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TAC ATTACK

TAC Attack

April 1977

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APRIL 1977



SCAR....Pg 4



FOR EFFICIENT TACTICAL AIR POWER



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TACRP 127-1

Articles, accident briefs, and associated material in this magazine are non-directive in nature. All suggestions and recommendations are intended to remain within the scope of existing directives. Information used to brief accidents and incidents does not identify the persons, places, or units involved and may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. Names, dates, and places used in conjunction with accident stories are fictitious. Air Force units are encouraged to republish the material contained herein; however, contents are not for public release. Written permission must be obtained from HQ TAC before material may be republished by other than Department of Defense organizations.

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Angle of ATTACK

AFMV ACCIDENT PREVENTION

If you were an E-3 under 21 years of age driving an Air Force pick-up truck on Nellis Air Force Base on a Wednesday during November 1976, your probability of having an Air Force motor vehicle accident was the highest in the command. Chances were greater than equal that you collided with another vehicle and that you were at fault. The record also shows that you failed to yield the right-of-way and were exceeding the speed limit when the accident occurred.

The book on TAC 1976 Air Force motor vehicle (AFMV) accidents has been written, and the previous paragraph revealed the plot. Our AFMV accident rate for the command has remained approximately the same for the past three years - 2.4. This statistic should not make anyone happy, and I assure that it does not give me any solace. I am not satisfied with the same rate year after year. I am not satisfied with mediocrity. We must drive the AFMV accident rate down - that's progress.

Commanders and supervisors must examine their driver training programs to insure defensive driving attitudes and techniques are hammered home. We must make our examining procedures tough. Close supervision of our younger less experienced drivers is absolutely essential. A thorough selection process is the key. Should performance become substandard, we must not hesitate to take remedial action.

Our vehicle fleet is old, and the numbers are limited. The conservation of this limited resource will allow more of the taxpayers' money to be spent on planes and bullets. This not only increases our readiness, but also gives the people of this country more for their money and justifies the trust which they have placed in us - the keepers of national security.

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

SCAR

The NEW FACE of TACTICAL Reconnaissance

By Capt Stephen R. Elm
67 TRW
Bergstrom AFB TX

"Safety is the conservation of combat capability." How many times have you heard it? And how many times have you thought it was just the latest in that long series of slogans meant to take the fun out of flying and further restrict realistic training? Looking at this slogan from the standpoint of innovative tactics and training may give a new tune to the old song. Conservation of combat capability not only applies to conducting daily peacetime training safely but also developing tactics which make the most efficient use of our resources in combat operations. Strike Control and Reconnaissance (SCAR) is a concept which seeks to more effectively use our limited number of attack aircraft.

Officially, SCAR is defined as acquiring and reporting air interdiction targets and controlling air strikes against such targets. Flown in a variety of aircraft under a variety of names, SCAR techniques have been employed in every US air war. This persistence can be attributed to the continuing challenge SCAR seeks to meet: locating and destroying mobile targets in high threat environments without incurring unacceptable losses. The task has always been difficult because targets are constantly on the move, and information concerning them must be timely to achieve destruction prior to their engagement with friendly forces. In future conflicts, the timely detection, identification, and location of mobile targets will continue to be a problem.



until advanced technology provides decision makers with continuous, all-weather, real-time surveillance of the entire theater of operations.

Unfortunately, corporate memory is short, and there has been little carry-over of knowledge gained from one conflict to the next. Each new conflict brings with it almost a zero-based learning curve, and the "wheel" often must be reinvented. Inventing wheels while the bad guys are shooting real bullets becomes a costly proposition in terms of men and aircraft. While combat tactics must be dynamic to stay ahead of changing situations, wartime is not the best time to be doing experimentation in basic tactics.

In January 1976, HQ TAC directed a tactics development and evaluation (TD&E) to de-

termine the value of SCAR as an option for the tactical forces commander. By May, the 49 TFW (Holloman AFB) and the 67 TRW (Bergstrom AFB) with the aid of the 414 FWS (Nellis AFB) had developed tactics and procedures for the employment of RF-4C aircraft and aircrews in the SCAR role. Why the RF-4? Two reasons: Established reconnaissance aircrew training is particularly well suited for crossover to the SCAR role; and the number of attack aircraft may be so limited in the next conflict that all assets capable of dropping bombs will have to be used in that role. Both the employment concept and specific tactics continue to be tested and modified in RED FLAG and BLUE FLAG exercises.

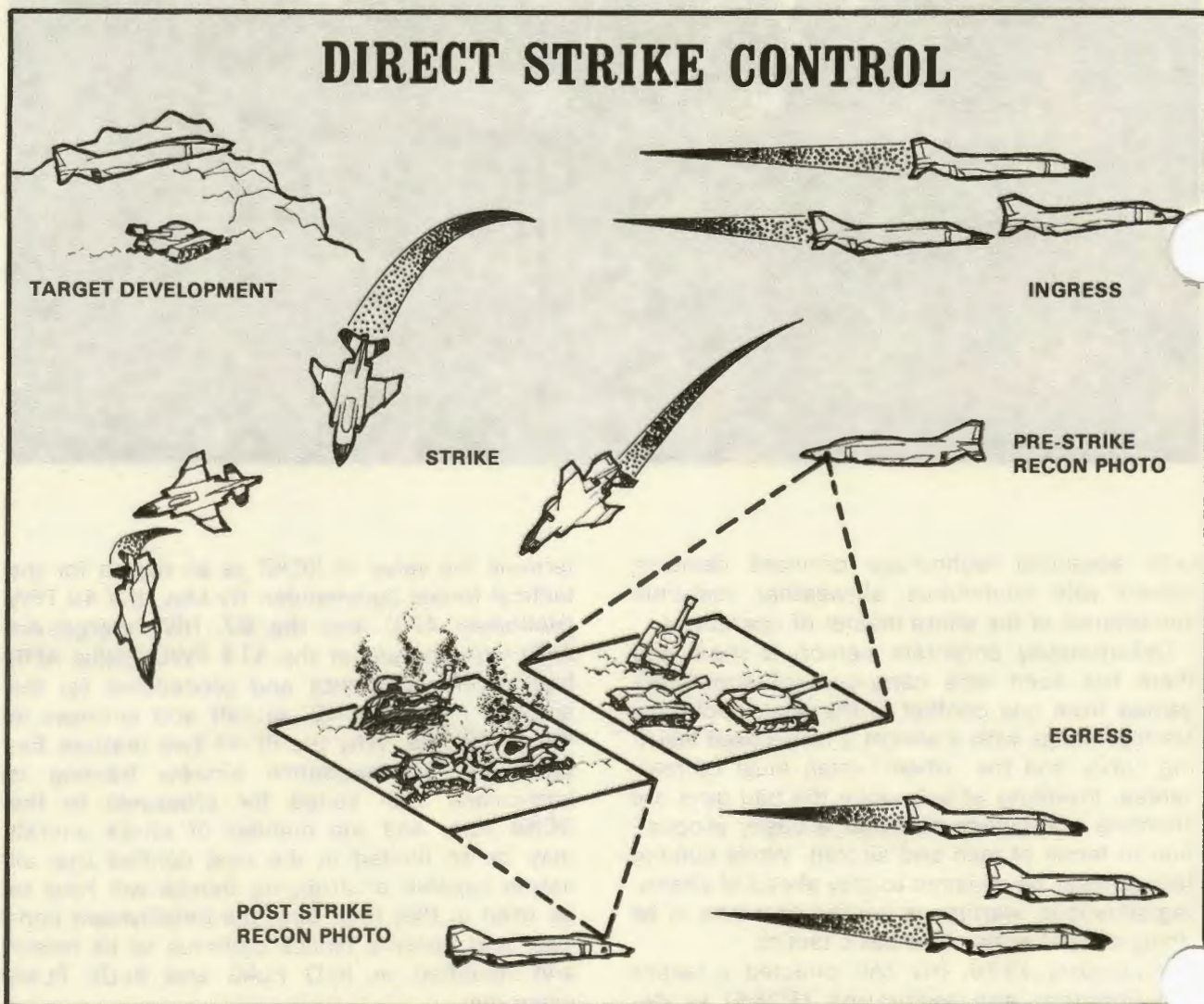
SCAR

The best way to explain SCAR is to describe a typical profile as it is flown today. SCAR has been flown at medium and low altitudes. However, the very low altitude missions are the most demanding and best illustrate the principles involved. The SCAR mission has six main elements: (1) Target Development, (2) Rendezvous, (3) Ingress, (4) Strike Control, (5) Damage Assessment, and (6) Egress.

Target Development

Each SCAR aircrew becomes totally familiar

with their assigned area of responsibility through concentrated study of all available intelligence data. Just prior to launch, they receive the latest update on enemy activity within their area and the most current list of target priorities as established by the tactical forces commander. The SCAR crew then launches before the fighters in order to visually reconnoiter the area, pinpoint positions, and confirm direction of movement for the targets. Based on the priority list, they next determine which of these targets are most lucrative and validate those to be attacked first. Exercising this on-the-scene selectivity prior to committing fighters ensures that attack aircraft are not exposed to the threat needlessly and that only the most lucrative targets are struck.



ing terrain masking at very low altitude and high airspeed, the SCAR crew exits the target area and reports the targets they discovered while proceeding to a preplanned rendezvous point.

Rendezvous

Attack assets can be allocated to the SCAR aircrew in one of three ways. Aircraft on 5-minute alert can be launched after the SCAR crew has reported targets. Aircraft already airborne can be diverted from targets of lesser priority; or, the attack flight can preplan a rendezvous with the SCAR aircraft at a predetermined point and a specified time. In the last case, the fighters are assigned backup targets. If the rendezvous is not successful, then the fighters can still execute an effective mission. The rendezvous point is a reference point relatively safe from the enemy threat and easily found by both the SCAR and fighter aircrews. It may be located on either side of the forward edge of the battle area (FEBA) where terrain can provide shielding from enemy radar and communications jamming. During rendezvous, the SCAR crew gives the strike briefing to the fighters. Properly executed, the rendezvous and briefing take less than one minute.

Ingress

After the rendezvous, the fighters take spacing behind the SCAR aircraft. En route to the target, the formation flies at very low altitude to minimize the chance of detection by enemy radar. The SCAR and fighter crews provide each other mutual support. Because they are thoroughly familiar with the area, the SCAR crew can better avoid defenses, take the navigational load off the fighter flight lead, and provide additional ECM and chaff support. The fighters, freed of the prime responsibility of navigation, can devote more time to visual lookout, protecting themselves as well as the SCAR aircraft by providing an offensive capability against threats.

Strike Control

The actual attack portion of the mission begins at a point called the Attack Reference Point (ARP) which is located along the ingress route at a predetermined distance from the target. The SCAR crew marks the ARP, normally firing two photoflash cartridges that give a flash of light and then leave a small dense cloud

of grey-white smoke in the air. As the fighter crews initiate their timing to begin the pop-up maneuver, the SCAR crew continues to the target and marks it with photoflash cartridges or 2.75-inch white phosphorus rockets. The combination of marking both the ARP and the target reduces exposure to the enemy threats. The ARP lets the attack aircrews know exactly the distance and direction to the target, making the pop-up a very precise maneuver. This precludes popping early with the corresponding "float" to the target or popping late which may require a re-attack. If the target is difficult to see, marking it solves the target acquisition problem, further reducing exposure time. These tactics minimize the most vulnerable time for the fighters ... when they face the full range of enemy threats, when they've lost much of their airspeed in the climb, when they're heavily loaded with bombs, and when they are concentrating on hitting the target. Responsibilities are divided so that mutual support never breaks down. As the SCAR crew is marking the target, the fighters provide lookout and threat warning. As the fighters are delivering ordnance, the SCAR crew provides similar cover for the fighters, while simultaneously maneuvering to conduct damage assessment.

Damage Assessment

The damage assessment can be accomplished visually and relayed immediately, or accomplished photographically with a side-looking camera from a stand-off position. Obtaining damage assessment from a stand-off position beyond the range of point defenses in the immediate target area allows the SCAR crew to look under the smoke and debris to determine if the target was destroyed. After the fighters have delivered their ordnance, they rejoin with the SCAR aircraft to exit the area.

Egress

Since the SCAR crew has the fighters in sight during ordnance delivery, the SCAR pilot maneuvers as necessary to facilitate rejoin into a mutual support formation. Once out of the target area, the formation either proceeds to another target or egresses to friendly territory. The same mutual support techniques that were used coming in to the target area are used going out.

SCAR

The procedures just described are called direct strike control. There is another type of strike control ... indirect. Indirect strike control, exercised by the SCAR aircrew while they are not physically located in the target area, can be used only when certain conditions are met. Since the target will not be marked, it must be one that can be readily identified by the attack aircrew. An enemy staging area, for example, is a more suitable target for indirect strike control than is a camouflaged radar van. Another prerequisite is a common reference point, such as a delta point or geographic feature, known by both the SCAR and the fighter crews. With a reference point and an identifiable target, the SCAR crew can give the fighters a bearing and distance from the reference point to the target or provide offsets for the fighter's Weapons Release Computer Set (WRCS). The fighters can attack the target while the SCAR crew simultaneously conducts other strikes or returns to base. If indirect strike control can be used, the survivability and efficiency of the SCAR crew are enhanced because they can control simultaneous strikes against different targets without having to reenter the high threat area. Yet, because visual reconnaissance was conducted, the advantages of target validation and selectivity prior to committing attack aircraft are still retained with indirect strike control.

The requirement for timely intelligence and responsive strike was mentioned earlier. It is always important but would become critical if our next conflict finds us in a position of numerical inferiority. If numerically inferior, we cannot engage in one-for-one attrition; we must achieve maximum disruption and destruction with our limited resources. Soviet tactical doctrine bases the successful offensive operation on combat momentum - obtaining a "shock effect" with large numbers of men, mobile equipment, and massed firepower on the move. If combat momentum is destroyed, the Soviet offensive can be defeated. Timing is critical in maintaining momentum because proper elements must come together within a specified time frame to be effective. The key to decisive disruption is to destroy those key elements that are critical to the offensive. If we can exercise decisive disruption,

a multiplier effect becomes apparent with the more effective application of smaller numbers of attack aircraft. To respond within particular time frame, our forces must have the capability to react quickly to the latest intelligence data. SCAR provides that capability by matching near real-time information with near real-time attack.

Training is the key to both wartime preparation and the safe conduct of SCAR in peacetime. The SCAR role, because it is a new mission, places new demands on aircrews and breaks traditional habit patterns. In addition, all the old hazards are still present and often accentuated. Most of the hazards are related to two aspects of the SCAR mission: (1) flying at very low altitude at "warp 8" and (2) doing pop-ups. Flying at 100' AGL, a 2-degree decrease in pitch will plant the aircraft into the ground in 3-1/2 seconds. Crews cannot divert their attention for even short periods of time. Consequently, the pilot must always have his head out of the cockpit, concentrating on aircraft control and terrain clearance. The most common remark by crews after completing their first SCAR mission is, "Things sure happen fast." Things do happen fast, particularly for the fighter guys. There you are blazing around the hills at the speed of light, worried about maintaining your formation, protecting the SCAR aircraft, setting switches, clearing for threats, and wondering if the "recce puke" in front of you ducking in and out of the valleys really knows where he's going. Suddenly, out in front, you see two flashes and puffs of smoke. "Ah, so that's what those photo-whatcha-macall-its look like. Oops - time to pop already." Pop-ups have been discussed in other articles at length and ample guidance has been provided. However, there are subtle factors which exert more pressure on crews doing pop-ups in the SCAR role. Standard habit patterns may break down on a strange range with no familiar landmarks to cue your actions. Procedurally and tactically, this mission is slightly different from any other. In addition, aircrews may have a tendency to press more. SCAR crews don't want to embarrass themselves by not getting their smoke on the target. Conversely, the fighter crews want to look good since the SCAR crew is watching.

Although the problems associated with SCAR may be unique, the solutions are not. Once supervisors and crews ensure that no aircrew is committed beyond his capabilities, thorough



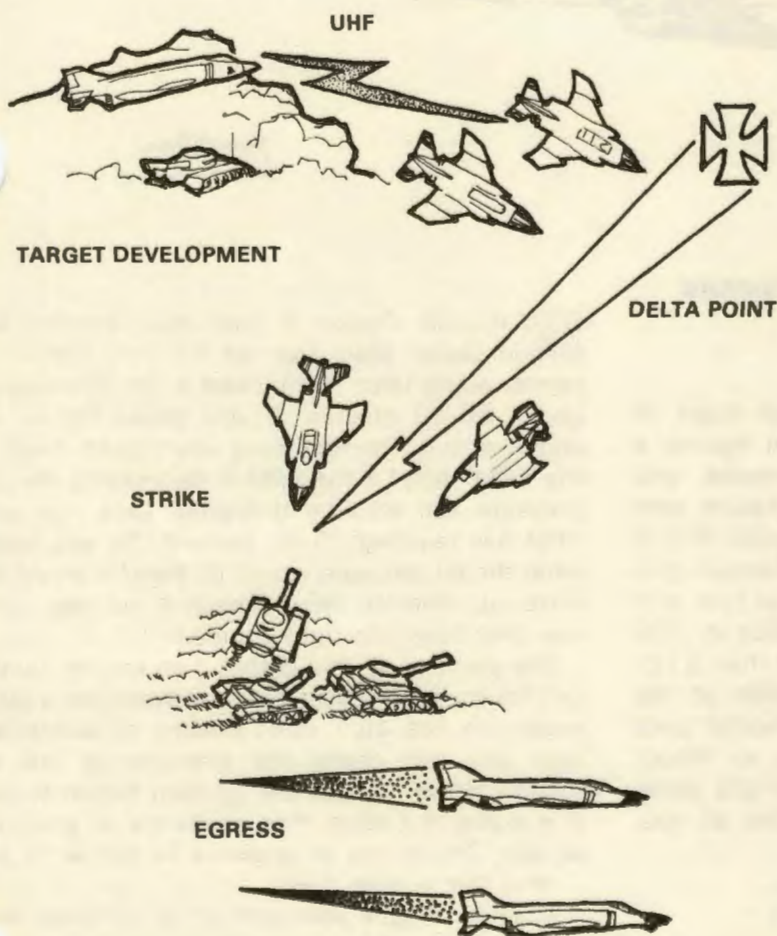
CAPT STEPHEN R. ELM is this month's Fleagle T-shirt winner.

preparation, good crew coordination, and sound judgment will take care of the rest. Each member of the formation must understand how the mission is to be accomplished and what his responsibilities are. Then, everyone must be provided the opportunity to practice. As aircrew experience levels decrease in our squadrons, SCAR offers a safe alternative to the dangers of crews becoming semiproficient jacks-of-all-trades, but masters of none. Based on the premise, we do best, and safest, what we do most often, SCAR crews train on navigation and target acquisition while fighter crews concentrate on mutual support and ordnance delivery. Both become proficient masters, and the entire mission becomes significantly safer.

Today, SCAR is increasing our operational readiness at nominal cost. It has the flexibility to be adapted to any number of scenarios. It has the responsiveness to meet the challenge of destroying mobile targets; and it enables the Tactical Forces Commander to operate more effectively in an intense communications jamming environment or under adverse weather. The subtle significance of the SCAR concept lies in the fact that it is a capability gained, not with exotic equipment or expensive modifications, but solely through training ... training that complements, rather than substitutes, normal fighter and recce training. This new capability improves survivability in combat and enhances flight safety in peacetime.



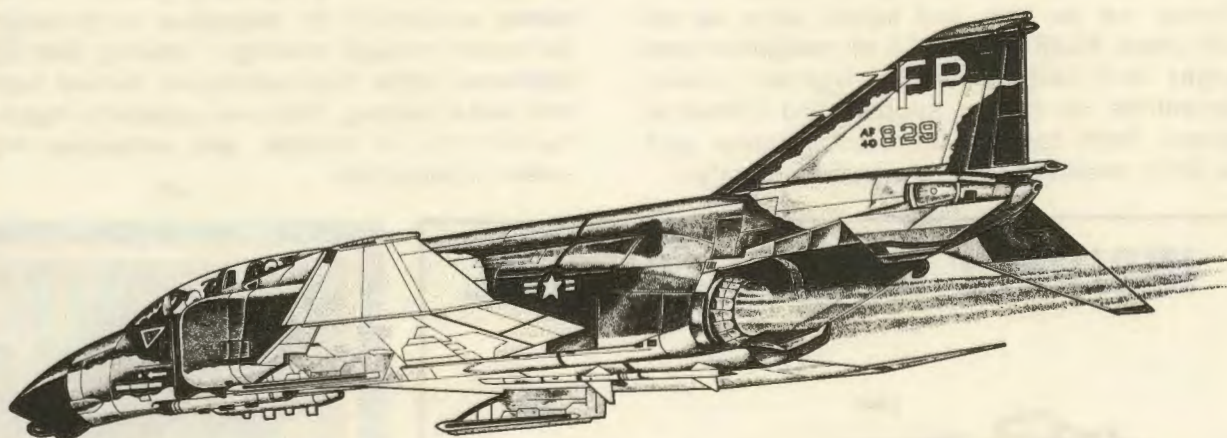
INDIRECT STRIKE CONTROL



Captain Stephen R. Elm (M.S., University of Southern California) is Chief, 67th Tactical Reconnaissance Wing Weapons and Tactics Division. His service experience has included assignments to Headquarters USAF Directorate of Doctrine, Concepts and Objectives; and Chief, 432 TRW Quick Reaction Reconnaissance Program, Udorn RTAFB. He has 2100 hours in the RF-4C which include 650 combat hours.

F-4

Emergency Situation Training



James H. Brown
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By Maj Gyle Atwood & Capt Gary Studdard
18 TFW, Office of Safety
Kadena AFB, Okinawa

You're number two in a two-ship flight of Phantoms flying a dissimilar mission against a pair of F-5s. After a few clever moves, you manage to get into a slow-speed hassle with one of your adversaries, and he's rapidly sliding to your six o'clock. Realizing your chances of a kill are diminishing, you decide a break turn is in order. While smoothly honking in 6.5Gs in .006 seconds, your PK rapidly goes lower than a rattlesnake's navel with the appearance of the Master Caution light. In your best fighter pilot voice, you nonchalantly tell everyone to "Knock It Off," and glance towards the telight panel where the RH GEN OUT light smiles at you. Whatcha gonna do now, ace?

- OPTIONS: A. Ignore it, it'll go away.
B. Check the oil pressure.
C. Reset the generator.
D. Check the RPM.

DISCUSSION: Option A may work for the Six Million Dollar Man, but not for you. Option C comes along later, if you need it. So, now you've got a 50-50 chance. If you chose Option B, you're wrong. The first thing you should check is the RPM. Why? If the RPM is decreasing, the oil pressure will also be dropping. Let's say your RPM has reached 25-30 percent. Do you know what the oil pressure would be then? It would be hovering close to zero. (Check it out next time you shut down the right engine.)

The point of all this is that if an engine flames out for no readily discernible reason (not a stall, explosion, fire, etc.), don't assume oil failure unless you can check the pressure at idle or military power. Check the ignition button to see if it works. If it does, then check the oil pressure at idle. Should the oil pressure be below 12 psi ... shut that engine down.

A single engine approach is no problem. But if you have other problems, it would sure nice to have two motors instead of one. ➔



TAC SAFETY AWARDS

Maintenance Safety Award

Master Sergeant Myles H. Duffield, 27th Organizational Maintenance Squadron, 27th Tactical Fighter Wing, Cannon Air Force Base, New Mexico, has been selected to receive the Tactical Air Command Maintenance Safety Award for this month. Sergeant Duffield will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



MSgt Myles H. Duffield

Crew Chief Safety Award

Sergeant Ernest E. Flowers, 35th Organizational Maintenance Squadron, 35th Tactical Fighter Wing, George Air Force Base, California, has been selected to receive the Tactical Air Command Crew Chief Safety Award for this month. Sergeant Flowers will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



Sgt Ernest E. Flowers

Ground Safety Award of the Quarter

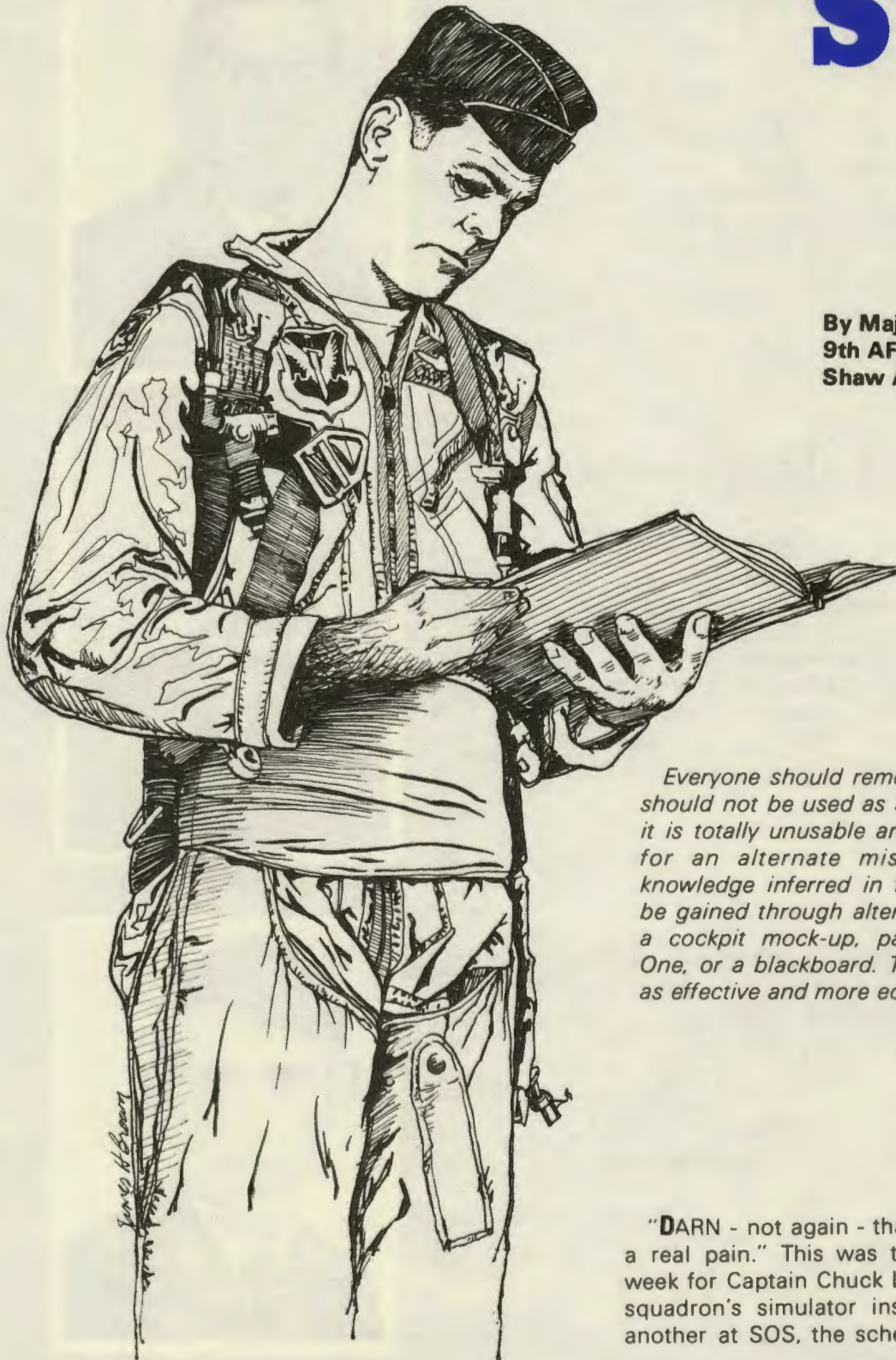
Staff Sergeant Leland F. Gotcher, 366th Field Maintenance Squadron, 366th Tactical Fighter Wing, Mountain Home Air Force Base, Idaho, has been selected to receive the Tactical Air Command Ground Safety Award for the fourth quarter 1976. Sergeant Gotcher will receive a certificate and letter of appreciation from the Vice Commander, Tactical Air Command.



SSgt Leland F. Gotcher

SHAR

**By Maj Mike Frenzel
9th AF/Flight Safety Officer
Shaw AFB, SC**



Everyone should remember that the simulator should not be used as a part-task trainer unless it is totally unusable and cannot be scheduled for an alternate mission. The transfer of knowledge inferred in the following article can be gained through alternative methods such as: a cockpit mock-up, panel photographs, Dash One, or a blackboard. These alternatives can be as effective and more economical. ED

"DARN - not again - that simulator schedule is a real pain." This was the third simulator this week for Captain Chuck Lincoln. With one of the squadron's simulator instructors on leave and another at SOS, the scheduler was really doing

E THE WEALTH

a number on him. "Oh well, no matter about the schedule," he thought on the way out the door, "but I sure wish there was a better way to skin that simulator cat ... the crews even know the profiles by heart." He arrived at the simulator briefing room a few minutes early, picked up a copy of a recent TAC ATTACK, and started flipping through the pages. As a picture of an F-15 unfolded, Chuck seemed to strain to remember something. "What was that I heard about the F-15 simulator program - well for one thing, they don't have one yet; but that wasn't it - what was it ...?" It started coming back slowly.

The crew startled Chuck as they came around the corner. The usual greetings were exchanged, as the briefing guides were readied. Just then Sgt TerryL stuck his head in the door and announced that the RHAW function of the sim was down. Ted and Bob sank back in their chairs ... this was to be their last required sim for the period, and they needed an ECM profile. Chuck leaned forward, started to speak, yet made no sound. The words were still being formulated. Then he blurted it out, "I'd like to go ahead anyway. I'm working on a new F-15 type profile ... and we don't really need the lights ... here's what we'll do." And so he began to unfold the game plan even as it was being remembered, revised and retold.

"You guys get in the box, I'll sit in the jump seat ... and rather than turn on a light or flip a switch from the console, I'll tell you what the indications are, give you time to talk about it, then I'll ask questions. What do the indications mean? What to do about it ... that way we'll get to discuss the systems, the capabilities, and most importantly, the real meaning of what you see."

Ted came back, "But what is really so different about this and turning on a light?"

Bob chimed in, "And what's this got to do with the F-15?"

Chuck smiled, realizing that he had obviously pped over some of the prelims. So he started again, "The F-15 simulator isn't ready yet so the

jocks sit in a procedural trainer similar to those used by the RTUs. The instructor poses a situation and the student responds. The two discuss the system, the procedure, and the procedure's effect on the faulty system and on other related systems. The way we do it now, I turn a warning light on and you turn it off. Unless you make a procedural error, we never really analyze the situation as the Dash-One requires."

Chuck paused, then started again, "Let's try one - you're at 1,000 feet AGL, 420 knots, on the low-level route when the right generator-out light comes on."

Bob immediately came back with a question about the Bus tie, which was closed.

Ted wanted to know about the oil pressure and nozzle ... both normal ... after a slight pause, Ted announced his diagnosis as a simple single generator failure.

Chuck didn't acknowledge the diagnosis: rather he announced that several circuit breakers were popped. Bob wanted to know which ones and Chuck responded after checking the fold-out page in the Dash One and selecting a few likely suspects. Chuck could see the bewilderment on the crews' faces. And it got worse when Chuck announced a check hydraulic pressure light. It didn't take long to confirm a failure of the right utility. The big question ... is this another emergency or a continuation of the same?

Chuck declared a short academic recess, and gave the guys a hint - "This is a continuation of the same emergency; in fact, the real emergency hasn't yet been discussed. The generator problem and the hydraulic failure are only indications. The key is in the Dash-One preamble to the procedure, not in the surface indications you're getting."

Just then Ted's eyes lit up - and he came back with a barrage of questions. "What's the EGT? Are there any fumes? Smoke? Unusual noises? Other lights on the telelight panel?" and a host of others that even the best sim can't duplicate.

share the wealth

Chuck was caught a little by surprise and was "humping" to come back with the proper response for the emergency he had selected. It was a more difficult task than he'd imagined. Bob, too, was humping trying to flip through the checklist looking for the proper procedure. That page with the "light - cause - corrective action" matrix was of no help - it required the crew to "carry out procedures," but in this case, it didn't say what procedures.

The feverish pitch was abruptly brought to a halt when Ted almost shouted, "Duct failure, bleed air duct failure!" followed by a very calm, "and we've got to land, now."

Bob quickly found and read the appropriate procedure and started to list the other procedures that would require attention prior to landing.

Chuck thought to himself, "That was good, that was really good. They went through several full systems before they tied it all together. And I had to do some fast thinking myself to make sure the indications I gave were, in fact, realistic"

Ted, proud of his obviously superior analytical mind, just couldn't keep his mouth shut. He admitted that he had just recently read that particular paragraph in the Dash One when the associated caution caught his eye. He had originally been studying only the cautions, warnings and notes in preparation for his writtens.

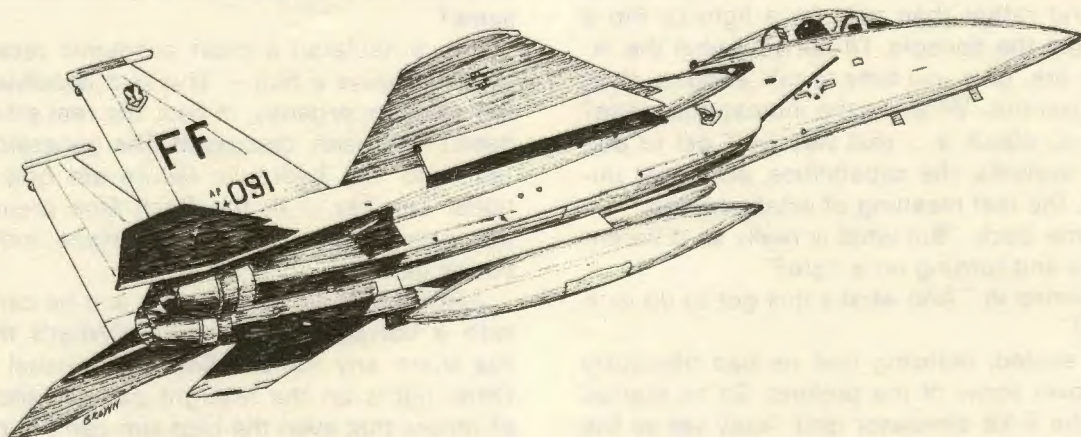
Chuck picked it up from there, "That's the problem ... few guys get into the text of the procedures after the initial exposure. Most just rely on the checklist steps. And obviously, that's not enough."

Chuck paused, then started again, "New situation, ... your ingressing to the target area, medium altitude, dual base environment, flight of two, when you get a flashing activity, steady launch, steady tone and no strobe. What's the threat? Its capabilities? What's your response?" The resulting discussion was, to say the least, informative with each benefiting from the experience of the others.

"Sir ... Sir ..." It was Sgt Terryl interrupting a rather detailed discussion of capabilities and tactics to announce the end of the period.

As the three drew a cup of coffee in the briefing room, there was a real feeling of accomplishment. It had been a long time since each had been taxed to that degree. Simulator mission profiles had assumed a very musty, stale look about them. Filled with the sense of "let's get it over with," without any attempt to use the time for meaningful discussions.

They continued to talk about their new experience even as they entered the crew lounge back at the squadron. Before they realized it, there were several other guys in the thick of it ... a real old-fashioned hangar flying session. They were really analyzing the situation, getting to know how all the systems interfaced, and how their loss affected the crews' capabilities to carry out the mission. Chuck suddenly realized he had started something - and it was good. BUT HOW DO YOU KEEP IT GOING ...?





AIRCREWMEN of DISTINCTION



Capt Robert L. Trevino
310 TFTS/58 TFTW
Luke AFB, AZ



Capt Kenneth R. Ritt
310 TFTS/58 TFTW
Luke AFB, AZ

Captains Trevino and Ritt were flying an IP syllabus ACM training sortie. Shortly after disengaging afterburner, at 18,000 feet MSL and decelerating through .94 Mach, both crewmembers heard a loud bang which was initially interpreted as a compressor stall. The right engine fire warning light then illuminated for 2 to 3 seconds and extinguished itself.

Captain Ritt immediately directed the aircraft toward Gila Bend Air Force Auxiliary Field, the closest emergency field, and called his wingman to rejoin and make a visual inspection for damage. The wingman relayed that the aircraft was trailing fire, smoke, oil, and vaporizing fuel from the right engine and engine bay area. Captain Ritt requested and received positive confirmation that the right engine was the affected engine prior to accomplishing the shutdown procedures. Smoke and fuel continued to vent from the engine after shutdown; however, the fire had extinguished.

Captains Trevino and Ritt declared an emer-

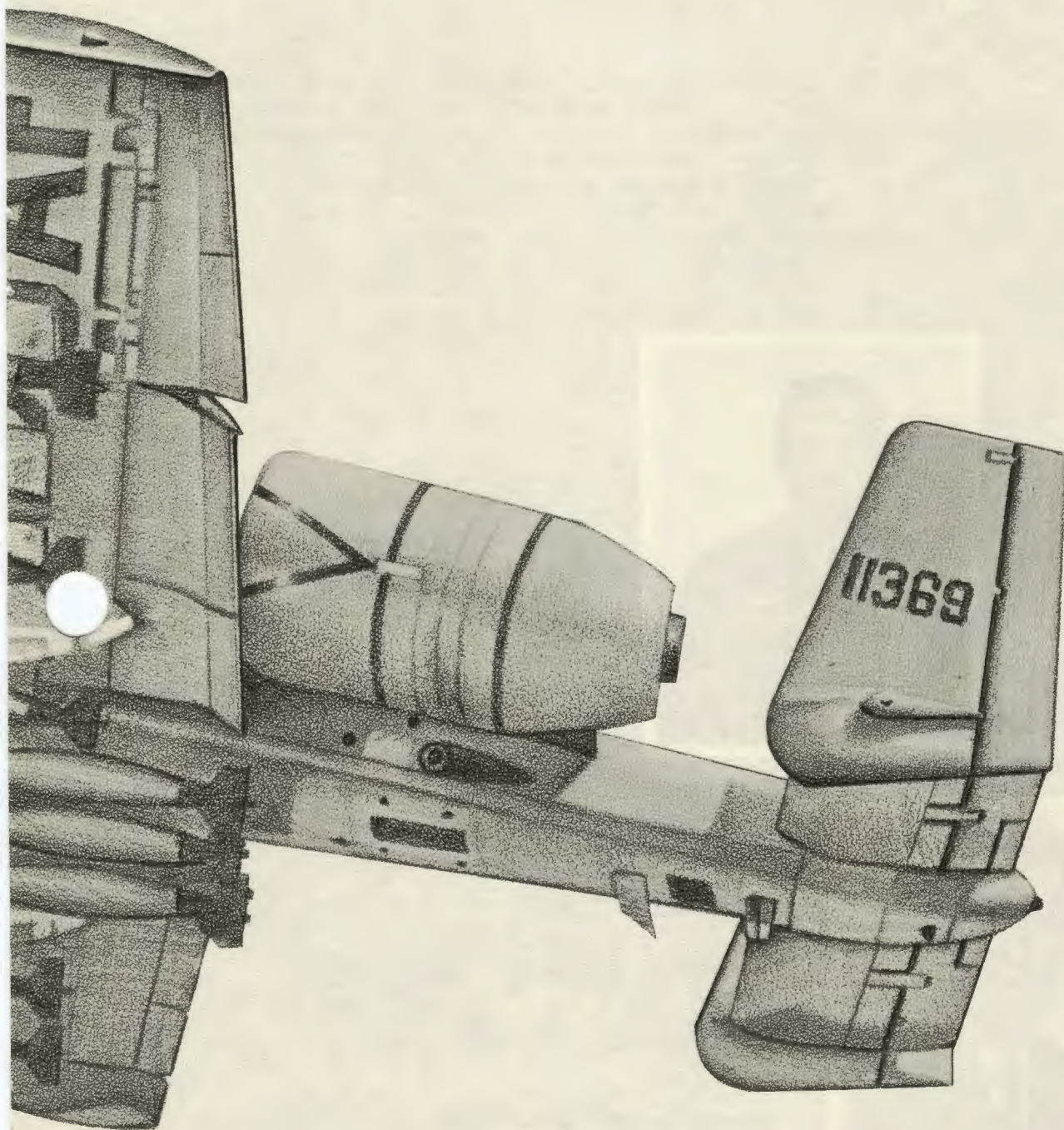
gency and set up for a single engine landing. Throughout the approach, the aircraft continued to vent smoke and fuel. The crew executed a perfect single-engine approach and landing. After shutting down the left engine, both crewmembers egressed the aircraft which was gushing heavy smoke and fuel.

Investigation revealed that two pairs of turbine blades and a dovetail from the number three turbine rotor had separated and penetrated the turbine case, puncturing number four and five fuel cells. Maintenance specialists determined that prolonged flight would have caused catastrophic engine failure with possible loss of the aircraft.

The superior airmanship, prompt reaction to a grave inflight emergency and professional competence demonstrated by Captains Trevino and Ritt resulted in the saving of a valuable tactical fighter and averted possible injury or loss of life. Their actions qualify them as the Tactical Air Command Aircrewmen of Distinction. ➔

A-10





James H. Brown



INDIVIDUAL SAFETY

We are proud to present the Tactical Air Command Individual Safety Award winners. The total contribution made by these men to our mission will never be known ... we have no way of counting accidents that have been prevented. Selection for the highest Tactical Air Command award in their individual field is our way of recognizing outstanding efforts in behalf of accident prevention. We at TAC Safety would like to add our congratulations to the many they have already received.



Outstanding Flight Safety Officer

Major Stanley J. Smith
354th Tactical Fighter Wing
Myrtle Beach Air Force Base, South Carolina



Outstanding Ground Safety Award (Individual Category)

Technical Sergeant Herbert E. Everett
347th Tactical Fighter Wing
Moody Air Force Base, Georgia

AWARDS FOR 1976



Outstanding Weapons Safety Officer

Captain Manuel D. Pesola
4th Tactical Fighter Wing
Seymour Johnson Air Force Base, North Carolina

Outstanding Contributor To Weapons Safety

Senior Airman Bobby L. Franklin
23d Tactical Fighter Wing
England Air Force Base, Louisiana



Outstanding Weapons Safety Noncommissioned Officer

Technical Sergeant Billy J. Forrester
388th Tactical Fighter Wing
Hill Air Force Base, Utah



PLACE THE FACE



This F-86F crew chief was assigned to the 12th Fighter Bomber Squadron, 18th Fighter Bomber Wing during July 1953.

Our third "Place the Face" personality was a little more difficult for everyone to identify. However, the response was still super. Keep those cards and letters coming.

The winner of our February contest was Senior Airman Roberta Ward, 27th Tactical Fighter Wing, Cannon Air Force Base, New Mexico. Airman Ward correctly identified the F-84 pilot as her former Wing Commander, now TAC Assistant Deputy Chief of Staff/Operations, Operations and Training, Brigadier General John H. Bennett.

Airman Ward will receive the coveted "Fleagle Fanny Feather of Fate Award."

This month brings the photo of an F-86F crew chief - can you "Place the Face"? Send all responses to:

TAC/SEPP
Langley AFB, VA 23665

Be sure to include your name, rank, duty title, etc. Also, date the letter. Good luck. ➤

chock talk

SIDEWINDER GETS BENT BEAK

The missile shop shift supervisor dispatched two technicians to pick up and return an AIM-9B training missile which had been used for academic training. In removing the missile from the classroom to the hallway, it was necessary to raise the fin and lower the nose end. Once through the door, the man at the nose end adjusted the missile to a level position resulting in his hold becoming awkward. Approaching the trailer, it became increasingly difficult to maintain a hold on the missile. When he attempted to lift it onto the trailer, the missile slipped from his grasp and fell to the ground, breaking the IR dome assembly and gyro on the guidance and control unit.



Could have happened to anyone - right? Yes - but the mishap could have been prevented. TO 21M-AIM 9B-2 contains a caution which states: "A minimum of three people should be used when handling an assembled missile." Despite this caution (remember, that's "Operating procedures, practices, etc, which, if not strictly observed, may result in damage to equipment."), the shift supervisor only dispatched two people. Sure enough, \$1,497 damage to equipment resulted all because someone didn't follow the TO. A lot of time and money was spent developing guidance and procedures to help you maintain and load aircraft. Use it ... it will help you do better job.

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



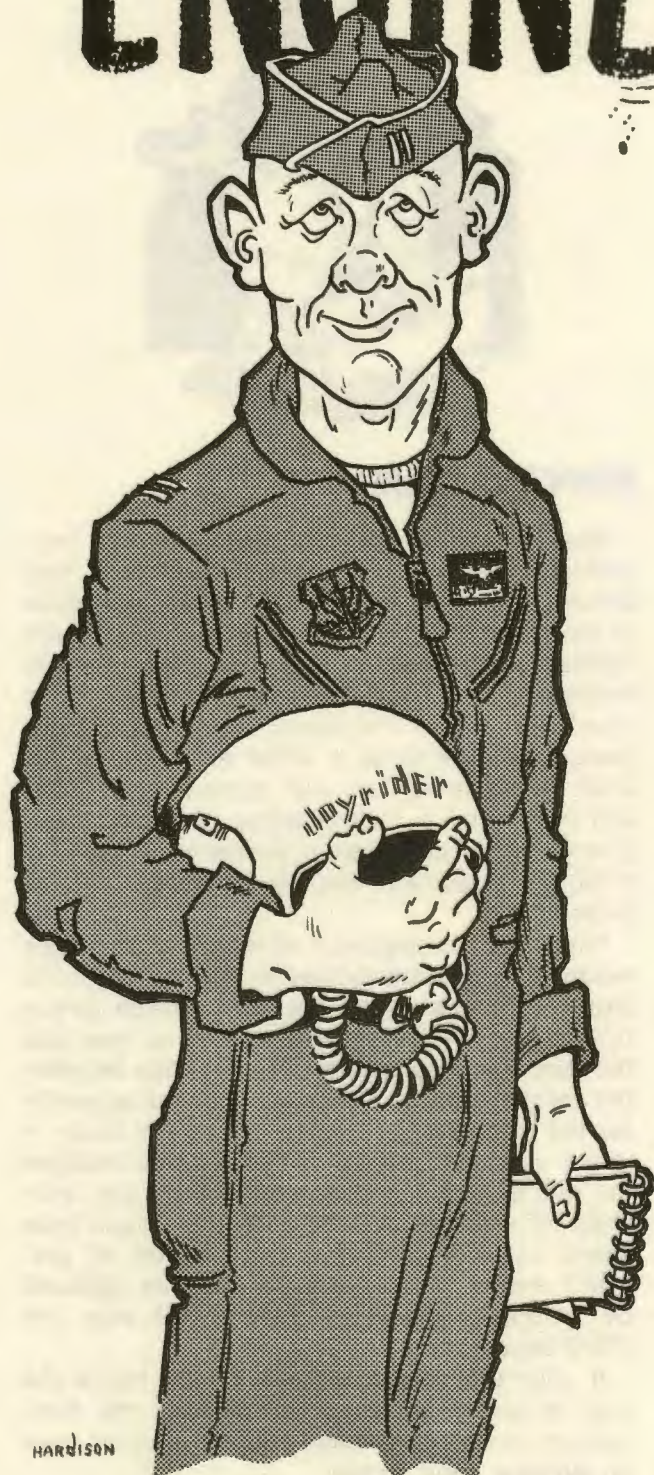
FLIGHT CONTROL FOD

After takeoff, the IP in the Phantom's rear cockpit attempted a right turn at 1,000 feet above the ground, but the stick would not move to the right. The pilot in the front cockpit took control of the aircraft and found normal left movement, but only one-quarter inch of right travel. The aircrew requested vectors for landing using only right turns in order to have good aileron available for roll out, burned down fuel, and performed a controllability check. A chase aircraft noted no external problems, so a long straight-in approach was flown and the aircraft landed safely.

Post-flight inspection revealed a compass mode selector knob lodged in the lateral control stop mechanism under the front cockpit torque tube shield. The knob had worked its way into the stop gap mechanism through a gap between the torque tube shield and the guard assembly for the front cockpit control stick base cover. A guard assembly, PN 32-32593-21 was installed on the aircraft. This assembly was one inch short of mating properly with the torque tube shield assembly and was installed on all pre-1969 model F-4s. This assembly was replaced by a longer one (PN 32-61034-1) after the 1968 series.

If your unit has pre-1969 F-4Es, check the type of guard assembly installed on the front cockpit control stick base cover ... it could save an airplane - and a crew.

ENGINEQUAKE



By Lt Col Lester G. Frazier
366th TFW
Mountain Home AFB, ID

Several of us were sitting around the other day wondering why the insert pages to our checklists are always manufactured just slightly larger than their plastic holders when someone asked how the SOF program was progressing. Now, we're proud of our SOF program out at Mount Idy, and we had an occurrence the other day that brought several different people in on the successful conclusion of an airborne emergency.

The situation developed early one bright Idaho day - the kind of day that prompted the National Association of Weather Forecasters to vote southwestern Idaho as having the "best four seasons weather in the United States."

A flight of two scheduled for a practice bombing mission, launched at 0700 local. Oogahonk 02, the number two man, was Captain Jim Joyrider. Joyrider's preflight, engine run-up, and takeoff were all normal.

On the departure at 1200 feet AGL and 350 KIAS, Joyrider pulled the aftergrunts out and stabilized his RPM at 94 percent. Twenty seconds later closing nicely on leader at 380 KIAS increasing, the number two engine delivered the dreaded puckersonic TF-30 Pratt-Whitney KAWAMP! RPM decreased through 88 percent accompanied by moderate vibrations as Joyrider and his right-seater, Captain Sherman Goose (Guy Operating Other Seat's Equipment), climbed down from the ceiling and pulled old number two back to idle. Back at idle, the vibrations ceased so Joyrider with his closure rat

Oogahonk 01 decreasing, pushed the throttle back to military in an attempt to see if something bad was actually happening to him. It was the engine once again tried to shake itself out the tailpipe. So, Joyrider turned the throttle off and hit the fire pushbutton - just like the Dash One said he should have done in the first place.

He called Oogahonk 01 and told of his troubles. Oogahonk 01's right-seater, Lt Chuck Vogel, picked Joyrider up at 5 o'clock. His left-seater, Capt Perry Trotter, ordered the Joyrider to turn onto a high, wide downwind. Trotter slammed his wings forward to 16 degrees and bent his bird around to the right in order to join on Joyrider.

Departure Control, listening to the developing situation, telephoned the SOF and told him what they knew of the pending emergency. Departure Control also told the SOF to expect recovery on local Channel 17 if an immediate landing was necessary.

Meanwhile, Oogahonk 01 was coming aboard, flying chase, on Joyrider's left wing. Joyrider asked about dumping some of the 28,000 pounds of fuel on board, but Trotter nixed the idea as he could see gray smoke streaming from the shutdown right engine. As Oogahonk 01 crossed behind Joyrider from left to right, both crewmembers could see scattered yellow fires burning in the tailpipe.

Trotter called, "Two, it looks like you have a fire in number 2 engine."

Joyrider, who had never had a fire indication, hit the agent discharge, and the fires went out after burning another 60 seconds.

Departure Control heard Trotter's fire call and informed the SOF. The SOF asked, "Can I have 'em up on button 17?"

Departure Control responded, "You got 'em."

By this time, the two aircraft had progressed to a wide base leg for an ILS. As they came up on Channel 17, Trotter declared an emergency with RAPCON and the SOF reconfirmed that "ENGINE FIRE" procedures had been complied with. He led the crew through the single engine landing procedures and also confirmed the final approach speed for 27,000 pounds of fuel.

At three miles on final approach, heavy black smoke began to roll out of the main wheel well. The smoke was so dense that Oogahonk 01 prudently moved it out to a safe distance.

Joyrider's white belly strobe light, buried in the smoke, gave Trotter the impression of a flashing

magnesium fire. When Trotter called out the smoke, Joyrider's right-seater switched the air source selector knob to EMER and the smoke disappeared.

The SOF, both seeing and hearing about the smoke rolling out of Joyrider's airplane, had to make a quick decision. He had no idea what damage, if any, had been done to the main landing gear and wheel well area. And he sure didn't want to direct a single engine fly-by to check the aircraft for possible damage. His decision made, the SOF transmitted, "Oogahonk 02, drop your hook, lock your shoulder harness, and take the approach-end cable."

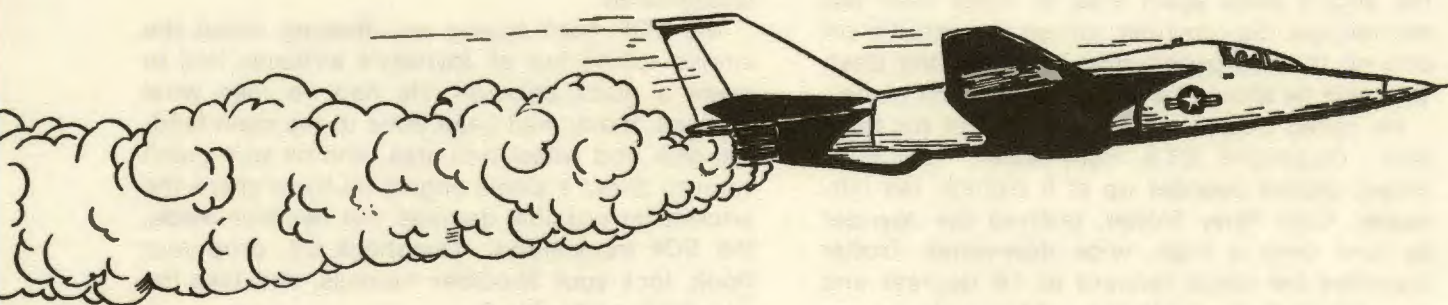
Joyrider heard, did, and came to an uneventful stop on the runway exactly 8 minutes after he took off.

Let's take a look at what happened during those 8 minutes: When the Joyrider deselected supersmash and stabilized his RPM at 94 percent, the heat flowing across the turbine blades cooled down. Constantly varying the temperature across these blades decreases their life. In fact, we have a TCTO which was developed to rework the first turbine wheel blade cooling and stress concentrations in an attempt to prolong engine life.

At 677.3 hours engine time, Joyrider's number one turbine wheel in the right engine gave up one of its blades. The blade carried



ENGINEQUAKE



back through the other three turbine wheels picking up additional blades as it smashed rearward. The loss of the blades unbalanced the turbine shafts causing a compressor stall that Oogahonk 02's crew interpreted as a KAWAMP. The vibrations that the crew felt were caused by the unbalanced turbine shafts spinning out of sync. Of course, when the power was pulled back, the vibrations diminished. Incidentally, unbalanced turbine wheels and shafts cause a heap o' trouble with oil lines and seals. The gray smoke that the crew of Oogahonk 01 witnessed while coming aboard was oil leaking from broken lines and seals.

The yellow fires inside the tailpipe noticed by Trotter and Vogel were residual fuel and oil burning off. The fires were of no particular concern, but neither crew had any way of knowing it. The fires burned themselves out and were not put out by the agent discharge because the discharge is directed around the engine, not through it.

Trotter's recommendation not to dump fuel was a good one. Turbine blade failure can set up vibrations strong enough to break, bend, and generally muck up all sorts of engine components. Also, an aerodynamic law of physics states, "Anyone pumping raw fuel through a busted up engine is going to die in the sky." Fortunately, but unknown to either crew, nothing had been broken but oil seals, lines, and turbine blades.

TAC Sup 1 to AFR 60-2 states that the SOF will not appropriate an air traffic control microphone without the shift supervisor's permission. However, Departure Control, in following the developing emergency, had already started their homework. They could tell things were not progressing normally and called the

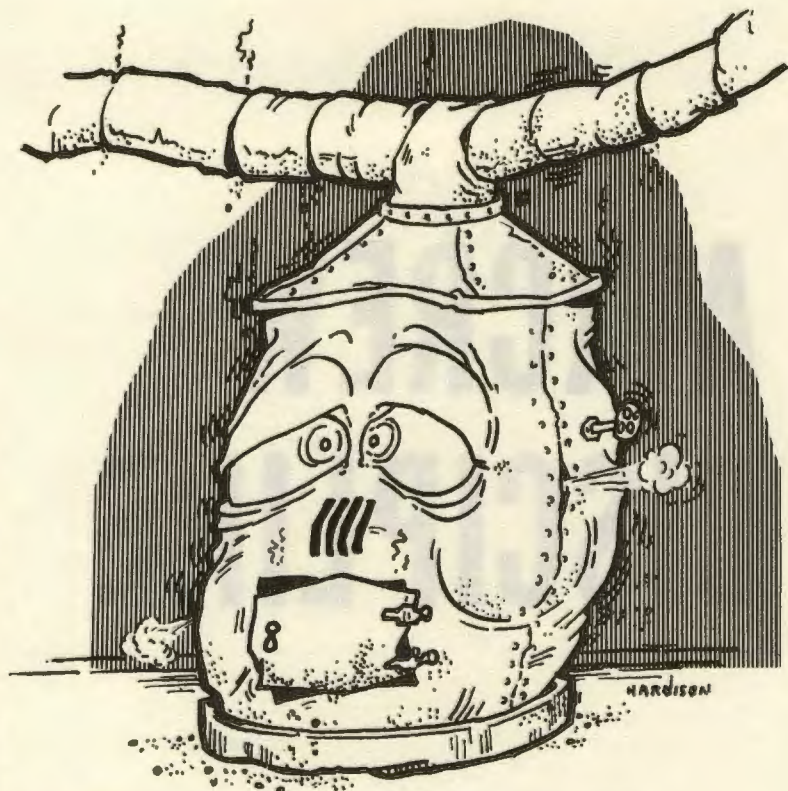
SOF to tell him one of his birds was experiencing engine difficulty and RAPCON was clearing Channel 17 for his use. Departure Control called the SOF once more, told him it looked like his bird had an engine fire, and to meet the bird on Channel 17. When the SOF came up on 17, it was just in time to hear the emergency being declared. The SOF read off and confirmed ENGINE FIRE DURING FLIGHT checklist procedures had been accomplished and worked the crew through the single engine landing checks. The critical points here are that the SOF wanted to make sure that Joyrider would be able to land his aircraft safely, but SOF also wanted him down as soon as possible. When the bird started smoking from the wheel well area, SOF was not going to take precious seconds determining the cause. In fact, the cause of the smoke is still unknown. The experts tell us that the only way for smoke to get from the engine to the wheel well is to burn through - and there was neither fire nor smoke damage in the wheel well area. Another aerodynamic law of physics may be stated, "When things are going to hell in a handbasket, the aircraft in distress can be counted on to come up with another handbasket."

In any case, SOF knew it could be hot in the wheel well area - hot enough to burn the tires. So, he had Joyrider pull the hook for an approach-end engagement rather than take the chance of a directional control problem on touchdown.

One final point: Out here at Mount Idy, when practical, we have emergency aircraft shoot an ILS, backed up by the final controller. This gives us more flexibility for those sometimes necessary transmissions on short final.

Have a nice day. ➔

DOWN TO EARTH



EXPLOSIVE RUST

**By Lt Maynard R. Shepherd
132d TFW (ANG)
Des Moines, IA**

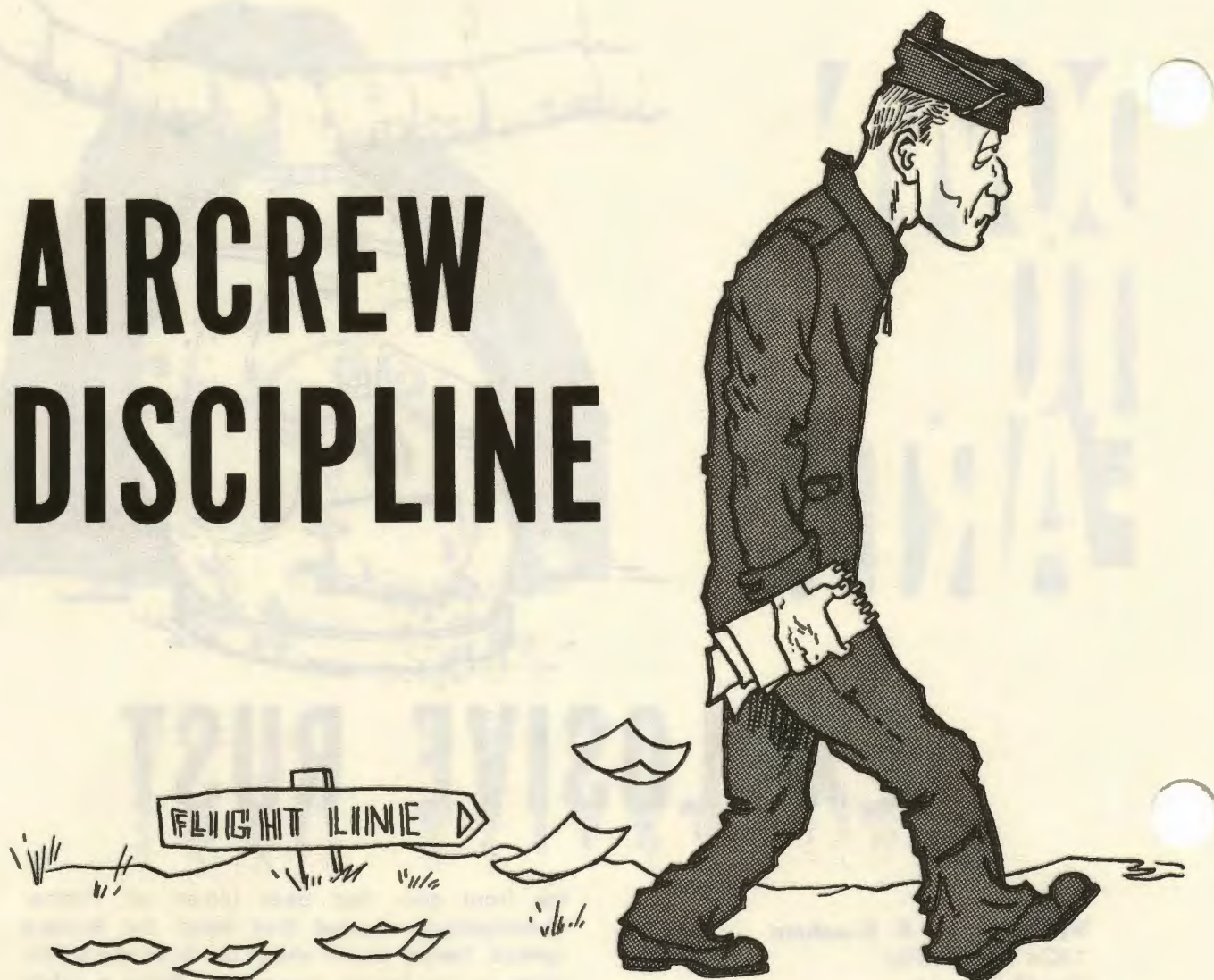
Iowa is known for its cold, severe winters. Lately, we have been experiencing wind-chill factors as low as -50° F. That's cold in anyone's book and points to the necessity for making sure one's gas furnace is working properly. One such individual in our unit does just that by vacuuming all dust and dirt from the floor inside the furnace, changing filters periodically, and inspecting the furnace for signs that could impair its performance. The only problem is, he didn't look far enough ... and it almost cost him his house. For some time, our friend reported that when the furnace would light, he could hear a loud "thump" like the sound of a muffled explosion. He didn't think too much of it until one morning the "thump" was louder than usual. Upon inspecting the furnace area, he found that

the front door had been blown off. Further investigation revealed that when the furnace ignited, flames would shoot out from the air intakes on the burner assemblies. Being a safety conscious individual, he shut off the furnace and called his local repairman.

When the burners were removed and inspected, it was discovered that rust had formed inside the cast-iron burners (about 3/4 of a cup of rust was removed from one burner), restricting the flow of gas to the burner head. Because of this restricted flow, it took longer for a combustible mixture to reach the pilot light. During this time, a larger than normal volume of gas was injected into the burner area; some of it flowing out the air intake and filling the area in front of and below the burners. The result was an explosion sufficient to blow off the front panel of the furnace.

The story has a happy ending. The burners were cleaned and are now working properly. Our man did learn, though, that proper maintenance of his furnace sometimes requires more than meets the eye.

AIRCREW DISCIPLINE



By Col Bill Patton
Chief, HQ TAC Stan Eval

Put yourself in a fighter cockpit, involved in a TAC-directed exercise, with a preplanned target to hit. While you wait in the arming area, your thoughts flash back to the preceding "night on the town" ... it was a long night and that wake-up at 0630 came too early ... but there's plenty of time for sleeping as soon as you complete this "milk run."

Finally armed and cleared for takeoff, our intrepid aviator runs the go-fast knob forward and heads off into the blue. Fly the route - timing going good - cleared in hot - arm 'em up and get ready to show those other jocks how the

world's greatest fighter pilot goes about doing his usual superb work.

There's the valley I'm looking for - road coming in from the right. Oops - missed my pop point! Oh well, "leads up" - that target is awfully close - this is really gonna be tight.

If, at this point, you are saying to yourself, "Son of a gun - I've been there before," then you're fortunate to be able to read this article. Others have not been so lucky. We TAC Stan/Eval weenies have been looking into why we lost airplanes and aircrews at such an alarming rate in 1976. True, we are doing a ton of new things, e.g., Red Flag, Blue Flag, etc. Still, the same basic rules of airplane driving apply. Some directives have changed - mostly due to aircraft accidents and an effort to prevent future accidents. But, still we go back to the biggest rule of all: IF IT AIN'T SAFE - DON'T DO IT.

We teach it, preach it, write it, evaluate it, and hear it until it comes out of our ears, but we still bash air machines. Aircrew DISCIPLINE, SELF-DISCIPLINE, COMPLACENCY - whatever you want to call it. Foul-ups by aircrews who should know better are causing accidents.

Let's go back to our hero at the beginning of this article. What's he trying to prove by hootin' and playin' all night, then trying to fly the next morning? What's the pressure on him that keeps him from aborting the pop-up attack when he realizes he messed it up with a late pop? Is it the meat between his ears, or doesn't he know the capability of his air machine, or is he complacent? It could be all three. There are other examples:

A true-blue wingman watches his leader roll in on a target and says to himself, "He can't make that." Sure enough, he didn't. SMACK - right into ole terra firma. Did the wingman warn his lead? NO. Did he hit the mike button and advise that they were in too close for a safe delivery?

Q. Was he a concerned and interested fighter pilot? APPARENTLY NOT.

A four-ship coming home from the range with number three asking for a "straightin" due to "fuel considerations." What does this tell the tower operator who is busy trying to recover eight other fighters? Nothing. Number three never declares minimum or emergency fuel. When told he cannot be cleared "straight-in," he lands anyway - right in the middle of a four-ship that was recovering via the overhead pattern!

Aside from number three's errors in judgment, how about his leader? Did he brief Joker and Bingo fuels? Was his briefing well planned and informative or did he lull the flight members to sleep with another "HO HUM" briefing? Who knows. Did he adequately control his flight once off the ground? Doesn't look like it. Did he exercise the authority and carry out the responsibility vested in him by his commander? NO.

Again, we come back to AIRCREW DISCIPLINE AND SELF-DISCIPLINE. It's time that we got on with being good fighter pilots and using the ole gray matter to keep us alive. So, take a long look yourself. Be sure you are mentally and physically prepared to fly. If not, tell it to a

squadron supervisor and stay out of that cockpit until you are "RIGHT." Once airborne, stay alert - expect the unexpected - all the time. Plan your attack and if it doesn't work out - ABORT. After all, we can't be perfect all the time. Most important - if you recognize a deteriorating situation, DO SOMETHING. Either abort the pass if you messed up, or tell your wingman or leader to abort if he's messed up. Don't sit there and watch your friend try to salvage a maneuver that you know was "impossible for him to make."

We in TAC are in the midst of another challenging year. Stop for a minute and think about DISCIPLINE and the lives that depend on it.

Be smart - be alert - be disciplined. ➤



THE CURSE



**By Col Richard C. Jones
13 AF/SE
Clark AB, PACAF**

It is a very normal and human feeling to want to be recognized as a special person - an individual who has accomplished something different from the majority of his, or her, contemporaries. It may be based on superior, sustained performance, or demonstrated by unequalled courage or fortitude. Perhaps this recognition

OF A HERO

was earned by being the hero in an athletic contest, during a battle, saving another person's life, or being daring. Obviously there are thousands of ways a person can be recognized as being unique, doing something significant or different. This innate human desire reminds me of some philosophy presented by Dr. Chaytor D. Mason, resident psychologist, at our USAF Flying Safety School, University of Southern California at Norton AFB. Dr. Mason offered some basic thought-provoking ideas regarding manhood and safety. He stated that safety must function in our present culture with a very curious curse. That is, the startling conclusion that any person interested in doing things "by the book," or those who are motivated to consider their own welfare when undertaking any task, are just too cautious and too frightened to play the game well, lead a mission, or give the assignment the fullest measure. Consequently, the individual must be removed as a participant or a team member. Additionally, Dr. Mason indicated that individuals possessing characteristics associated with self-preservation rarely are recognized as leaders by the "special people" in our hero-worshiping society. This is a sad, but a realistic truth relating to our own human self-appraisal. Many human beings, it appears, will disregard all precautions, expressed or implied, in the performance of any job, assignment, position, or mission that could in any way signify cowardice. I am sure you will agree we have lost many fine aircrew members that way - in aircraft, cars, motorcycles, boats, and by thousands of other means. Also, hundreds of millions of dollars in equipment and valuable resources have been wasted. Another item - it is just not possible to measure the grief or sadness for those the victim left behind.

It's a strange heritage which decrees that we humans are courageous only when we disregard caution and safety equipment, established procedures, checklists, tested methods, speed limits, or other rules which enhance safety, mission accomplishment, or ensure a longer life.

It's an inherited, yet strange curse, which causes a person to eulogize such an indifference to leadership and discipline. It also promotes poor judgement, inefficiency, and negative attitudes. In order to remove this curse, Air Force personnel must be shown that it's a better deal to do things "by the book" - that we cannot afford the unique or unusual way offered by those who believe that to be a hero you can't follow tested ways, limits of any type, or what past experience would dictate as a right method. Successful missions, or projects are normally the direct result of team effort; and team effort can only be achieved by following the established "game plan."

If we are unable to change the image or philosophy of what it takes to be a hero, or go-getter, or a mission hacker, then we must be willing to accept the same old disappointing accident statistics year after year in all areas of our Air Force operation.

Remember the accident where the aircrew violated air discipline and decided to "roll-the-bird" right after takeoff and be a hero for friends on the ground? It's possible to get away with this type of heroism sometimes. The time you don't make it, you become a statistic, a smoking hole that others left behind are briefed about. It's amazing how this individual is eulogized by many of his contemporaries. Like, "Gee, Charlie was the greatest stick and rudder jock I've ever seen." "Heck, it couldn't have been pilot error. Charlie has done that beautiful trick hundreds of times."

The solution is obvious. Hero tactics cannot be tolerated by professional flying or maintenance organizations in today's Air Force. Costs are too high and life too dear. Let those who want to be heroes earn that title in the game room or on the athletic field. Give me the professional aircrew or ground crew member who wants to follow the game plan, do things by the book, and contribute to safe mission accomplishment.

How about you, do you have this hero curse?



Fleaglegrams

Members of the 20th Special Operations Squadron "Green Hornets" will hold a reunion at Hurlburt Field, Florida, from 13 through 14 May 1977. Any persons associated with the Green Hornets are cordially invited. Contacts are Capt Ron Merriott, Autovon 872-7438; and Capt Frank Waid, Autovon 872-6471 or home (904) 581-2342. Persons knowing the addresses of any Hornets are requested to send same to the 20 SOS, Hurlburt Fld, FL 32544.

Dear Fleagle

Rumor has it that if you are stationed at Mountain Home AFB, Idaho, and do not own: (a) a motor home, (b) a cabin in the woods, or (c) a fishing boat, you will be placed on the control roster. This is not true. Rumor also has it, because of the flatness of terrain, the First Sergeant can still see you even if you've been AWOL for three days. This again is fraudulent information. The fact is: You must be in the control tower to see anyone who has been AWOL over a period of 48 hours.

Which brings me in a circumlocutive manner to my subject of the Supervisor of Flying briefcase. Since the inception of the SOF program at 0730 local, 29 February 1872, briefcase, leather, type IV, Class 1, Federal Spec. MM8-650-A (See "Before" picture) has been used down through the ages by the SOF to carry his required publications and equipment. As can be seen, the standard briefcase no longer meets the SOF's requirements, therefore, we design engineers, with the aid of the Air Force micrometer, chalk, and ax have come up with a SOF kit that can be both carried off the shoulder or high upon the back for SOFs mucklucking up to the control tower.

Preliminary field testing indicates that the kit, while completely viable in the backpack mode, is under critical review in the shoulder bag configuration. Apparently a few of the SOFs have been whistled at by the Comm guys as they flounced their way back to work.

Notice that in the "after" picture, there are separate containers for each article(s) required by our SOFs at this station. We feel that the kit can be easily modified to fit the requirements of any base which wishes to cut down on the herneated nucleus



BEFORE



AFTER

pulposus and inguinal rupture incident rate.

Sgt Mark Pittman of our parachute shop helped with the design and constructed the kit. Call him at Autovon 857-2446 if you would like any information on construction technique.

Quick: What's the BOLDFACE for being too safe for a low approach?

Aerospatially yours
Lt Col Les Frazier
366 TFW "Gunfighters"
Mountain Home AFB ID

Dear Les

Thanks for the tip. I'm sure all the SOFs who have to trudge to the tower with 80 pounds of regulations, manuals, radios, etc., will be highly interested. The last time I ruptured my iginual I was laid up for two weeks and I'm not about to let that happen again.

Fleagle

TAC TALLY



	TAC			ANG			AFR		
	FEB	thru FEB		FEB	thru FEB		FEB	thru FEB	
		1977	1976		1977	1976		1977	1976
MAJOR ACFT. ACCIDENTS ▶	4	4	6	1	1	2	0	0	0
AIRCREW FATALITIES ▶	2	2	2	0	0	1	0	0	0
TOTAL EJECTIONS ▶	2	2	3	1	1	1	0	0	0
SUCCESSFUL EJECTIONS ▶	2	2	3	1	1	1	0	0	0

TAC'S TOP "5" thru FEB

TAC FTR/RECCE accident free months	
16	4 TFW
11	366 TFW
10	474 TFW
9	49 TFW
8	56 TFW

TAC GAINED FTR/RECCE accident free months		
59	127 TFW	ANG
27	132 TFW	ANG
25	156 TFG	ANG
20	122 TFW	ANG
20	117 TRW	ANG

TAC/GAINED Other Units accident free months		
115	182 TASG	ANG
95	135 TASG	ANG
87	507 TAIRCW	TAC
84	193 TEWG	ANG
82	602 TAIRCW	TAC

MAJOR ACCIDENT COMPARISON RATE 76/77

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

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

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

FLEAGLE

...SCATTERED CBs ENROUTE. DESTINATION
WILL BE ONE THOU OVERCAST, TWO MILES IN
THUNDERSTORMS...

CBs, THUNDERSTORMS..
WONDER WHAT'S THE
DIFFERENCE ?

LOCAL WEATHER PEOPLE

HARDISON

JUST A CUMULO-NIMBUS...
I'LL KEEP ON GOING.

THUNDERSTORM !!

FLASH!

THUNDER!
CRACK!

I EMPHASIZE... CBs AND
THUNDERSTORMS ARE THE
SAME BAD HOMBRE !!

NOW HE
TELLS ME !

INSTRUMENT
REFRESHER

© Stan Hardison, 1977

Idea: Courtesy of Maj Dave Douglas, TAC Staff Weather Office