

TAC ATTACK

MARCH 1979

J-CATCH
...Pg. 24



DAVID
BARRIA

MAR



READINESS IS OUR PROFESSION

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Angle of Attack

FOD--- THE ATTITUDE

I'm sure you've seen the television commercial about a popular brand of engine oil which states, "You can pay me now---or you can pay me later". With engine foreign object damage (FOD), "pay me now," is our prevention effort, and "pay me later," is more than just the dollar cost of repairing the engines. It also includes aircraft downtime, engine overhaul, additional maintenance hours, loss of sorties and possibly, the loss of an aircraft and aircrew.

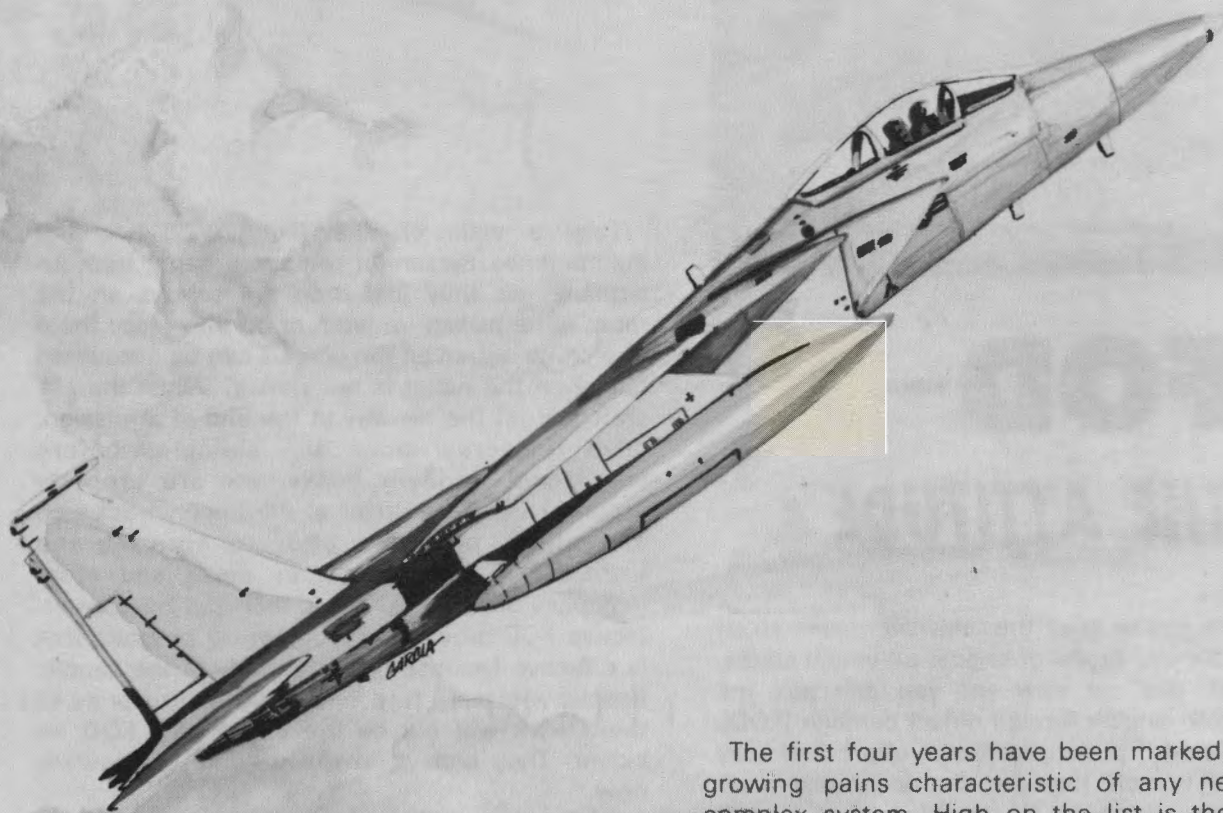
The command FOD rate has been gradually decreasing over the last few years, the direct result of our "pay me now" efforts. Although our rate has slowly decreased, the dollar cost of FOD has not appreciably changed. Some of our new engines equal--or exceed--the total cost of earlier fighter weapons systems. We have improved our rate, but we will also have to continue that improvement. How can we continue to improve? Involve our people.

Take a walk on the flightline. When the maintenance personnel remove a panel from an airplane, do they just drop the screws on the ramp to be picked up later, or do they place them in a container so all the screws can be accounted for when the panel is reinstalled? When the aircraft taxi off the runway at the end of a mission, does the crew open the canopies before checklists, letdown books, etc are properly secured? Does the driver of the Supply truck stop and check his tires prior to entering the flightline? If the people in these and other instances do the right thing, then you have an effective FOD prevention program---a program that is effective because of the attitude of the people. People who care and people who take pride in their work will not be the cause of a FOD incident. They believe in the wisdom of "pay me now."

FOD can be prevented without too much effort. There is nothing mysterious about a screwdriver, bag of seat pins, or cigarette lighter that is swallowed by an engine. Prevention is everyone's responsibility---it cannot be delegated. If you don't believe in prevention, be prepared to "pay me later."

RICHARD K. ELY, Colonel, USAF
Chief of Safety

"STALL/STAGNATION- THE PILOT FACTOR"



Colonel Art Bergman
TAC/LGQ

Maj Skip Weyrauch
TAC/SEF

It's been nearly seven years since the Pratt & Whitney F100 turbofan engine logged its first flight, and just four years since the F100, dual-mounted in the McDonnell Aircraft F-15 Eagle, joined the TAC inventory at Luke AFB. This year, the F100 became operational in the single-engine role, powering General Dynamics' F-16, now at Hill AFB.

The first four years have been marked by the growing pains characteristic of any new and complex system. High on the list is the stall/stagnation problem. To be sure, the record shows a dramatic decline in stall/stagnations over the past four years. But even an occasional incident is cause for concern--it may cost you a sure "kill", it may result in an air abort, and very frequently it costs a lot of maintenance manhours. Let's look at the record. We're currently experiencing 1.8 stagnations per 1000 engine flight hours; that's an 80% reduction since early 1975. Part of the reason for this decline is design changes to the engine; and there are still more just around the corner. The 49TFW is evaluating the proximate splitter, a

device that separates the fan and core engine airstream to prevent an augmentor pressure pulse from entering the core. (This phenomenon has caused most of the stagnations in the past) To date, the results at the 49th have been extremely promising. But there is another problem, and that's the pilot factor. The F100 requires more TLC than engines such as the J-79. A lot of folks feel that our experienced jocks

deserves some healthy respect! We've asked an awful lot of the F100 engine...and it can deliver, provided we treat it right.

Compared to the rest of the jet engine community, the F100 is still a "youngster." The J79 came out in the early fifties--making it older than a lot of guys currently flying it or the guys and gals maintaining it! So we need to give this "youngster" some understanding and TLC.

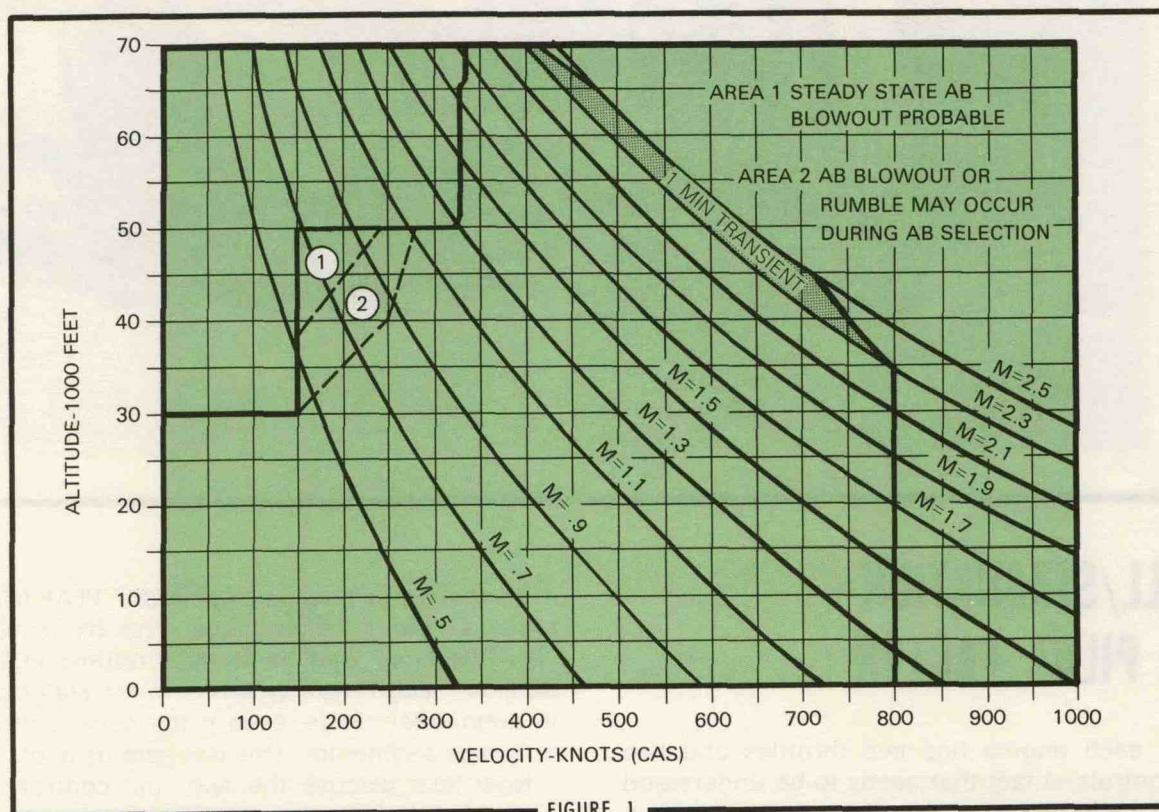
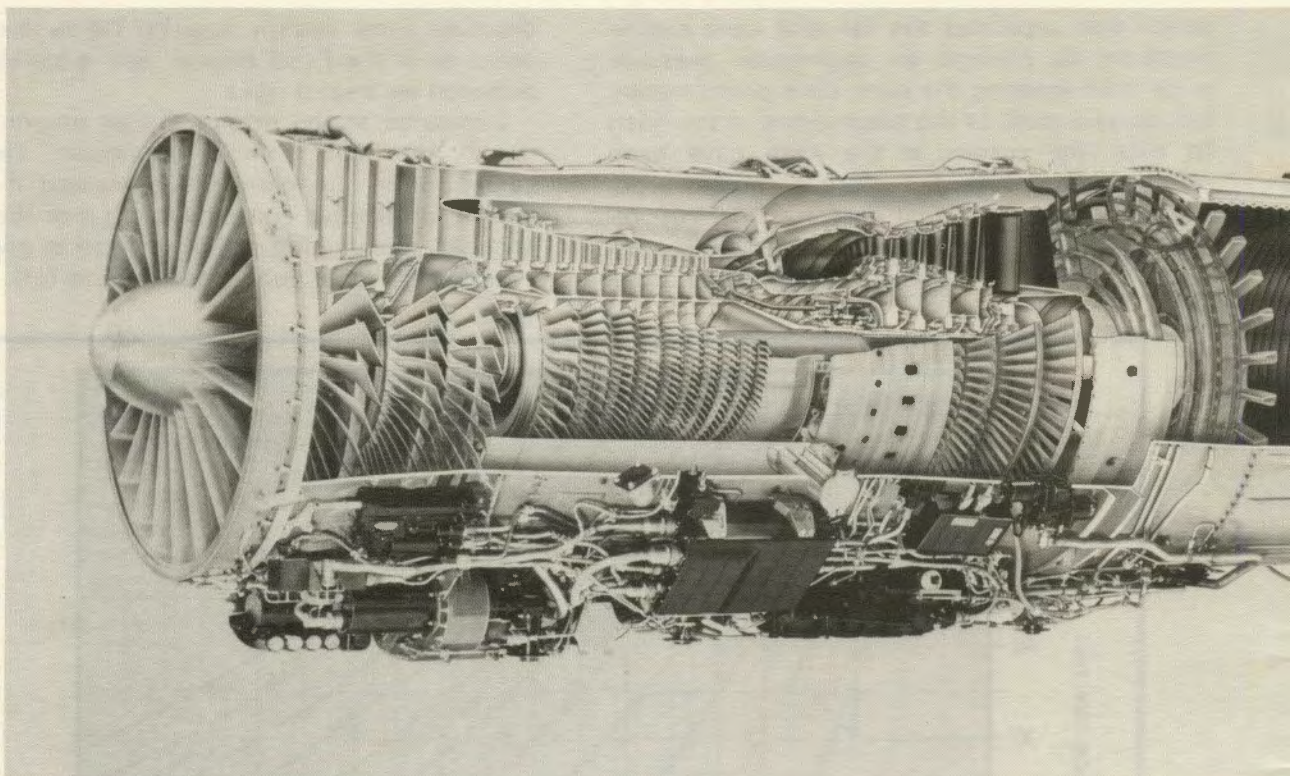


FIGURE 1.

don't have as many problems as the newer guys do. So we're down to the real "thrust" of this article (pardon the pun): short-cutting the learning curve. So let's start by reviewing some of the ways in which the F100 differs from its predecessors, and see how we can apply that knowledge to get better performance. The F100 engine is really a new generation in jet propulsion. It weighs a thousand pounds less than the J79, but it packs five thousand pounds more thrust into its 191 inch long frame. Its 23 to 1 compression ratio helps give it an 8 to 1 thrust to weight ratio--a twenty-five percent improvement over the best previous engines. Ergo - it

We also have to understand the engine flight envelope as shown in Fig. 1. Stalls and stagnations have occurred throughout the envelope, but most of the problems occur in the upper left-hand corner--slow airspeed and high altitude. However, the operating envelope is not as definitive as the chart would suggest. The boundaries can shift for lots of reasons--some of which are engine trim, angle-of-attack, yaw, etc. Therefore, you're not home free just because you're dead center in the fat part of the envelope.

Understanding this "youngster" also requires some knowledge of what's inside an F100. To

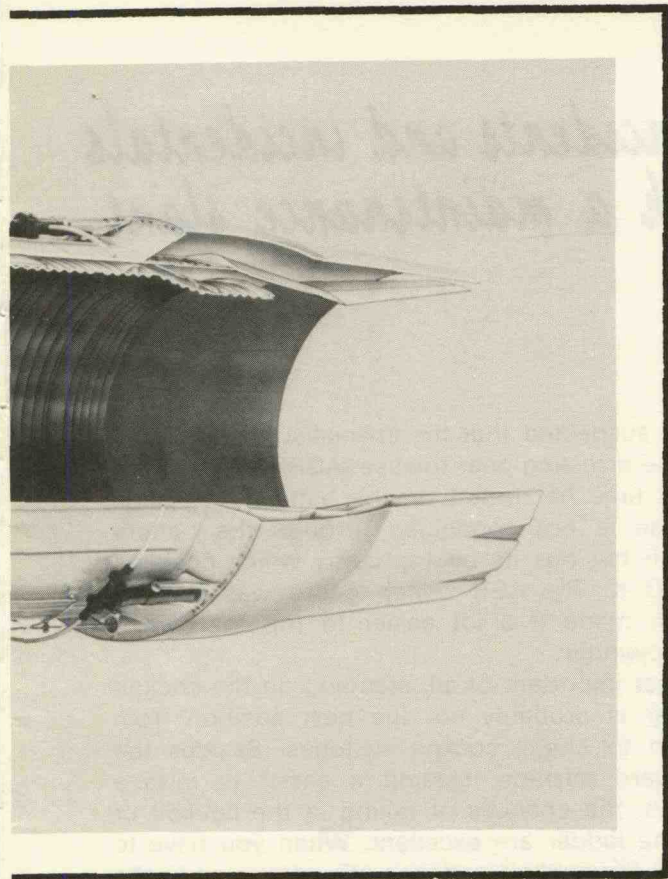


STALL/STAGNATION- THE PILOT FACTOR

begin, each engine has two throttles and two fuel controls--a fact that needs to be understood by the jock as well as by the mechanic. First, let's talk about the throttles. One is in the cockpit and the other is in the unified fuel control. The latter is labeled "Power Lever Angle Prime" or PLAP for short. PLAP is the boss throttle! That's the one the engine responds to. PLAP moves at a controlled rate--even if you slam the cockpit throttle to the stops. And if you do slam the throttle to max augmentor, PLAP will stop at military power until the engine is ready for augmentor, and then start moving again to match the cockpit throttle position. But here's one of the problems: PLAP isn't smart enough to detect an augmentor blow-out, it just keeps moving ahead as if nothing ever happened. So you need to be alert for blow outs and reverse PLAP by pulling the cockpit throttle back. Now, we've got

a fix coming to give us a "smarter" PLAP (it's already in the F-16 engines). The fix is called "PLAP Retard," and basically it returns PLAP to minimum augmentor whenever a fan stall occurs in augmentor range, even if the cockpit throttle is in max augmentor. This will help us a lot.

Now let's discuss the two fuel controls, the unified fuel control (UFC) and the engine electronic control (EEC). The UFC is a hydromechanical system, which means plumbing and valves. And that in turn means that it simply isn't capable of the fine-tuning this engine requires at mil power and above. So the engineers added a "vernier control" or EEC. It's basically a solid-state computer that's programmed with F-100 operating logic and limits. At mil power and above, the EEC compares actual engine operating parameters with its logic. If a variance in parameters is detected, the EEC will adjust (trim) the UFC to maintain optimum engine operation, and prep the engine for augmentor. The adjustments are made through three stepper motors in the UFC--mach number, exhaust nozzle and PLAP. The EEC also has a



feed-back loop to check up on its adjustments. If the feed-back signals are incorrect, the EEC reverts to a degraded mode and illuminates the cockpit warning light. Cycling the cockpit EEC switch may restore normal operation of the EEC if the fault no longer exists. (If the light stays on, you're stuck with a mil-power engine).

Now let's put all this together and see what happens when the pilot slams the throttle from idle to max augmentor:

- PLAP advances at a fixed rate to military power and stops.
- The EEC checks the engine and trims the UFC as necessary.
- When the **minimum** parameters for augmentor operation are satisfied PLAP is allowed to advance to match the cockpit throttle position. The key word in the sequence is "minimum." The pilot can get a much better engine trim from the EEC if he stops the cockpit throttle at military, waits until nozzle movement

settles down (indicating the EEC has trimmed out the engine) and then selects augmentor. (An example of TLC for our "youngster." Now, let's discuss the five segments of augmentor. The augmentor has hot air coming from the turbine exhaust and cold air from the fan ducts.

Segment 1, minimum augmentor, operates on low pressure fuel and hot turbine air to produce an easy, soft light. Segments 2 and 3 are located in the mixed air stream, a bit harder to light. Segment 4 is near the center of the augmentor, therefore sees only "hot" air. However, the segment has a large step-increase in fuel flow (due to three spray rings vs. one in the other segments) so it has some problems all of its own. Segment 5 is at the outer circumference and sees only cold air, which is difficult to light (and difficult to keep lit). "Rumble and blowout" are usually associated with Segment 5 operation. The point of all this discussion about the augmentor is getting the best operation out of your F100 engine and that comes from stopping in Segment 1 to enable the flame pattern to stabilize (let it act as a "pilot light"). Then you can advance through the remaining segments. By watching the exhaust nozzle indications you can "see" each segment light; or you can feel a little boost or "bump," as each ignites. If one segment blows out, it's time to retard the cockpit throttle to **mil**--not min AB--and not below mil. There are a couple of reasons for this. First, remember the EEC "does its thing" at mil power, so we need to give it a chance to readjust the parameters that might have caused the blowout. And second, we need a few seconds in mil to reset the augmentor igniter.



Now let's sum up the article: The F100 hasn't been around long enough to get all the growing pains worked out...we can't take it for granted. As you get higher and slower you're presenting a tougher problem for the augmentor. You can improve your chances for stable engine performance if you (1) **anticipate** the need for augmentor by moving the throttle to military, (2) **wait** (or watch, if you can afford a peak at the nozzles) for the EEC to trim the engine, and (3) **stabilize** in min augmentor before asking for max thrust.

Good hunting! ➤

chock talk

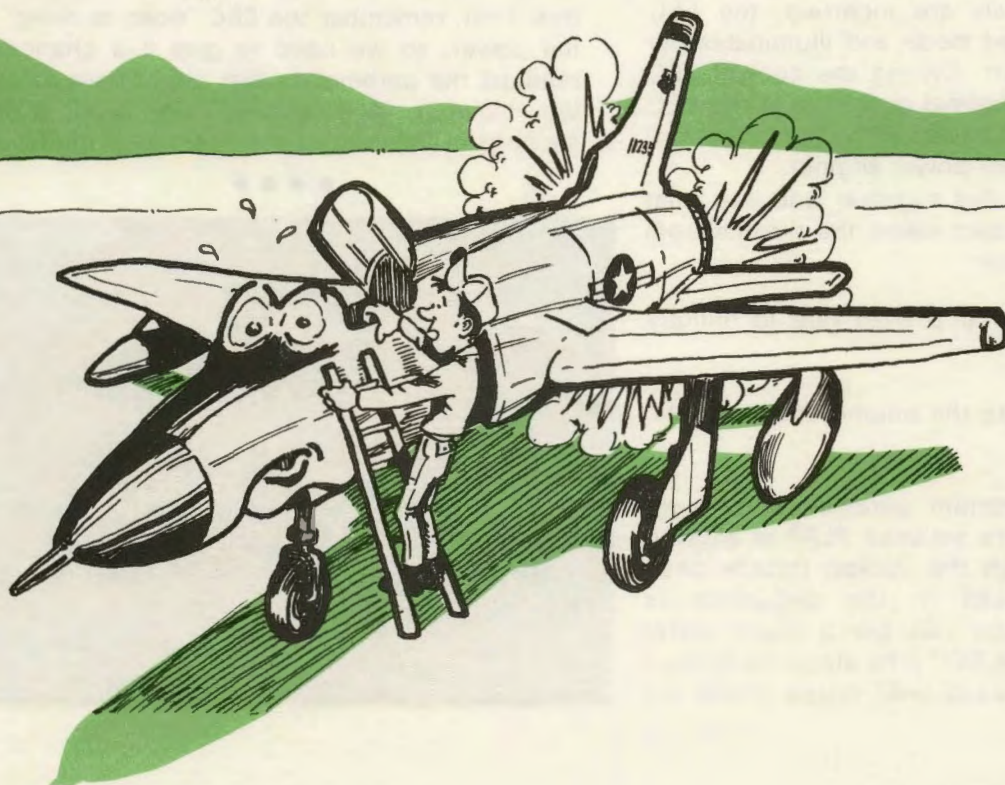
*...incidents and incidentals
with a maintenance slant.*

LOOK OUT BELOW. . .

The F-105 was scheduled for an engine run. The engine specialists arrived at the aircraft about 0115. The supervisor proceeded with the ground checks while the other specialist went to the cockpit. He stood on the ladder, set his checklist on the seat and using a flashlight, started the pre-run checklist. When he reached over and turned on the battery switch to check the fire loops, he heard a loud bang. He turned the battery switch off and exited the cockpit. When he reached the ground, his supervisor told him that the explosive bolt in the tailhook had just fired. The safety device for the hook was installed and prevented the hook from falling.

It's suspected that the specialist inadvertently hit the arresting gear release (AGR) switch at the same time he turned on the battery. The hook release is not connected through the battery switch but has its own circuitry which checked out O K. The AGR switch guard was missing which made it a lot easier to trip the switch unknowingly.

Most important of all, standing on the cockpit ladder is probably not the best position from which to check cockpit switches. Besides the awkward position, making it easier to miss a switch, the chances of falling in the cockpit or off the ladder are excellent. When you have to check the cockpit switches, it's best to sit in the seat to do so. After all, you're earned a few seconds of sitting down now and then, haven't you?



BEATEN EAGLE

We found another instance where a lot of people had a chance to prevent an incident and didn't...

The F-15 was being prepared for a ferry flight. During his inspection of the aircraft, prior to the arrival of the pilot, the crew chief failed to remove the secondary heat exchange cover. The pilot also failed to notice the cover was still on the aircraft when he did his preflight---the quick check crew never noticed the cover either.

During or after takeoff, the cover was blown back into the right vertical stabilizer and remained there throughout the flight. The cover, as well as the hole it had beaten in the stabilizer, were discovered on BPO at the destination station.

The price of a few moments inattention ?---\$2700.00

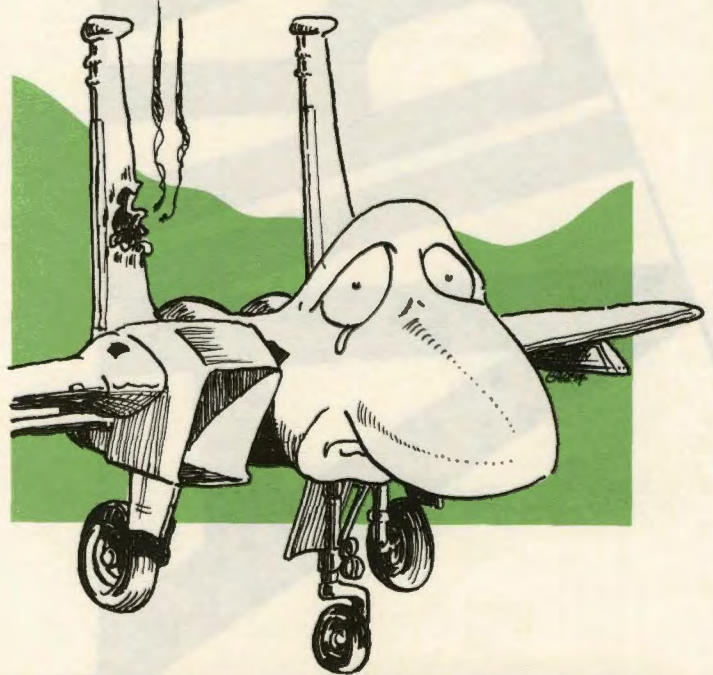


\$15,000 SAFETY PIN

The "Let's hurry up and get the job done," maneuver caught some folks again. A few days ago, an F-4E was going through the end-of-runway check prior to a ground attack mission. The functions of inspecting and arming the aircraft were being conducted simultaneously in order to reduce the time required. The safety man/observer (aircraft specialist) was plugged into the aircraft while the remaining specialist and two munitions personnel went about their duties. The observer took it upon himself to arm the nose gun. (Can you see it coming? Yep, this one's easy.)

He got the gun armed and closed; but as he was bringing the gun safety pin to the munitions crew, one each J-79 sucked it right out of his hand. The engine received damage to all 17 stages of the compressor.

There's nothing wrong with conducting the checks and arming simultaneously, but personnel shouldn't attempt to perform tasks they haven't been trained or certified to perform. In cases like this, when something goes wrong, it really goes wrong.



An ORI is a situation in which you stop doing what you were doing in order to simulate doing what you were doing so that you can show someone else that you can simulate doing what you were doing as well as you were doing it when you were just doing it.

Courtesy SSgt William Heaphy
727 DOTD, Bergstrom AFB

PROFILES

Airfield Profiles

LUKE AFB "FIGHTER COUNTRY"

Hello from "Fighter Country". We have just completed one of the wettest years on record and the desert will be blooming soon. If you're planning a trip to Luke, a few words on the local area/problems should prove helpful.

Luke is located approximately 15 miles west of Phoenix. The area immediately surrounding

the airfield is mostly farmland with scattered, variable broken residential areas (SEE MAP). Arriving and departing traffic at Luke can expect directions to avoid overflight of Sun City (approximately 5 miles northeast, on the extension of runway centerline). The published TACAN to runway 21 takes you over Sun City and is only for use in IMC conditions. Please, don't fly over Sun City in VMC.

At present, no flight path changes have been made with respect to "Sun City - West", a new development now under construction. The other communities around Luke are not under the flight paths and Phoenix Approach will keep you well clear of them.

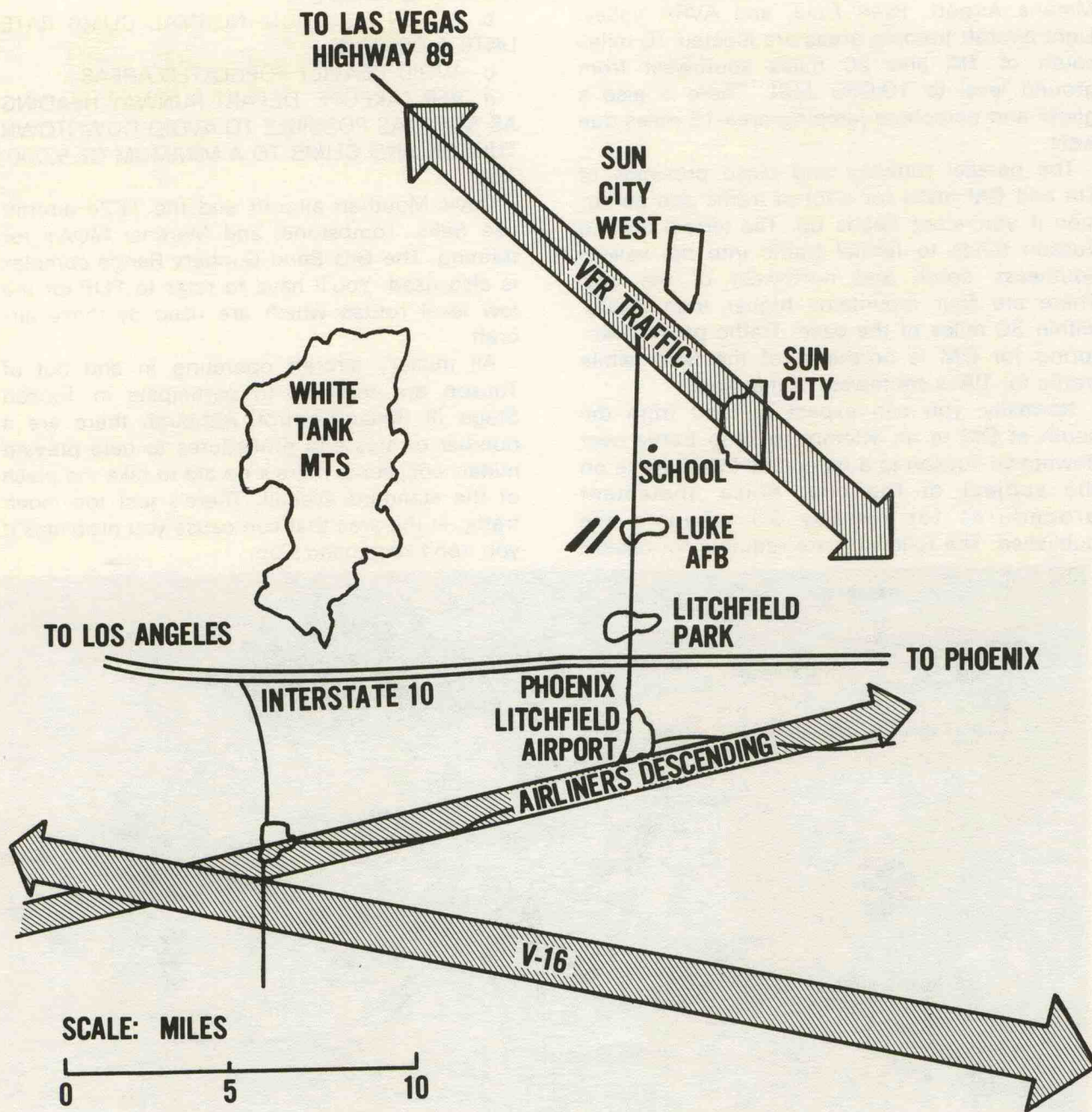
Luke Traffic pattern altitude for jet aircraft is 3000 MSL. Descend to 2600 MSL when on 3-mile initial for overhead patterns. All pitchouts are to the west. Six miles west of Luke the White Tank Mountains rise up to 4100 feet and will swat the ill-prepared flier. Minimum vectoring altitude over the White Tanks is 5200 MSL. The published TACAN to runway 03 will take you around the west side of the White Tank Mountains, so maneuvering on the TACAN approach in IMC requires precision.

Traffic density in the Luke area is moderate. Our near miss experience has identified two areas where you are most likely to meet conflicting traffic (SEE MAP). Highway 89, north of Luke, is a favorite of Phoenix area pilots flying VFR to and from Las Vegas. These aircraft will most likely be at a VFR hemispheric altitude and will not be in radar or radio contact with an ATC agency. For this reason, the potential for a close encounter is greatest in that area. South of Luke, density is a little higher; however, aircraft in this area are more likely to be under ATC control (Phoenix Litchfield Airport traffic pattern, airliners descending to Sky Harbor, aircraft on V-16).

When you come into Luke, drop by the Safety Office (we're right across from base ops) and say "hi". We're always ready to field questions or try to solve any problems you may have.

Hope you have a good trip. See you in "Fighter Country".

LUKE AFB AREA



DAVIS-MONTHAN AFB, AZ and Tucson International, AZ

Davis-Monthan AFB is located on the Southeast side of Tucson. In addition to A-10

student training, the base supports a squadron of O-2s and is also the home for the Military Aircraft Storage and Disposition Center (MASDC), more commonly known as the "Boneyard." Tucson is a high density traffic area with all types of aircraft. Tucson International (TIA) is located 4.5 miles Southwest of DM and is the home of the 162d TFG (ANG) which flies the A-7.

airfield profiles

Additionally, there is a lot of commercial and general aviation traffic operating from TIA. General aviation traffic also operates from Marana Airport, Ryan Field, and AVRA Valley. Light aircraft training areas are located 10 miles south of TIA and 20 miles southwest from ground level to 10,000' MSL. There is also a glider and parachute jumping area 15 miles due west.

The parallel runways and close proximity of TIA and DM make for a lot of traffic and confusion if you're not heads up. The terrain around Tucson tends to funnel traffic into the valleys southeast, south and northwest of the city. There are four mountains higher than 8,000' within 30 miles of the base. Traffic pattern vectoring for DM is northeast of the field, while traffic for TIA is southwest of that field.

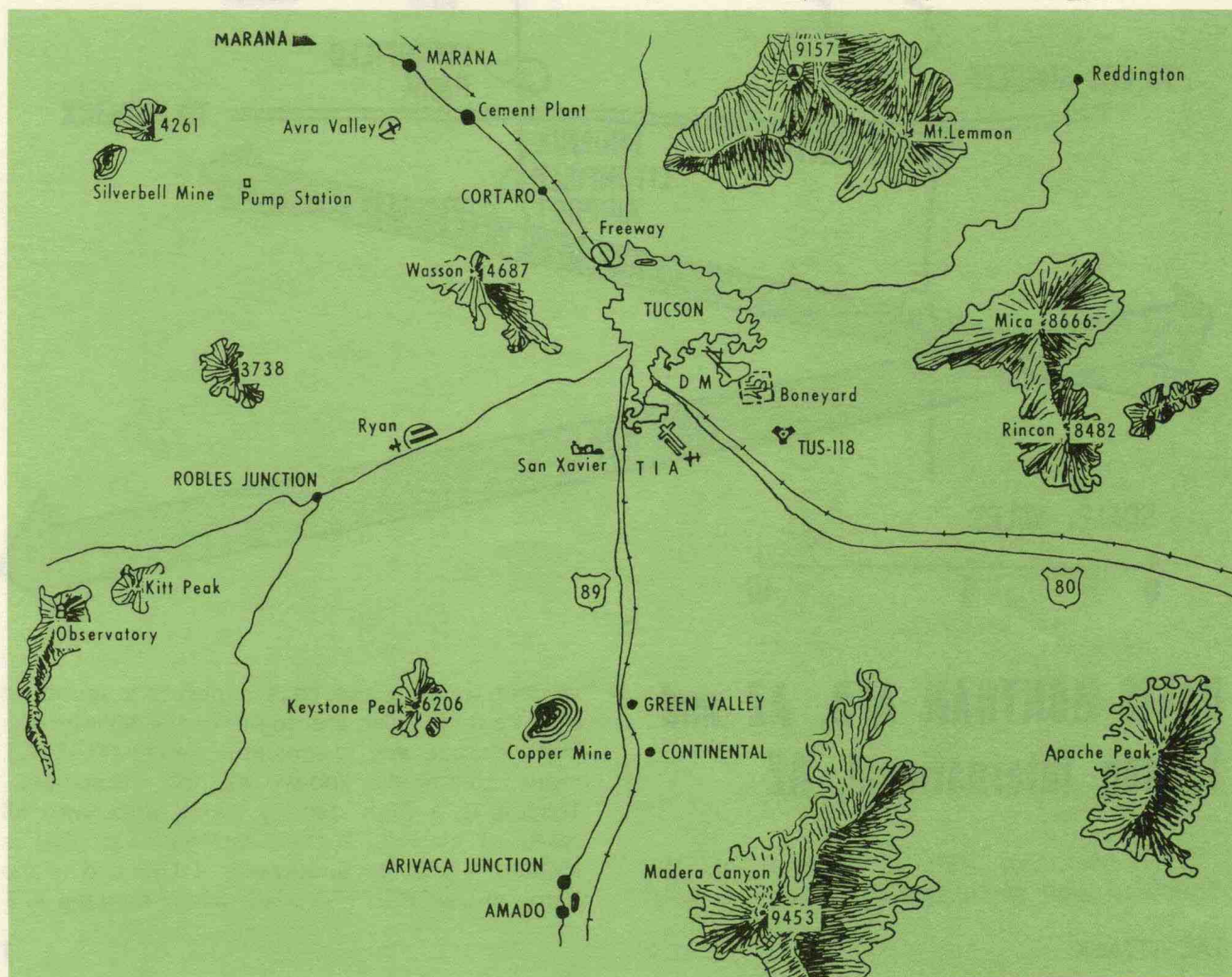
Normally, you can expect to land from the south at DM in an attempt to keep traffic over downtown Tucson to a minimum. While we're on the subject of the city, noise abatement procedures for runway 30 takeoffs are published. The following are required for takeoff

from RW 30:

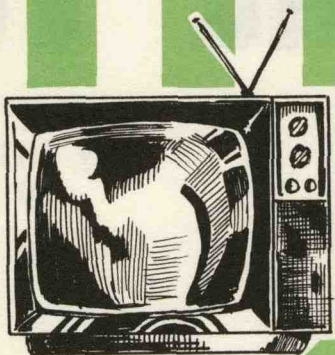
- TERMINATE AFTERBURNER CROSSING FIELD BOUNDARY.
- ATTAIN MAXIMUM NORMAL CLIMB RATE UNTIL 5,000' AGL.
- AVOID HEAVILY POPULATED AREAS.
- VFR TAKEOFF: DEPART RUNWAY HEADING AS SOON AS POSSIBLE TO AVOID DOWNTOWN TUCSON AND CLIMB TO A MINIMUM OF 5,000' AGL.

Davis-Monthan aircraft and the 162d aircraft use Sells, Tombstone, and Morenci MOA's for training. The Gila Bend Gunnery Range complex is also used. You'll have to refer to FLIP for the low level routes which are used by these aircraft.

All military aircraft operating in and out of Tucson are required to participate in Tucson Stage III Radar Control. Although there are a number of aids and procedures to help prevent midair collisions, there's no aid to take the place of the standard eyeball. There's just too much traffic in the area that can cause you problems if you don't keep head's up.



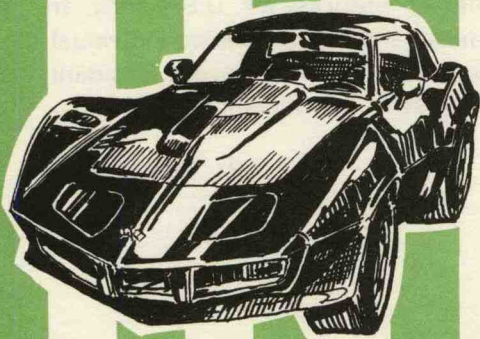
TAC's 1978 FOD losses exceeded \$2,200,000. In this era of millions and billions that probably doesn't sound like much---let's look at it another way. That same amount of money would buy....



7,333 COLOR TV SETS



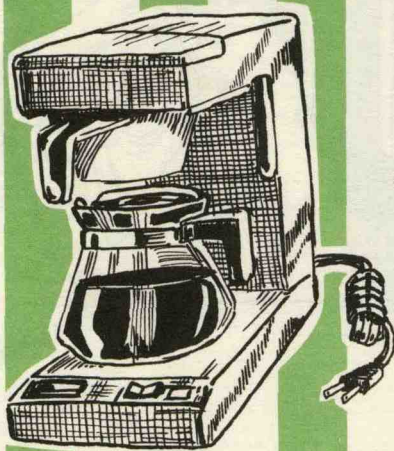
2,200 MOTORCYCLES



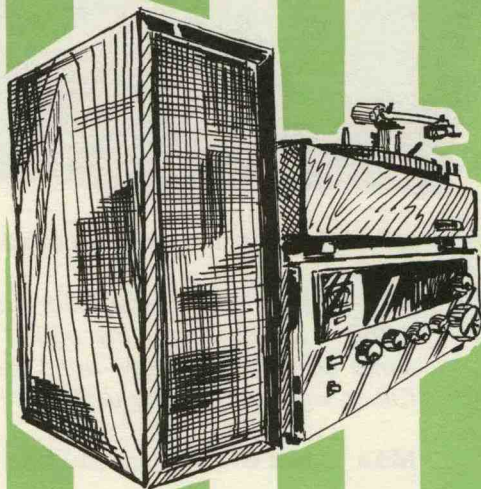
110 SPORTS CARS



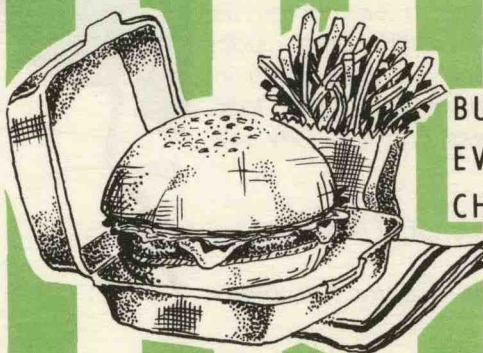
733,300 WOMEN'S
DRESSES @ \$30



ENOUGH COFFEE MAKERS
FOR EVERY MILITARY &
CIVILIAN MEMBER OF TAC



8,000 STEREOS



BURGERS & FRIES FOR
EVERY MAN, WOMAN &
CHILD IN HOUSTON, TX

“THE TRAVELS

By SMSgt Michael Veda
HQ TAC/LGMS



I recently had the opportunity to interview Mr. U.S. Penny, an internationally known, well liked, and much traveled individual. Mr. Penny is presently convalescing from a recent accident and graciously consented to answer my questions.

Mr. Mike Malice

Mike "Where and when were you born?"

Mr. Penny "I was stamped out in Denver in 1955. I guess I told my age! I was about the same size then as now, but I was shiny, bright, full of vigor, and ready to travel."

Mike "Just where have you been?"

Mr. Penny "I left home real quick. I was bundled up and packed with lots of my brothers and sisters and soon found myself in 'circulation' as they say. I guess I have been everywhere - kids' piggy banks, in collections - I've even been in churches of all denominations! I've been lost, found, saved, spent. I guess you can say I've seen about everything!"

Mike "Sounds like you had a lot of fun."

Mr. Penny "I sure did, until recently; but things happen like that."



OF MR. PENNY”

Mike “Would you like to tell us what happened?”

Mr. Penny “OK, I’ve pretty much recovered from the shock and got myself together, in a manner of speaking. Anyway, one day I found myself on Pretty Patch Air Force Base, and soon I belonged to a Sergeant Go Getter. The sergeant was a fine person and told his friends I was his lucky penny, so I was held onto pretty tightly. The sergeant worked real hard and did a good job, from what I heard.

“Early one morning the sergeant had to look in a whole bunch of airplane intakes. He always took me and other stuff from his pockets, put on a big white suit, got a bright light, and climbed into that funny hole. After awhile he would come back out and put writing in some kind of book everyone would look at. The sergeant was always careful to pick everything up and put us away. The day it happened, the tool place didn’t have any big white suits; and the bright light wouldn’t shine. Sgt Getter didn’t want to do any looking without those things, but another person with a lot of stripes said, ‘Go ahead, just clean your pockets out.’ So the sergeant did; but since I’m so small, I got missed. With all that sliding and twisting that was done, I slipped out of the pocket and into a crack. I think they call it a bell-mouth seal or something. The sergeant looked very hard with the dim light, but didn’t see me. Actually, I wasn’t missed when the sergeant picked up all the other stuff. I was a little lonely, but not afraid. I had been lost before, you know. All of a sudden I heard this whirring, whining noise, and air rushed past me. Pretty soon the noise got much louder, and suddenly my hiding place got very big and I was sucked into the thing that was making all that noise! It was awful! I’d been mistreated before, but this was terrible! I was slung, flung, battered, bashed and beaten up! Of course, I was doing some beating up

myself. Soon it all stopped, and later on I was picked out of that now quiet thing. People with blue suits and birds on their coats came to look at me and say, “That did this?” Other people with green clothes and lots of stripes just looked and shook their heads sadly. Somebody said I had cost 9,484 DOLLARS! I thought that was ridiculous, but I wasn’t in any shape to argue about it. Anyway, I was soon forgotten because one of my big cousins, Mr. Quarter, had the same thing happen to him, and he cost a lot more.”

Mike “What are your future plans?”

Mr. Penny “Well, I’m finished with my past life. You can hardly recognize me now. One of the people in a blue suit said I should be placed on something called a Foreign Object Damage Display Board to remind people like Sergeant Getter to be careful and always go by the book.”

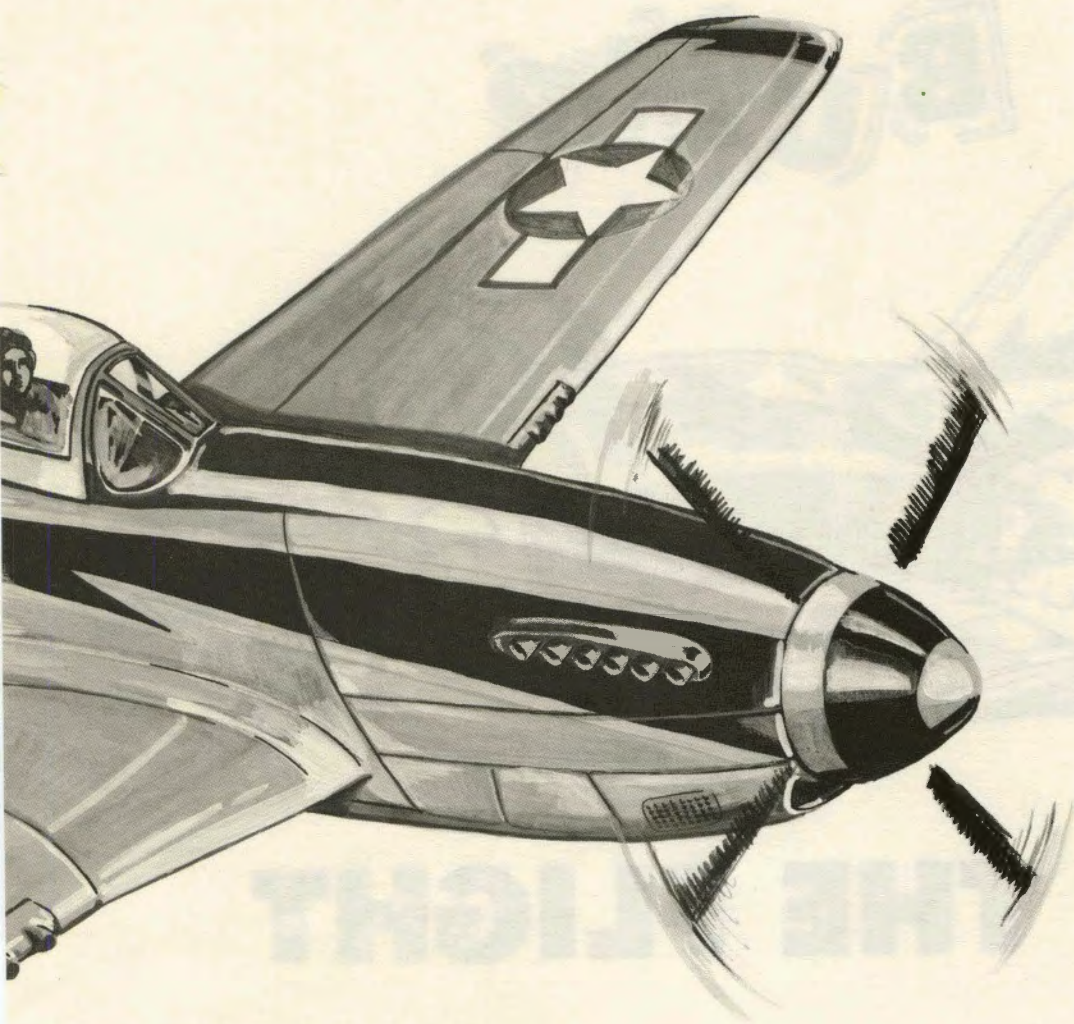
Mike “Thank you, Mr. Penny.”

Mr. Penny “That’s OK. Come by anytime. I’ll be here.”



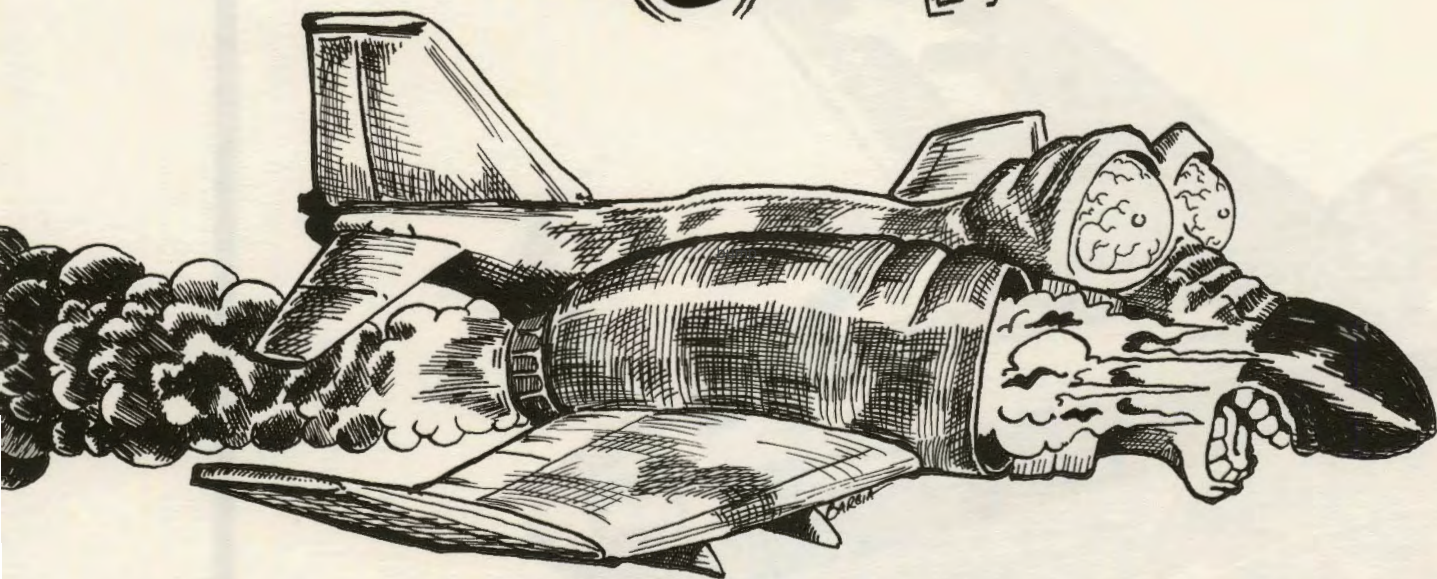
P-51 Mustang





THINGS THAT GO

BUMP



IN THE FLIGHT

By Capt Pete Abler
Editor

How long have you F-4 LES drivers been complaining about the need for re-examination of the engine operating envelope because of an increasing number of undetermined/cannot duplicate engine compressor stalls and flameouts? Well, the Air Force Flight Test Center (AFFTC) at Edwards AFB has conducted a limited flight test evaluation. Testing was concentrated in the 15,000 to 30,000' altitude, low airspeed (150 kts and above) region at angles of attack up to and beyond 30 degrees. Here's a brief synopsis of the two phases of testing:

PHASE I---involved four types of test maneuvers from straight and level flight to high AOA/maximum rudder maneuvers. Both stabilized military power settings and a series of throttle bursts were used. The basic flight maneuvers performed were "over-the-top" or "underneath" ACM-type maneuvers and involved full-rudder deflection leading into a rapidly descending, nose-down rolling maneuver at high AOA, sideslip and pitch change. Stalls and flameouts in this severe maneuvering could be induced by the throttle bursts (only when the

....OR WHERE DO ALL THOSE COMPRESSOR STALLS COME FROM ANYWAY?

throttle was advanced into afterburner---no stalls occurred when the throttles were retarded).

PHASE II---was a continuation of phase I and simply included adjustments to Main Fuel Control, A/B fuel controls, CADC Bellmouth Controller CAM settings and engine swaps. This second phase was designed to see if engine performance could be improved at different settings.

RESULTS

Not surprisingly, it was found that no stalls or flameouts occurred at fixed throttle (mil power) settings. Stalls and flameouts occurred above 25,000' at low yaw rates at or above 24 units AOA. Stalls at high yaw rates were noted at 15,000' above 22 units AOA, and flameouts occurred above 25,000' under the same conditions. Engine fuel control settings obviously had some effects on operation but were not conclusive relating to stall/flameout. Maintenance changes are not anticipated.

CONCLUSIONS

Although the tests were limited, they did serve to further validate the published engine envelope. The envelope does not guarantee the absence of compressor stalls/flameouts since they are caused by a number of other factors. The two major factors which use up available stall margin were once more confirmed in this test. They are inlet distortion resulting from ACM-type maneuvers and throttle bursts--especially throttle bursts into afterburner.

The study resulted in several other findings which may lead to some additions to the F-4 Dash One. Cockpit AOA lags true AOA by a significant amount during heavy maneuvering. Therefore, these two caution notes were proposed for inclusion in the Dash One:

CAUTION

When maneuvering at high AOA (25-30 units), large rudder inputs to effect rolls will cause excursions in AOA of up to 10 units if the control

stick is not moved forward as rudder is applied. This sudden increase in AOA could cause the pilot to fly the aircraft well in excess of 30 units AOA during high AOA maneuvering.

CAUTION

The cockpit AOA indicator may lag true aircraft AOA by as much as eight units during a high rate maneuver. Caution should be exercised during rapid maneuvering at high angles of attack to avoid inadvertently exceeding aircraft angle of attack limitations.

The following change may also appear:

The USAF F-4E Flight Manual (TO 1F-4E-1) contains the following note on page 6-16:

WARNING

Operation above 30 units AOA at altitudes above 28,000 feet may result in engine flameout(s). Above 30,000 feet, this critical AOA is reduced approximately 1 unit per 3,000 feet (e.g. 29 units AOA at 33,000 feet).

The following will be added to the above note.

In some F-4E Aircraft, stalls or flameouts can occur at angles of attack as low as 22 units AOA, especially at high yaw rate, with dynamic throttle. These stalls/flameouts can be avoided by not advancing the throttle while above 22 units AOA.

Stalls and flameouts are not limited to the F-4 slatted E model aircraft. Every jet engine installed in a fighter aircraft is subject to stall and flameout under conditions of heavy maneuvering and throttle bursting. The J-79 installed in the F-4 has been one of the best fighter engines in recent years and will continue to be as long as the operators understand what makes it operate and where they can get in trouble if they abuse it.

If possible, maneuver at a stabilized power setting. If you don't, you're risking a stall and that bogey at 12 o'clock could shortly end up at your six while you try a restart...think about it. ➤

TAC TIPS

Never throw mud. You may miss your mark;
but you must dirty your hands.

Joseph Parker

HOW LOW CAN YOU GO ?

Most of the pilots and instructors who regularly fly the F-15B are aware of the problems and cautions associated with flying in the rear cockpit. But for you who get to demonstrate the F-15 to visiting newsmen and VIPs, or those who haven't given much thought to the differences between cockpits---here is a potential hazard worth considering. When do you need to lower the seat and how low do you go.

There is no exact answer, but whenever you're going to exceed Mach 1, you want the seat as low as you can handle it. Why? It's just a safety precaution for the possibility of inadvertent canopy loss. The F-15 seats were designed to give you the maximum outside visibility---but you're seated very high compared to the rest of the fuselage. The rear seat does not have the same windblast protection as the front. Flight testing has demonstrated that airspeeds up to 415 KCAS can be fairly well tolerated by the back seat occupant. Above that speed, you're going to have some problems. (The flight tests and a subsequent inadvertent canopy loss at .9 mach are covered in MACAIR Product Support Digest---issues 5 & 6 of Vol 24, 1977)

Whenever you receive your first backseat ride, be sure to lower your seat for those moments of high speed and supersonic flight. Here's hoping you never fly a Bald Eagle.

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

ACES HIGH

The F-15 community is transitioning to ACES II ejection seat aircraft quite smoothly. The ACES II ejection seat and its advanced capabilities should save many lives throughout the system's life cycle. For those of you who are just getting acquainted with the new seat, we have a couple of pointers...

First, you'll notice the parachute riser fittings on an ACES II are more bulky than those on your IC-7 seat. Because of their design they will not match up as well with your torso harness. This presents no problems for normal use or during ejection. However, there is the possibility that the fittings may get hung up or snagged during a rapid manual ground egress. So, if you plan on manually disconnecting, rather than using the "Rapid Escape Divestment System" to ballistically activate the quick release disconnects, then be aware that you may experience a momentary parachute riser hand-up. The hang-up will be cleared as soon as the fittings are lined up to permit a straight line disengagement (vs a cocked disengagement where the grooves on the male fitting can hang up on the female harness fitting).

Secondly, the old familiar "head knocker" in the IC-7 is no longer with us. In its place, ACES II has an ejection control safing lever located on the left side of the seat bucket. This lever mechanically prevents activation of the side mounted ejection controls. The old habit patterns which relied on the head knocker to remind you to arm the seat prior to takeoff will not work with the ACES II. So, when you transition to the ACES II seat, be sure to examine your habit patterns---change them if necessary to insure the seat is ready to go should you ever need it.

LET'S GIVE IT ONE MORE TRY

Now everyone knows that the F-15 is having a few problems with the engines. Some people seem to be going out of their way to make the problems worse. Case in point. . .

The Eagle driver was on an ACT mission. He experienced two separate augmentor blowouts at augmentor initiation---FL 310 and .9M. (The engine must have been trying to tell him something) He did however, get a good light at FL 400 and .9M a bit later in the mission. He proceeded with an engagement and during the maneuvering, the engine stagnated. The pilot shut it down, restarted the engine, and RTB'd.

What happened was an electrical malfunction of the compressor inlet variable vane (CIVV) actuator stepper motor imposed an excessive electrical load on the engine electronic control (EEC) inducing failure. The engine finally cried uncle. The point is, if it isn't working right, bring the aircraft home and let the maintenance troops fix the bird. Just because engine stagnations are somewhat commonplace, doesn't mean you have to go out of your way to have one of your own. . . .

HYPOXIA...AT 7,000 FEET ?

The photo phantom was motoring along at 7,000' MSL when the pilot experienced what he was sure were hypoxia symptoms. He went to 100% but felt that made his symptoms worse. After relinquishing control of the aircraft, he removed his oxygen mask and dumped cabin pressure. He began to feel better within a few moments, took control of the aircraft, and landed---even though mild symptoms continued until after landing.

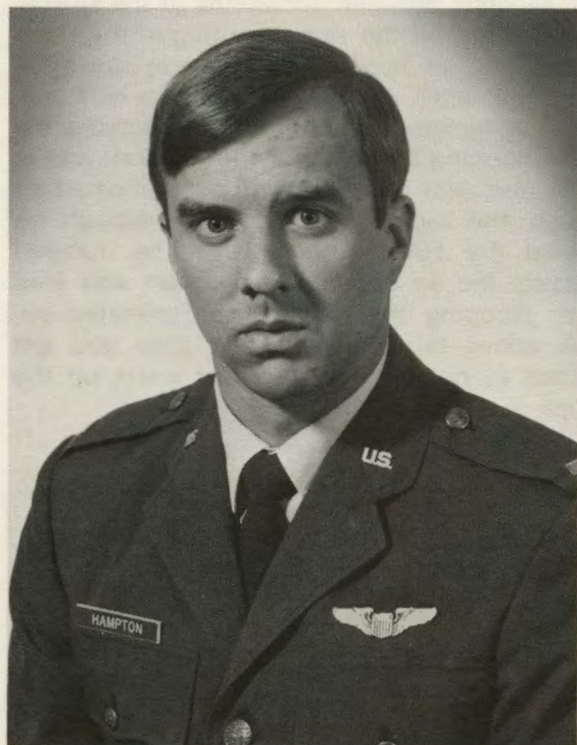
The maintenance investigation revealed two things: a bad oxygen regulator, and a damaged moisture separator coalescer. (No, I don't know what that is either) The moisture separator had been damaged by excessive temperatures in the air conditioning system. The excessive temperatures were most likely caused by improper use of the manual air conditioning temperature control. Maintenance tech orders have a warning not to hold the switch in the hot position longer

than 1/2 second and to pause for a minimum of three seconds between actuations of the switch. Now try and find the same warning in the Dash 1---don't try to hard though, 'cause you'll be straining yourself unnecessarily---there isn't one.

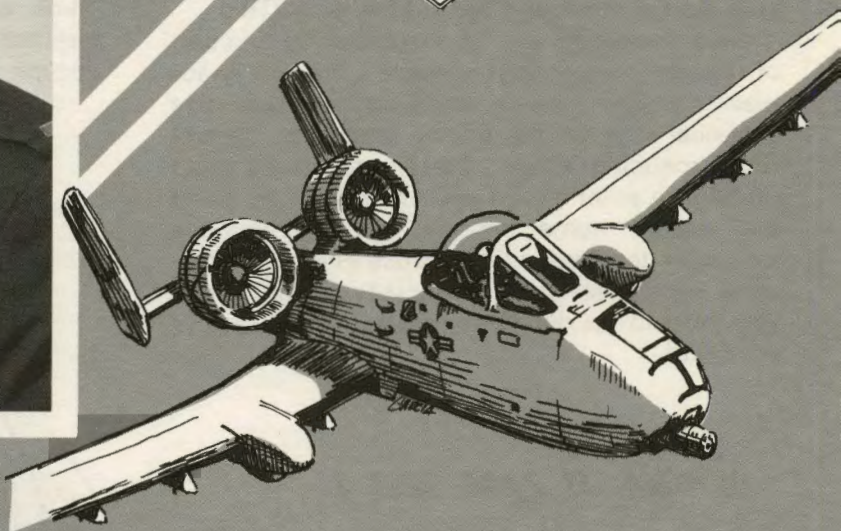
So, the moisture separator contaminated the air conditioning system. Since the aircraft was at 7,000', the pilot was breathing contaminated air through the faulty regulator even though he selected the 100% setting. When he dumped pressure, the air conditioning system was shut down, stopping the flow of contaminated air. Think about this one the next time you get tempted to hold that switch and warm up the cockpit in a hurry.



AIRCREW OF DISTINCTION



1st Lieutenant Coleman Hampton
354th TFW
Myrtle Beach AFB, SC



On 5 October 1978, 1st Lt Coleman Hampton was flying a mission in an A-10 participating in Joint Air Attack Team training with Cobra helicopters at Ft Knox, Kentucky. During ingress at 100' AGL, he made a simulated strafe attack on a target. After jinking off the target into a narrow, upward-sloping valley, Lt Hampton noted that the stick would barely move in pitch. He managed to establish a shallow climb and cleared the trees in the valley.

At 5000' AGL, he performed a controllability check which indicated limited pitch control available down to 130 kts. As he raised the landing gear following the controllability check, the stick froze with the aircraft in a shallow descent. Lt Hampton switched to manual reversion, slowed the aircraft and using both hands, arrested the descent. With the aircraft recovered,

he reengaged normal flight controls and flew 125 miles to Ft Campbell where a longer runway was available.

Approaching Ft Campbell, he executed another controllability check before attempting to land. As he lowered the gear, the nose of the A-10 dropped once more into a moderate descent. As one last-ditch step before ejection, Lt Hampton braced himself on the rudders and exerted maximum force on the stick, breaking it free. He was then able to complete a normal approach and landing at Ft Campbell.

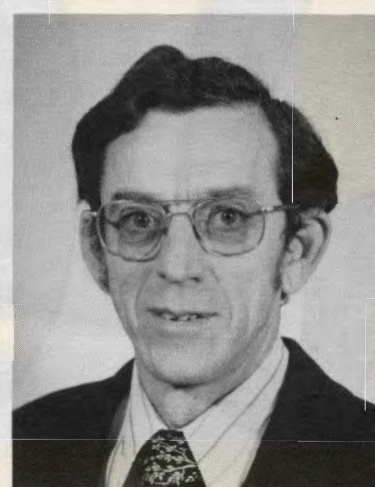
Investigation revealed that a wrench had lodged in the control cable area of the aircraft. Lt Hampton's calm and timely actions prevented a more serious mishap and saved a valuable fighter aircraft. His exemplary performance qualifies him as the TAC Aircrew of Distinction. ➤



TAC SAFETY AWARDS

Ground Safety Award of the Quarter

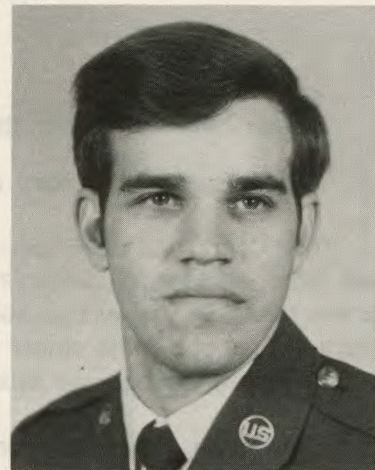
Mr. Alexander Atkins, Plant Manager, USAF Regional Hospital Shaw, Shaw Air Force Base, South Carolina, is the winner of the Quarterly Ground Safety Award for 4th Quarter 1978. Mr. Atkins has planned and implemented an outstanding unit safety program, which included a safety inspection checklist combining USAF and National Fire and Hospital Codes. His program received favorable comments from the TAC IG and Medical IG teams.



Mr. Alexander Atkins

Crew Chief Safety Award

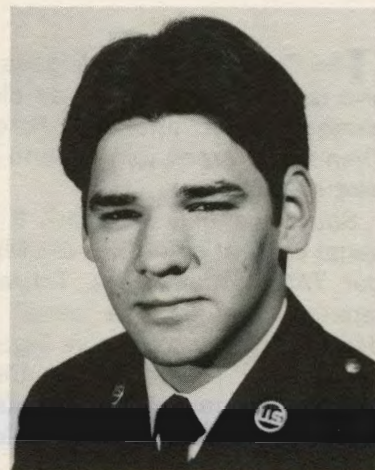
Staff Sergeant John H. Tietjen, 1st Equipment Maintenance Squadron, Langley AFB, Virginia, is the winner of the Crew Chief Safety Award for March 1979. Sergeant Tietjen's T-39 aircraft has become the most airworthy and dependable aircraft maintained by his unit. Additionally, Sergeant Tietjen's dedicated troubleshooting led to the discovery of a cracked main fuel line elbow. He continued to pursue the investigation of the problem long after other personnel would have stopped. His safety-consciousness may have prevented an inflight engine fire with possible catastrophic results.



SSgt John H. Tietjen

Individual Safety Award

Airman First Class David J. Wentworth, 355th Aircraft Generation Squadron, Davis-Monthan AFB, Arizona, is the winner of the Individual Safety Award for March 1979. In November 1978, Airman Wentworth was standing fire guard for an A-7 engine run on the trim pad. Just as the engine was started, Airman Wentworth noticed that the hot exhaust from the aircraft starter had ignited some tar in the joints between sections of concrete. The fire quickly spread and produced sizable flames directly below the empennage. Airman Wentworth notified the crew chief to shutdown the aircraft and quickly extinguished the flames. Airman Wentworth's rapid, correct response prevented damage to the aircraft and possible injury to himself and other personnel.



A1C David J. Wentworth

J-CATCH

By Captain Joe Vallimont
20th SOS

Photographs
By SRA Donald J. Kiley

"White Two has bandits, three O'Clock...all yours, Green!"

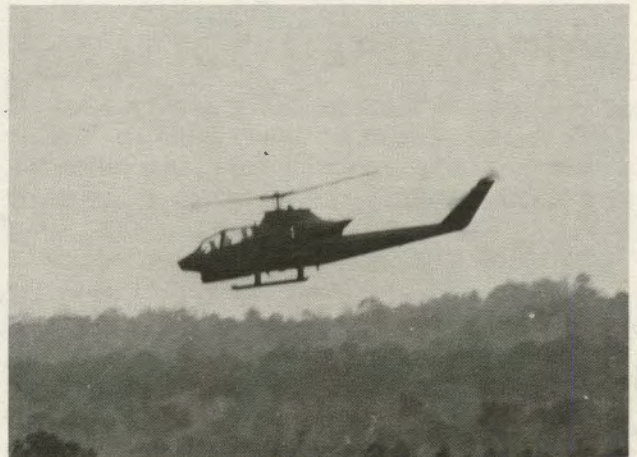
"Green Lead, tally. Cobra in the trees...engaging with cannon. He's on the move now!"

The Cobra and his Scout realize they have been spotted. They attempt to seek cover in a stream bed. Gold Element, on Green's left, picks up the bandit call and completes a delayed 90 degree turn to the right, ending up line abreast to support Green Element. The strategy works. The Cobra and Scout are caught in the pincer as they come to the end of the stream bed and are confronted with a low ridge. Climbing over this low ridge will "skyline" them, however briefly. It's too late for the Scout.

"Gold Two, firing cannon on the Scout 200 meters east of the Cobra. Got him!"

The "knock it off" call goes out on the radio and is acknowledged by all players; Red Forces climb to orbit, and Blue Forces hold position. Then both forces join up and reposition for the next engagement.

Sound vaguely familiar? It is somewhat like aerial combat maneuver (ACM) training at any of our TAC fighter bases. There's one major difference, though: the aerial engagement just described did not involve Tiger IIs, Phantoms or Eagles, but newcomers in the air-to-air area - US Army Cobras and Scouts and TAC Green Hornets - not fighters, but helicopters!



BLUE FORCE ARMY AH-1S COBRA

JOINT COUNTERING ATTACK HELICOPTERS

The armed attack helicopter emerged recently as a new threat postulated to have great impact on a modern battlefield; the air action described above is part of a joint Army/Air Force test, development and evaluation (TD&E) program to determine the tactical problems associated with engaging this threat in battle. The program is called "J-CATCH", which stands for Joint Countering Attack Helicopters. The purpose of the J-CATCH TD&E is to explore and develop joint tactics necessary for US Forces to counter a growing attack helicopter threat from potential adversaries. Exactly how an opponent might employ its helicopter force in battle is unknown. What is known, however, is that potential adversary forces possess a great deal of strength both in numbers of helicopters and in attack helicopter firepower. Also, it's reasonable to assume that helicopter forces opposing us in future conventional battle will employ some tactics adapted from the most widely advertised, and successful US helicopter operations, i.e., air assault, armor support and special operations.

Previous studies involving helicopter aerial tactics have been fragmented and of the "quick look" variety. One of the first efforts involved the H-19 in a medivac role with Army MASH units. There was justified concern that a medivac helicopter would be easy prey for enemy fighters looking for targets of opportunity. In 1971 the Army's Combat Development Evaluation Center (CDEC) conducted a program with AH-1 Cobras against Navy F-4s. More recently, MAC's Aerospace Rescue and Recovery Service (ARRS) helicopters have become targets in exercise scenarios; many Red Flag events have included the interception of lightly armed rescue helicopters by aggressor fighter forces. The normal course of action for these helicopters was an attempt to evade the fighters. The Army began for-

mally exploring helicopter-versus-helicopter tactics and capabilities during its Air Combat Engagement (ACE) Program. The ACE Program was primarily a one-versus-one test, and it produced some unexpected results in regards to weaponry. A major fallout of ACE was recognition of a definite need for more force-on-force study. Thus, the ACE Program as well as an ARRS initiated simulator effort have been incorporated into the J-CATCH study.

The J-CATCH program began at the Langley NASA Differential Maneuvering Simulator in May 1978. Fixed and rotary wing pilots from the



RED FORCE UH-1N

"Sometimes you eat bear, and sometimes the bear eats you."

Cobra Pilot

J-CATCH joint countering attack helicopters

Army, Marines, MAC and TAC participated. This first Phase took a preliminary look at helicopters (armed and unarmed) against various fighter weapons systems.

This brings us back to the primary TAC player in J-CATCH, the Green Hornets from the 20th Special Operations Squadron, 1st Special Operations Wing at Hurlburt Field, Florida. The Squadron's primary mission is infiltration/exfiltration of unconventional warfare forces. The UH-1N and CH-3E helicopters flown by the 20 SOS are armed with 7.62mm machine guns and 2.75 in. rockets. Pilots are trained in precision low level navigation at altitudes as low as 25 feet above ground level (AGL). This, combined with the Squadron's armed helicopter escort capability, made the 20SOS Green Hornets a

natural choice as the Red Force, the J-CATCH aggressor unit.

Since January 1978, 1SOW 20SOS personnel have worked directly with the TAC Directorate of Joint Forces' Air Land Programs Office (XPJ-ALPO) and the Tactical Fighter Weapons Center (TFWC) to assemble a threat helicopter force for J-CATCH. While Squadron CH-3E and UH-1N aircraft were being configured and instrumented, aircrews began learning how to Red Force Aggressors. Intelligence sources were researched for all available information about potential adversaries' attack helicopters, particularly attack helicopter employment concepts and tactics. The result was creation of a J-CATCH Red Force that simulates as closely as possible a potential adversary's attack helicopter armor,



RED FORCE CH-3Es



Capt Joe Vallimont
is this month's
Fleagle T-shirt winner



RED FORCE ON THE MOVE. CH-3Es AND UH-1Ns.

armament, speed and tactics. The Red Force was unveiled for the first time during J-CATCH Phase II at Fort Rucker, Alabama. Six Red Force helicopters (two CH-3Es and four UH-1Ns) were employed against a Blue Force anti-armor team consisting of three AH-1S Cobras and two OH-58A Scouts from the US Army Aviation Board at Fort Rucker.

The J-CATCH project consists of six phases revolving around the three selected scenarios in

which US Forces are most likely to encounter attack helicopters.

As new as helicopter air-to-air maneuvering (HAAM) is, the role of J-CATCH Red Force (Aggressor) helicopter forces is even newer. There is a lot of "candlelight" tactics development accomplished for J-CATCH after each day's flying. The strategy and tactics used today are adjusted, revamped and incorporated into tomorrow's scenarios. The Aggressor crew is given a learning curve, just as the Blue Force learns through experience. J-CATCH Phases I, II, and III are designed for learning and development. Phases IV, is for joint Army/Air Force evaluation and refinement. The fighter world's first look at the Red Force will take place during Phase III. This phase will allow various fighter weapons systems to develop and evaluate anti-helicopter tactics and capabilities. Each system (F-4, A-7,

"...low altitude and comparatively slow speed changes the combat psychology. In this respect the pilots somewhat resemble ground troops such as tankmen, for example, who meet the enemy head-on and see his eyes. Here you see the results of your own work...."

Soviet Helicopter Instructor Pilot

J-CATCH joint countering attack helicopters

A-10, and F-15) will work against the Red Force for approximately one week. The fighters will start with an unarmed, non-maneuvering threat helicopter and progress to dealing with the entire Red Force working in the context of the scenario. All participants will be instrumented. The lessons learned by the Army in Phase II and by the Air Force in Phase III will be brought together in Phase IV of J-CATCH.

The fighter forces that participate in the various phases of J-CATCH may be in for a surprise. Fighter pilots need not look to past Red Flag experiences with scenarios of unarmed or lightly armed helicopter seeking out a simulated downed airman. The Red Force is not spring-loaded to the evade mode - they will fight back! As with any well trained, close-knit military unit, the Red Force operates with specific objectives in mind and a dogged determination to achieve those objectives. Even though tests previous to

J-CATCH were uninstrumented, there were certain underlying tones that could not be denied. One prevailing undertone from those tests was that in certain situations armed helicopters can destroy other helicopters and/or fighters. J-CATCH was designed to seek out these situations and quantify them.

The Red Force of the 20SOS is an important part of a life-sized training model for tacticians learning about attack helicopters and how to maximize Friendly Force effectiveness against them. There have already been some unforeseen developments. As in any TD&E, however, there is a working hypothesis. It is assumed that a combined effort, made up of attack helicopters, fighters and air defense can take care of the threat. Just how this combined team is to be made up, and how it will work is dependent on the effectiveness of each member. This is what J-CATCH is all about.

SKY HAZARDS

Your sharp eyes should already have identified these two aircraft. Of course, they're related. The good looking one is the Cessna Hawk XP and the other is the AF version of the basic Cessna 172, the T-41 Mescalero. These aircraft are probably some of the most popular with general aviation enthusiasts. There are a lot of them flying around.

Although the service ceiling on this type aircraft ranges from 14,000 to 17,000', you will probably encounter them below 10,000'. That narrows the airspace considerably. Add some other aircraft with similar performance capabilities such as the Piper Cherokee models, Bellanca Viking and Beechcraft, to mention a few, and the hazard rises even more. (The latter models are all low-wing aircraft)

So keep your eyes out for these, and all other aircraft. The closer you are to the ground, the denser the air traffic. One other point, these aircraft are also some of the smallest in general aviation. If you don't look for them all the time, you may find out too late that it's too late to avoid a....



Cessna Hawk XP



T-41 Mescalero

Willie & Joe

By Bill Mauldin

Good stuff is never outdated and Bill Mauldin's stuff is good. If you were lucky (?) enough to see his drawings in the "Stars and Stripes" during the big one, you'll never forget them. If you've never seen his "Willie & Joe" series before, here's your chance to see Pulitzer prize winning humor that transcends all branches of the service, all past wars and the so-called generation gap.

Our thanks to Mr. Mauldin for allowing us to run this page in TAC ATTACK.



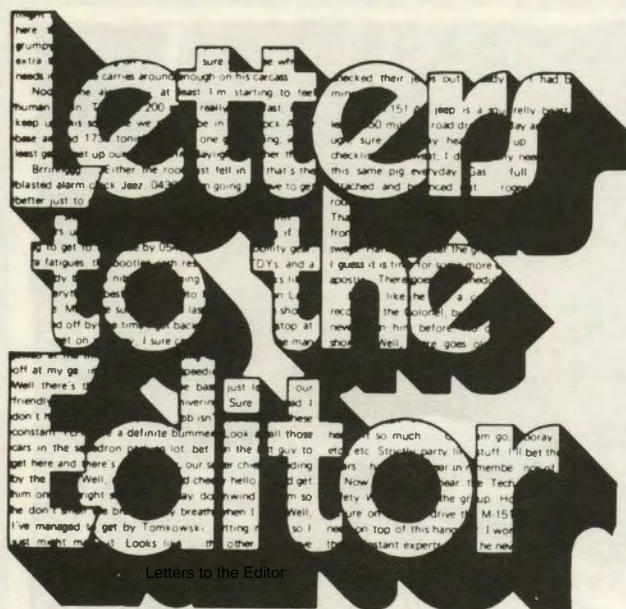
"I feel like a fugitive from th' law of averages."



"Th' krauts ain't followin' ya so good on 'Lili Marlene' tonight, Joe. Ya think maybe somethin' happened to their tenor?"



"I coulda swore a coupla krauts wuz usin' that cow fer cover, Joe. Go wake up th' cooks."



Letters to the Editor

Editor:

I am tired of reading "SOF is dumb" articles written by a non-flying, non-SOF, 2000 miles behind front lines. Prior to sabotaging supervisor's credibility, regain your flying currency, get your SOF checkout and you can reverse the bad-press trend that we dumb SOF's are generating.

No longer will "you gotta wonder what the SOF's were doing". You can bet he was not working on face time, cosmetic overtime, E.R.'s, career progression, ad infinitum, ad nauseum.

You win the I.G.'s "root-cause award" by stating the incidents "...could have been avoided had the right decision been made".

John N. Lane, Major
148 TRG Duluth ANGB, MN
Chief of Stan/Eval

Editor:

The article entitled "Divert" by Maj G. Felix in the Jan 1979, TAC Attack relays a false impression that the SOF should make the decision to divert. This is untrue. The pilot is the one to make this decision. This is not to say that the SOF shouldn't aid in such decisions, or decide, if the pilot can't/won't; however, the responsibility rests with the pilot.

In the RTU business, we strive to impress upon the young fighter pilot that he must exercise "judgement" and make decisions. Hopefully, "Divert" has

not spoiled our efforts by implying that the "old guy" in the tower will protect them from all evils.

William F. Schnittger, Major, USAF
F-4 OTD Team

It appears we have a divergence of views on the role of the SOF and his qualifications. The purpose of the SOF program is to encourage flying safety and prevent aircraft accidents. Simple enough. SOFs are an integral part of the aircraft command and control system and are tasked with taking proper actions in the interest of accident prevention, that includes holding or diverting aircraft. (That's what it says in the reg)

Now let's look at the practical side of the problem. The SOF has rapid access to air traffic control agencies, base weather, maintenance, etc. He's the one who should have the "big picture." The aircrew is flying their airplane--probably with a wingman, a problem perhaps and only one radio over which to get all the information they can. The SOF is the guy who's supposed to provide that information and guidance. The SOF is not there to make the decisions for the aircrew---unless the aircrew is unwilling to make the right decision.

It's a team effort. The SOF normally provides the information so the aircrew can make the proper decisions. The only thing that's "dumb" is when the process breaks down. It's dumb to lose an airplane because neither the aircrew nor the SOF would make a decision to divert. It's not really important at what level the decision is made---as long as it's made.

ED

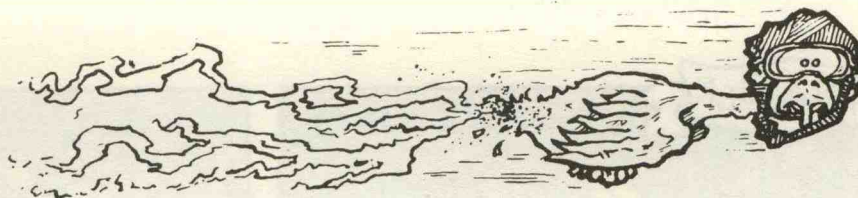
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I've received several suggestions lately concerning the pictures of our monthly safety award winners. It has been suggested that the pictures be taken in the individual's work area-- the flightline, etc., to add more realism. Although we do try to portray personnel as realistically as possible, we feel the most professional way to portray safety award recipients is in Combination 1 uniform. These photographs are normally taken in the base studio where lighting, exposure, and proportion are controlled. The printing process for TAC ATTACK requires properly exposed, high contrast black and white photographs. We feel the present system is the best method of insuring good quality photos which will portray a professional image.

ED

☆ U. S. GOVERNMENT PRINTING OFFICE: 1979-635-037/10

TAC TALLY



| | |
|----------------------|---|
| CLASS A MISHAPS | ➡ |
| AIRCREW FATALITIES | ➡ |
| TOTAL EJECTIONS | ➡ |
| SUCCESSFUL EJECTIONS | ➡ |

| TAC | | |
|-----|----------|------|
| JAN | thru JAN | |
| | 1979 | 1978 |
| | 3 | 3 |
| | 0 | 0 |
| | 3 | 3 |
| | 3 | 6 |

| ANG | | |
|-----|----------|------|
| JAN | thru JAN | |
| | 1979 | 1978 |
| | 0 | 0 |
| | 0 | 0 |
| | 0 | 0 |
| | 0 | 0 |

| AFR | | |
|-----|----------|------|
| JAN | thru JAN | |
| | 1979 | 1978 |
| | 0 | 0 |
| | 0 | 0 |
| | 0 | 0 |
| | 0 | 0 |



TAC Flight Safety Trophy Winners

479th TACTICAL TRAINING
WING
HOLLOMAN AFB, NM
17 JAN 78---16 JAN 79

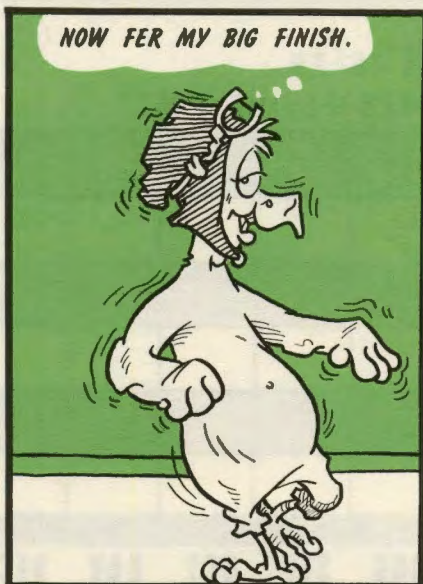
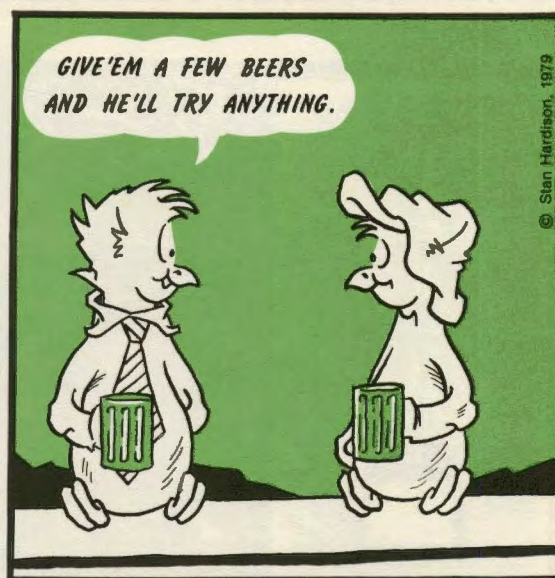
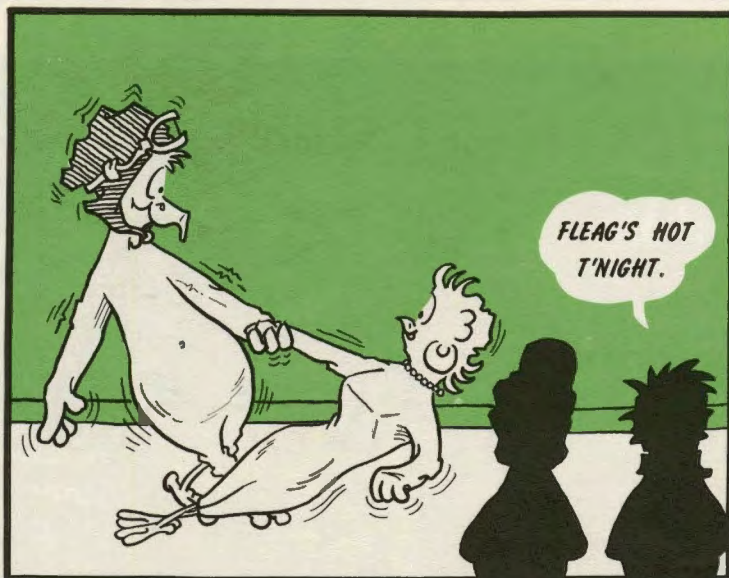
156th TACTICAL FIGHTER
GROUP (ANG)
MUNIZ ANGB, PUERTO RICO
24 JAN 78---23 JAN 79

CLASS A MISHAP COMPARISON RATE 78/79
(BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

| TAC | 78 | 16.0 | | | | | | | | | | | |
|-----|----|------|--|--|--|--|--|--|--|--|--|--|--|
| | 79 | 6.8 | | | | | | | | | | | |
| ANG | 78 | 0.0 | | | | | | | | | | | |
| | 79 | 0.0 | | | | | | | | | | | |
| AFR | 78 | 0.0 | | | | | | | | | | | |
| | 79 | 0.0 | | | | | | | | | | | |

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

FLEAGLE



CRACK!

