and the throttle was set at a fuel flow of 3,500 pounds/hour.



Over a checkpoint, he experienced UHF difficulties, but did establish contact with his squadron base radio. He informed the SDO that he would be landing in 20 minutes and that his aircraft was "up." This was the last thing that the pilot remembered for the next 45 minutes. Approximately 30 minutes after his transmission to the base radio, the base ODO called the squadron duty officer. He informed the SDO that the pilot had overflown his destination, was over the Atlantic Ocean heading east, and was out of radio contact. His postion at this point had been fixed at 100 miles on the 120 radial of the destination field's TACAN.

The SDO immediately alerted the Air National Guard, requesting that interceptors be launched to intercept the errant aircraft. Fifteen minutes later, two F-106s were scrambled for the intercept.

When the pilot established radio contact with Center, he was informed that two F-106s were inbound to him at 40 miles. Joinup was effected

10 minutes later. After determining that the pilot was now alert and fully aware of his situation, they discussed the return to base and the problem of a rapidly diminishing fuel supply.

A decision had been made to vector the aircraft back to its original destination. At FL200, the fuel supply was 1,000 pounds with 100 miles to go; at 500 pounds, the fuel transfer light began flickering on and off with 45 miles remaining. An idle descent was commenced with the fuel gage reading 400 pounds. The pilot set up and successfully executed an approach to the destination runway. After shutdown, the remaining fuel was measured at 390 pounds -- a real squeaker!

Tests were immediately performed on both the pilot and aircraft. It was determined that hypoxia was not a factor, nor was the aircraft's LOX system found to be deficient.

This near-tragedy was caused by a combination of factors, all of which were direct violations of NATOPS and the use of extremely poor judgment. First, the pilot was self-medicating for a cold. The subject of self-medication as opposed to consulting a flight surgeon has been addressed so frequently that the dangers hardly bear repeating. It is an incident such as this one that proves existence of the dangers so frequently voiced. Second, he had only five hours of sleep; third, he was flying with an earblock; and his final mistake was removing his oxygen mask.

It can truly be said that this mishap was an incident which, except for extreme good fortune, would have been accident.

From the WEEKLY SUMMARY, No. 27-28, 2-8 Jul 78, prepared by U.S. Naval Safety Center



IT NEVER FAILS, "Everything goes wrong at the same time." well accepted fact of life, especially when IFR. OR WHEN YOU LEAST EXPECT IT

BY Lt Joseph Kline **35 TEW** George AFB, CA

amiliar quotes? You bet your life. But year after year precious aircrews are lost because they lived, and, unfortunately, died by them. I am speaking of attitudes and the way in which we react as a result of our perception of the way things are. Such attitudes do not necessarily CAUSE accidents, but may contribute significantly to the chain of events leading to the accident situation. It'll-be-OK-for-this-flight-butlet's-write-it-up-when-we-land attitude is one every pilot has had at one time or another. Judgement, or the lack of it, is an outward projection of attitudes and an important part of human behavior.

I am not recommending that we attempt to change human behavior, but to examine these attitudes in the light of our own personal experiences. Consider the following, for example:

"If anything can go wrong, it will." Pretty good attitude for us pilots, right?

"Everything goes wrong at the same time." A

"When writing a report, always leave room to add an explanation as to why the results do not work out." (The Rule of the Way Out.) How often have you considered your "way out" before you found the way in?

"Information necessitating a change in design will be conveyed to the designer after, and only after, the plans are complete." (Known as the Now-They-Tell-Us Law.) You say you did your last aircrew briefing and flight plan in a record 13 minutes! And even had three cups of coffee. Sure you didn't forget something?

"Any piece of equipment with any malfunction short of complete breakdown will function perfectly in the presence of any trained serviceman." And even repairmen. (Commonly called the It-Worked-Till-We-Got-Off-The Ground-Rule.) Maybe a little more thought about those Emergency Procedures would be in order.

There are also several rules of experimental procedure (the way they fixed your INS) which deserve mention. I take no responsiblity for the originality of these concepts, and any similarity to persons fictional or real, is purely intentional.



OCTOBER 1978



Von Nagle's Constant, also known as the "Finagle" Constant, is best described as changing the universe to fit the equation. Discovered while Professor Von Nagle was attempting to prove "... if a string has one end, it must have at. least one more." This concept enabled scientists to predict the existence of the planet Uranus. Since Newtonian Laws did not agree with the observed universe, the planet was introduced to make the universe fit the equations. Many years passed before the existence of Uranus was proved by observation. Navigators will often use Von Nagle's Constant in their calculations, along with the planet Uranus, since when viewing from that planet, their MPP (most probable position) becomes easier to identify.

The Bougeurre Factor, more commonly referred to as the "Bugger" Factor, was discovered by Dr. Bougeurre and is typified by Einstein's work in adjusting Newton's equations of motion and gravity to fit the observed facts of the orbit of the planet Mercury (later known as the Theory of Relativity). This factor is characterized by changing the equations to fit the universe. "It's got to be colder than the weather briefer said," mumbles the Thud pilot, "so I'll just knock off a couple degrees from this takeoff data, and we won't have any trouble clearing that departureend barrier. Besides, it doesn't look like rain to me."

TAC ATTACK

The Diddle Coefficient shows us how to change things so that the universe and equations appear to fit without really requiring change to either. Haye D. Diddle outlined a more detailed examination of this phenomenon in his somewhat obscure doctoral thesis, "On the Significance of Random Experimental Data." By sufficiently blurring the results, like the photographers use of a "soft" lens in taking pictures of people over 35, they are made to fit the facts in a more satisfactory manner. Like the way you flew that last 1 hour night sortie in 53 minutes. Didn't want to miss "Hogan's Heroes"? Or the time you set your watch back 8 minutes to land 3 minutes before Emergency Fuel.

All of these maxims suggest attitudes toward a reality that is somehow changed to make life easier. Don't kid yourself. Take a good look at how you look at things -- before you call for taxi instructions.

And remember, in case of doubt, make it sound convincing. Just like your last check ride.



VEAPONS WORDS

> weapons. Any problems or deficiencies we find in our equipment may exist Air Force-wide, and it is highly probable that the equipment is being used with real weapons. As a result, design deficiency, malfunction, or failure of any certified equipment listed in TO 11N-20-1001 must be reported as a combination Dull Sword/Materiel Deficiency Report (MDR). This reporting requirement applies to all units regardless of their requirement to participate in a nuclear safety program.

> Additionally, some of us in TAC train with simulated nuclear weapons/certified equipment to be ready to deploy and support contingency plans. We must insure that equipment deployed to support these nuclear contingencies is properly certified. We are involved in the nuclear safety equipment certification program because of reporting and mobility requirements.

> How do we show this involvement in our weapons safety program? For organizations that do not participate in a nuclear safety program, the only requirement is to insure that MDRs on nuclear certified equipment are submitted as combination Dull Sword reports. For type A, B, C. and E units, as defined in AFR 122-8. TACSUP 1, the organization which owns the equipment when deployed is responsible for insuring that only certified equipment is used on nuclear weapons. However, the Weapons Safety Officer (Nuclear Safety Officer) also insures the use of certified equipment with nuclear weapons. Weapons safety personnel can fulfill this requirement by checking: (a) the Custodian Authorization/Custody Receipt Listing (CA/CRL) for equipment which may be used with nuclear weapon systems during the deployment against the tech order, or (2) the mobility equipment list/WRSK list that the mobility plans office maintains against the tech order.

> Any uncertified equipment should be reported to the unit commander. This check may be accomplished as frequently as deemed necessary but at least once annually. If you have alternative methods for conducting this check, please let us know about it so we can share it with others in the field.

LITTLE MISTAKES CAN MAKE BIG BANGS !

By Capt Fred Higaki HQ TAC/SEW

NEWS RELEASE: "On 15 September 1978, a munitions trailer, carrying two B-57 nuclear weapons, broke loose from its tow vehicle and rolled over into a drainage ditch. The two weapons on the trailer sustained major damage. An Air Force officer has been appointed to investigate the mishap."

The news release is fictitious. However, if the mishap had actually occurred, an investigating officer would have been appointed to determine what happened. He would most certainly check to see if certified equipment and procedures were used during the operation. The Air Force Nuclear Safety Certification Program (AFR 122-3) requires the use of only certified equipment and procedures with nuclear weapons. The program further requires us to insure all certified equipment is maintained so nuclear safety is not degraded. So, why are we in TAC involved in the nuclear equipment certification program when only some of us train with simulated weapons, while others have no requirement to train for nuclear contingencies at all? There are two basic reasons: deficiency reporting and mobility plans.

Several items of equipment we use with conventional munitions or even non-munitions items have been certified for use with nuclear

FIXING THOSE WAR SOUVENIRS

SSgt Monte V. Swett 56 EMS/56 TFW MacDill AFB, FL Next time you have a desire to pick up a piece of ordnance (old bomb, bullet, etc.) and take it to the local friendly EOD shop to be "fixed" as a souvenir, don't be surprised if you are requested to sign a form similar to this one. It is just the EOD folks way of telling you it is against Air Force Regs and, above all, not a very smart thing to do.

. (TO BE COMPLETED BY REQUES	TOR)
I,	(RANK) (SSAN) fully cognizant that orm an unauthorized procedure on property of the United accept full responsibility (to include any pecuniary ISAF DOD personnel to undue hazards in following what b fulfill a juvenile need to possess a piece of scrap
(TO BE COMPLETED BY SURVIVI	(SIGNATURE)
A. NUMBER OF FATALITIES OR INJU B. NAMES OF DECEASED AND INJUR C. SENTIMENTAL VALUE OF SC	RED
APPENDAGES	LIFE, EYE, FINGER, OR OTHER
APPENDAGES DATE OF LAST PSYCHIATRIC EVALU DATE OF NAMEPLATE CEREMONY	AT EOD MEMORIAL

CONVERTING A TACTICAL FIGHTER WING OR FLYING IN EVER-DIMINISHING CONCENTRIC CIRCLES

By Lt Col Joseph Rodero 9 TFS, 49 TFW Holloman AFB, NM

n case anyone has been playing Rip Van Winkle for the past few years or happened to overlook the obvious, the tactical air forces are in a period of conversion. The introduction of F-15, F-16, and A-10 aircraft into the operational inventory poses a significant challenge to all concerned. The challenge is different for each unit involved in the turmoil of a conversion, but certain common denominators apply across-theboard. Since there is no handy-dandy manual that provides a step-by-step checklist for conversion managers (what? more later!), this article is designed to provide a look at the experience of one wing in the hopes that other wings will benefit from the discussion and will not have to re-invent the wheel.

OCTOBER 1978

CONVERSION MANAGER

The description of a particular job as "interesting" really applies here. The individual selected to fill this position becomes, in effect, a wing commander without a wing. His ultimate goal is to self-destruct as the wing becomes a reality. He becomes an expert in facilities, manning, maintenance, operations, logistics, and diplomacy while learning a new vocabulary composed of acronyms. Ideally, he becomes a special assistant to the wing or tactical training commander and keeps him current on all aspects of the conversion. While dealing with all functional areas on a base, the conversion manager must establish and maintain open communications channels with AFSC, AFLC, ATC, TAC, AFMPC, and the appropriate numbered air force. The overall involvement is analogous to the charge/discharge of a capacitor (Fig 1).

READY TEAM CONCEPT

We've known for years that TAC is a "ready team"; but under this concept, the term takes on an added dimension. In a nutshell, a unit maintains a predetermined level of readiness on the equipment possessed while converting to a new weapon system. This complicates matters since facilities must be shared; manning increased to accommodate folks in training; common equipment must be joint-used; accounts must be transferred; and those individuals ineligible for conversion must be identified, notified, and PCSd (as the old system phases out).

SATAF

In order to provide all players with a common baseline, Site Activation Task Force (SATAF) meetings are held at the converting base at the start of the activation and at requisitioning, training, and aircraft delivery phase points. Chaired by the appropriate Super SPO, the meetings bring together all MAJCOMs involved



CONVERTING A TACTICAL FIGHTER WING OR FLYING IN EVER-DIMINISHING CONCENTRIC CIRCLES

in the conversion. Emphasis is placed on identifying deficient areas and assigning action items with responsive suspense dates.

CONVERSION MANAGEMENT INTERFACES

At least 18 months before the first squadron is required to come on line, the wing commander should select a qualified field grade officer (with retainability) to become the conversion manager. As you (the newly appointed conversion manager) hang up your goat skin and store your secret mil settings in a safe place, you should begin agitating for dedicated points of contact, select an NCO, and find yourself a convenient office with adequate communications (rotary, autovon, TAC switch, and intercom). When you get your marching orders from the boss, request access to his daily read file and begin collecting conversion-related traffic. Update the staff once a month through briefings at the Commander's Weekly Review. Increase the frequency to twice a month at 6 months from the first squadron activation, and to weekly at 3 months from activation. By the time the first SATAF minutes hit the street, the need for a dedicated body in DO, MA, DP, DE, and RM will become obvious.

Your key players are in the MA and RM areas. Pick the MA representative early. Request everyone but the one you really want since the MA will be reluctant to release his best captain. When you've got him wondering why you didn't request Captain X, and he's giving you reasons why he can't release Y or Z, gracefully concede the fact that you'll settle for X (whom you really wanted all along). Keep this troop close to you. Get him (and you) involved in equipment flow, facility status, training, etc. When you need an answer as to the impact of not having a doublehandled ratchet twister or whether or not maintenance can support a deployment to East Oshkosh 2 weeks after activation, your maintenance guy is the key.

You'll need horsepower in the RM side. How aggressively the LGS handles nondeliveries, lost equipment, loads, delays, and surprises (yes, Virginia, there are surprises) will set the tone for your conversion. A funny thing you learn in this job is that the end items are easy (aircraft and engines, for example); while support equipment, spares, and tools lag ... and lag ... and lag.

Engineering support provides the adrenalin to liven up otherwise dull days. If you don't get a single point of contact who can answer all conversion-related questions on new construction, renovation, work orders, and category codes, you're behind the power curve. Get support from above and insist on proper supervision, constant QC checks, and last minute checks prior to turning anything on. Faces turn red, with embarrassment and anger, when your spanking new avionics shop power supply melts from improper phasing of three-phase lines (no. it didn't happen to us). Watch out for pitfalls. Murphy's Law holds for sure, particularly in those nebulous areas where different contractors interface.

The DO interface is fairly simple. The MAJCOM establishes the criteria for conversion and normally includes remote eligibility, time on station, and retainability with judgment calls at the wing level on capability. Your problem starts when you are sipping a TACBURGER at a party or trying to get on the flying schedule and someone asks, "why him and not me?" It continues downstream when everyone is in concrete with class dates and someone scheduled to go TDY next week to learn to fly a shiny new machine decides to separate. The FAIP and UPT inputs are beyond your control.

SUMMARY

Throughout a conversion, a lot of people will think you're getting in their knickers. GOOD!! If you don't, you're not doing your job. As results become evident, back off and get out of their hair. Make sure everyone knows you're still available to serve as a go-between to resolve problems. Pretty soon, you'll find all the strings you've been pulling have a life of their own and you have run out of a job. Find your flight suit and check six!



TAC SAFETY AWARDS

Individual Safety Award

Airman First Class Samuel M. Cannon, 27th Component Repair Squadron, 27th Tactical Fighter Wing, Cannon Air Force Base, New Mexico, has been selected to receive the Tactical Air Command Individual Safety Award for October. Airman Cannon will receive a desk set and a letter of appreciation from the Vice Commander, Tactical Air Command.



A1C Samuel M. Cannon

Crew Chief Safety Award

Airman First Class Mervin L. Rohrer, Jr., 431st Aircraft Maintenance Unit, 35th Tactical Fighter Wing, George Air Force Base, California, has been selected to receive the Tactical Air Command Crew Chief Safety Award for October. Airman Rohrer will receive a desk set and a letter of appreciation from the Vice Commander, Tactical Air Command.



A1C Mervin L. Rohrer, Jr.

The following is a narrative account of how proper training and a good mental attitude can prepare you for an extremely tight situation-- engine failure during takeoff. Capt Chase successfully ejected from his A-7D at 150 feet and 150 KIAS without injury.

Here's his tale :

the boy scout motto

By Capt Mike Chase 354 TFW/DOW Myrtle Beach AFB, SC

On 31 Jan 78, I was scheduled to lead three fighters to the local bombing range and then work with a FAC in a nearby Military Operating Area (MOA). Everything was standard until I raised the gear.

During the takeoff roll, all the engine instruments were normal. My wingman made a decent formation takeoff, and after I checked his aircraft and gave him the gear-up head nod, I raised the gear handle. Immediately I heard a loud bang, followed by continuous bangs, sounding much

like shooting the gun with the canopy open. I knew I had compressor stalls, so I retarded the throttle slightly in an attempt to clear them. When they didn't clear, I returned the throttle to MIL power and glanced inside the cockpit to extend the RAT. About this time, I saw #2 leave me on the left side. I began holding back on the trim button with my right hand and retarding the throttle with my left. I then started to get the sensation that the airplane was about to quit flying. Glancing back in the cockpit and seeing the airspeed decreasing through 150 KIAS, I transmitted, "I have compressor stalls; I'm getting out." I assumed a good ejection position and pulled the lower handle with both hands. I remember the canopy leaving the aircraft and



the blast of wind. As the airplane fell away from me, I could see down into the cockpit for a split second.

My first thoughts were to get out of the seat, so I pushed out with my feet and leaned forward. I could see the end of the runway and overrun below me. I lost sight of the airplane as I started a somersault. I went for the parachute D-ring with both hands; but just as I touched it, I saw the chute deploy and blossom. At the same time #3 (who had taken 10-second spacing) passed me on the left.

As I swung down under the chute, I turned so I was facing the burning airplane. An 800-foot trail of flames pointed like an arrow to the aircraft which was completely engulfed in fire. I thought, "I have to do the four-line mod to steer away from the fire." I looked up but couldn't locate the steering lines because the top of my helmet was in the way. So I decided to remove my mask to see if the lines would be visible. As I clicked off the right side of my mask, I felt the seat kit deploy and saw the raft start to inflate. Then I noticed that I would land clear of the fire and did not have much time to steer. I was coming down pretty slow and initially thought about making a standup landing; however, good judgement prevailed and I performed a parachute landing fall (PLF). I released the chute and started to walk away when I realized that the seat kit was still attached, which I punched off. Only then did I realize what had happened, and that I was okay. I yelled, "All right," at the top of my lungs and started to walk across the runway.

I stopped at the seat lying on the runway and picked up the lower ejection handle. My first words to anyone were to one of the dearm crew who came running over. "That SOB worked, didn't it?" I said, pointing to the seat. He said, "What?" I replied, "The seat and the chute, they worked, didn't they?" As you may guess, I was impressed.

THE BOY SCOUT MOTTO

With time for reflection, I have arrived at some things that I attribute to my successful ejection, aside from outstanding maintenance on the ejection seat and parachute.

Because I heard Capt Brian Shul recount his egress from a flaming T-28, and because I read a short TAC ATTACK article about Capt Wood's takeoff emergency in an F-5, I mentally go through emergency ground egress procedures every time I start the engine. Before takeoff, I go through the motion of getting in the proper ejection position and touching the ejection handle. Another valuable aid is the A-7 simulator. Having developed good habits in the simulator and knowing that 150 KIAS is the bare minimum, my decision to eject was automatic. I feel that by watching outside the airplane and having thought out the procedure many times before, I saved time and probably averted making a mistake.

If I had it to do over, I would do these things differently: First, I wouldn't have spent so much time trying to fix the airplane. Secondly, I wouldn't have transmitted over the radio; it cost me time. Thirdly, after landing I would have taken the survival radio and told my flight that I was okay. I had assumed the tower would report my condition to the flight.

Well, all has been said and done. Know the egress procedures for your aircraft and what you would do if you faced a takeoff emergency. If your turn comes, enjoy the ride.

TAC	Ser Ser	No.				A A A A A A A A A A A A A A A A A A A			*
	TAC			F	ANC	5	AFR		
		thru AUG		AUG	thru AUG			thru AUG	
	AUG	1978	1977	AUG	1978	1977	AUG	1978	1977
							Sol-		1 miles
CLASS A MISHAPS	5	23	18	0	10	8	0	2	1
AIRCREW FATALITIES	4	17	8	0	7	3	0	0	0
TOTAL EJECTIONS	2	23	16	0	5	8	0	2	1
SUCCESSFUL EJECTIONS 🔶	1	18	13	0	4	5	0	2	1
								The second second	

TAC Flight Safety Trophy Winners

363 TRW Shaw AFB, SC 17 May 1977 - 16 May 1978

507 TAIRCW Shaw AFB, SC 15 June 1977 - 14 June 1978

58 TTW Luke AFB, AZ 15 July 1977 - 14 July 1978 354 TFW Myrtle Beach AFB, SC 15 June 1977 - 14 June 1978

1 SOW Eglin AF Aux Fld #9, FL 1 July 1977 - 30 June 1978

919 SOG (AFRES) Eglin AF Aux Fld #9, FL 30 July 1977 - 29 July 1978

CLASS A MISHAP COMPARISON RATE 77/78 (BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

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AFK	78	0.0	0.0	10.9	7.8	6.0	4.8	8.1	7.1			
ACD	77	0.0	0.0	10.1	7.4	5.6	4.7	4.0	3.5			
ANU	78	0.0	3.4	4.0	5.9	8.1	7.4	7.9	6.9			
ANC	77	0.0	3.1	1.9	5.7	4.4	5.4	5.4	5.4			
TAU	78	16.0	12.4	8.3	7.5	5.8	6.3	6.1	6.8			
TAC	77	0.0	5.3	5.8	5.4	5.1	5.0	5.6	5.1		1	



Seal And

a standing