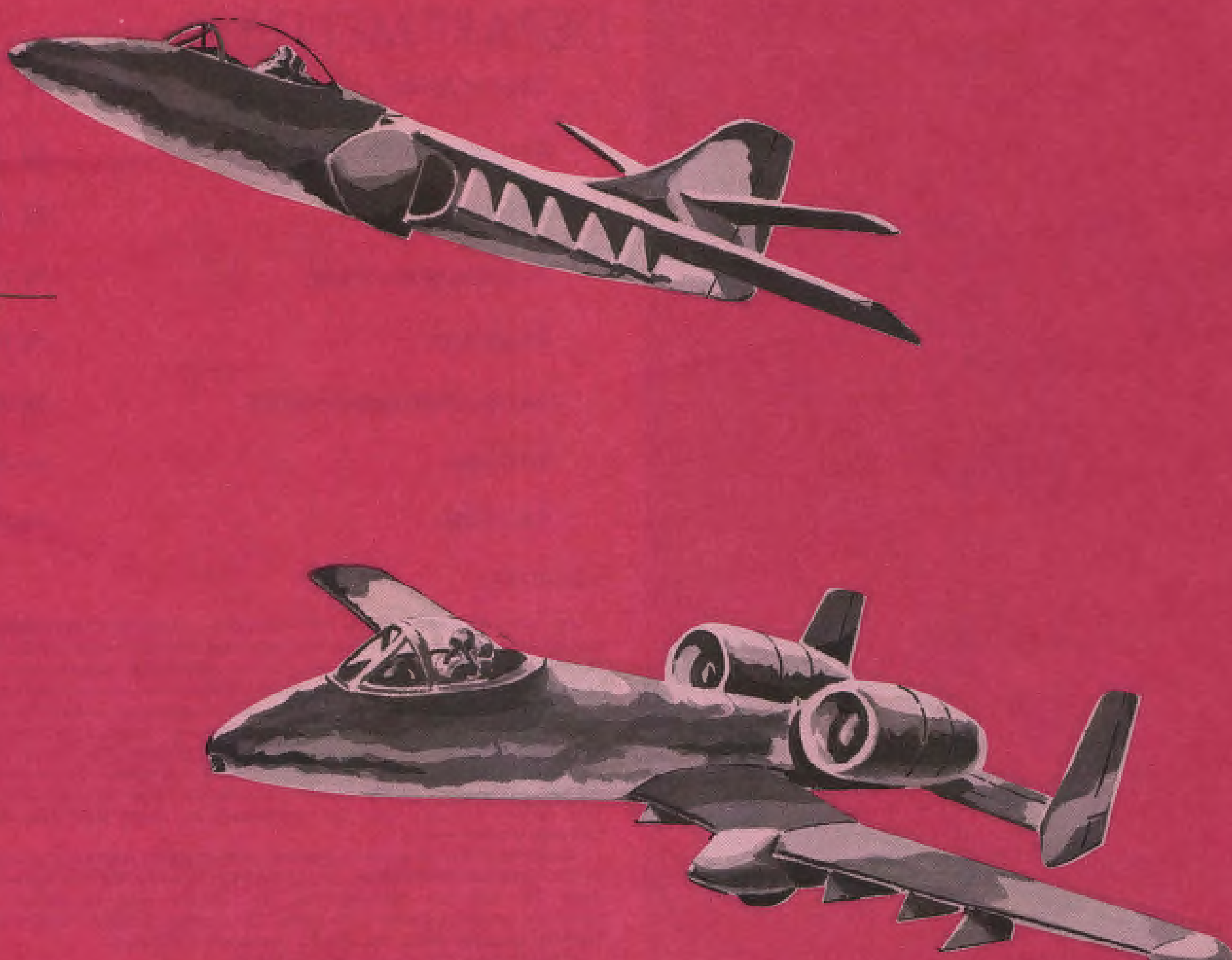
TAC ATTACK

JULY 1972



THE A-X...Pg 16

for efficient tactical air power

TAC ATTACK

JULY 1972

VOL. 12, NO. 7

Tactical Air Command

COMMANDER
GENERAL WILLIAM W. MOMYER

VICE COMMANDER
LT GEN JAY T. ROBBINS

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COLONEL GERALD J. BEISNER

editor
Maj Tim Brady

assistant editor
Capt Jim Young

art editor
Stan Hardison

layout and production
SSgt Lindsey Cobb

managing editor
Mariella W. Andrews

CURRENT INTEREST

DEPARTMENTS

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

THE SECOND LEVEL RISK

Which year would you guess has been the most successful in the military flying business in terms of accident record improvement over the previous year? 1971? 1968? 1955? No, not any of those. Try 1945. We wrecked only 6,000 airplanes that year, which was a lot better than 1944 when we bashed 16,000. Going back one more year to 1943, the record indicates we wrecked 22,000 airplanes in the United States alone.

There's little doubt that over the long haul the safety story has been a success story. It had to be. Why? Money, gentlemen, plain and simple. While our accident rate has improved by an annual 30 percent reduction for the last three years, the savings in dollars hasn't been that much. The answer there is pretty simple also. Our equipment just costs more today than it did three, five, or eight years ago.

And speaking of five years ago (1968), we accidentally destroyed 73 aircraft that year in TAC alone. That's a significant figure because it's exactly the same number of aircraft that are included in the FY 73 Weapons Procurement Program for the entire Air Force!

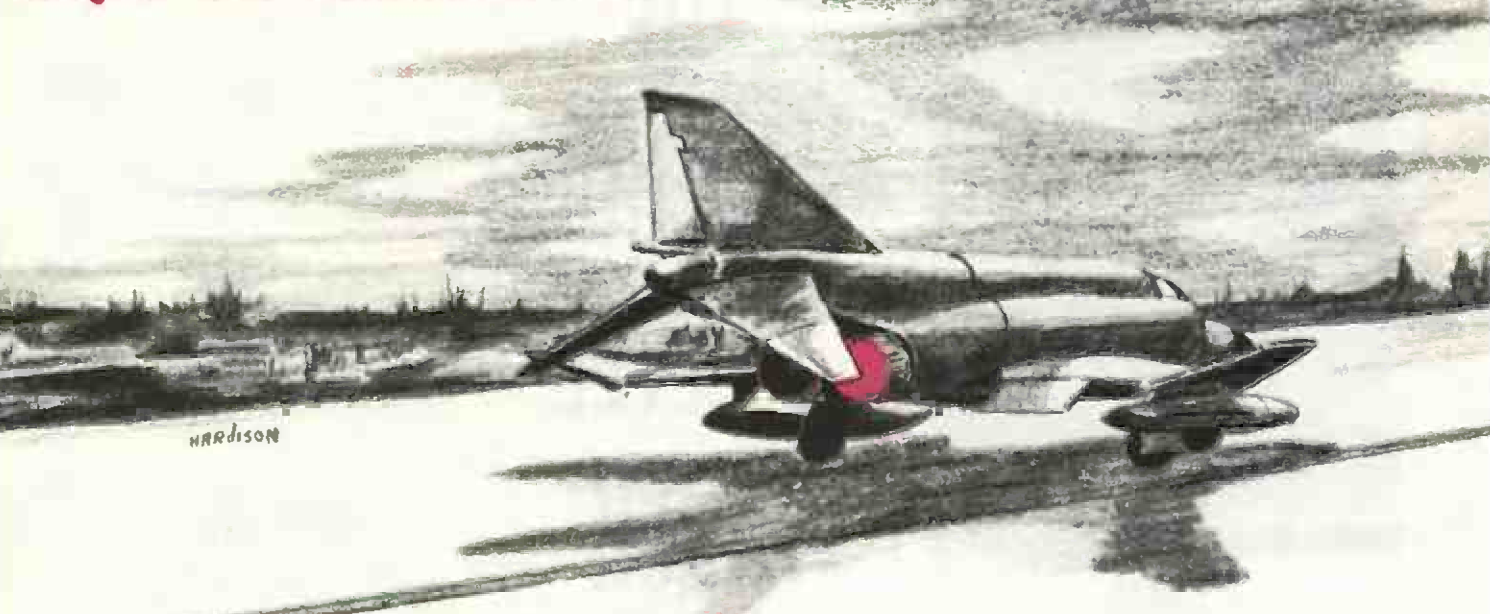
Taking another statistical plunge, where do you think the majority of our accidents are happening? Are most occurring in the high risk areas such as night weather formation, trans-oceanic deployments, or the hairy maneuvers we go through in weapons delivery training? No! While some have occurred during weapons delivery training, more command control, supervision, professionalism, air discipline, and such have been applied to these easily identifiable high risk areas. Causing the biggest problem now are the second level risk areas – things such as crosswind landings, simulated precautionary landings, takeoffs, and formation landings.

Thus, it's these areas that need attention now and our efforts to make them safe must be increased. However, we can ill afford to neglect any area, so let's not let a suppressed hazard jump up and bite us because we became engrossed in fighting another problem. Overcome the second level risks while keeping the high risks under control.

This task I now leave to you. PACAF calls and this is my final Angle of Attack. In closing, I would like to take this means to convey my deep appreciation to all of you who have worked so hard and who have done so much in accident prevention. I know that you will offer the same cooperation to the next TAC Chief of Safety. Fly safe and keep up the hard work!

GERALD J. BEISNER, Colonel, USAF
Chief of Safety

F-4 ENGINE FAILURE ON TAKEOFF



"Gents, this is a super good article recommended for all F-4 types. (There's no penalty incurred if you don't happen to fly the Phantom and want to read the article.) The author, Major Dick Penn, has some good words sprinkled with lots of good old-fashioned humor and most important, there's a message. Ed.

by Major Richard L. Penn, Jr.
9 AF, Shaw AFB, SC.

There are advantages to being a single-engine fighter pilot. Perhaps most important is that it's not necessary to take a lot of crap from Thud drivers about being a "two-engine-bomber pilot." I know because I used to be a single-engine type myself,[1] and I remember those carefree days of simple procedures: if the engine quits — airstart it and continue; if it don't airstart - jump out. Compare that exciting, idyllic life with the harassed, sometimes groveling existence of the many-motored type when he's caught up by the threatening question of a stan-eval weenie or flight commander: "Whaddya got 'n whaddya use if the right engine fails with bus tie open?[2]

Nowadays everyone's life is getting more complicated. Because of advancements in ejection seat technology, the single-engine type faced with an engine failure on takeoff must make a decision: abort or punch out on the runway. That can be a pretty tough choice if a lot of concrete has already been passed. But it's even tougher for some guys. In these days of the escalation of complication, the two-engine pig still leads the pack. An engine failure late in the takeoff roll poses three choices:

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1. That's what's known as poetic license 'cause in real life, I'm a T-bird pilot. But in poetry is the essence of truth; mathematics is an approximation. We all know that Douglas Bader, John C. Meyer, and the Red Baron flew single-engine fighters, wore big wrist watches, etc., and I must perforce identify with them or suffer the loss of all credibility. There was Tom McGuire, but imagine what he could have done with a P-51.

2. Case histories on this subject are more fully explored in a scintillating and scholarly treatise found in the June '72 issue of "The Military Chaplain Quarterly Review."

punch out, abort, or try to fly. This omes what is called a thinking i's game, and that's unfortunate because fighter pilots have to play.

I beg your consideration of the three choices from your present vantage point (stall, coffee bar, et alibi) in the hope that should fate call for your next decision somewhere well down the runway, you'll be able to decide the issue more expeditiously and judiciously:

I. THE OPTION TO PUNCH OUT

A. The affirmative case for punching out: It might work.

B. The case against punching out:

1. It's scary. I'd as leave bite an elephant in the posterior as to try that trick, and I'm near fearless.

2. For some reason or another, a large number of the troops who've tried it, have not been successful. Although 140 knots on the runway is within ejection parameters of all our equipment, something or other often (or usually) goes wrong h as, the pilot delays one-half cond to pick his nose and a fatal flaw creeps into the calculations).

3. It would be an unusual circumstance indeed that an F-4 jock is denied both of the other alternatives, so let's stick with the aircraft (heh, heh, that's a pun, get it?).

II. THE ABORTION OPTION

A. The case for abort: All my arguments for abort assume that there's enough concrete in front of the nosewheel to make the plan work even without a barrier. My philosophy is to compute my abort chances right down to a gnat's ear without planning for a barrier, and then if the barrier is engaged successfully (which it almost certainly will be), I'm really in fat city! Specifically, that means that I'd determine the MAXIMUM abort speed from the book, and if an engine fails AT ANY TIME before that speed, I would certainly abort and try for the barrier. But, even if I miss the barrier, I should be able to stop somewhere on the concrete. (Do you include the overrun as part of the available runway in abort computations?) But somehow, there seems to be a popular opinion around that if there's enough runway out front to get airborne on one engine, that's the better choice. The "Book" implicitly encourages this line of thought by publishing a "Minimum Go Speed" chart that shows some of the ridiculously low airspeeds from which a single engine takeoff is possible. I've heard it said, "Ah, even a very heavy airplane, with an engine failure at 100 knots . . ., if the runway is the usual length, it'll fly." Indeed it will, as confirmed by the book,[3] BUT, if one engine has just quit without warning, what are the chances that the other will also quit within a couple of seconds? I mean, like, maybe that first engine quit because something was broken, so then that same "broke thing" could make the other engine quit, too. Or maybe when the first one quit, it broke something, like a fuel line or a hydraulic line off the other system. If you continue, there may soon be an explosion that you won't hear from where you're sitting.

B. The case for continuing takeoff:

1. The takeoff thing may have progressed to a point from which an abort would be quite hairy. What point is that? Other than the maximum abort speed to be found in the charts, I think that nosewheel lift-off is a sort of natural watershed because after that, it's a pretty big project to get all your thinking turned around to "no-go." But, again, if there's really a lot of runway out front . . .

2. It makes a better story. Why, you could even get a "Well Done" award — 'n that's better'n a poke in the eye with a sharp stick, ain't it? Get something good on your ER and, if it's really spectacular, you might even want it on your tombstone. But just you try and make a good story out of an abort at 135 knots with 8000 feet remaining! Even a guy with experience as an In-Country Awards and Decs Officer would have a tough time with that one. So go ahead and get airborne, declare an emergency, get the Wing Commander's attention[4], and then demonstrate some tricky airmanship. Prove yourself in the crucible of airborne emergency! Grrrr! Tales of derring-do. Back to the timorous soul who aborts, he'd look pretty silly declaring an emergency while turning off the runway, wouldn't he?

III. THE TRY-AND-MAKE-IT-FLY OPTION

A. The airplane will now require an extra nine (the book says 8) knots flying speed than was computed for a two-engine liftoff. (Ref. Dash One, Page 3-5.) This is because of the reduced vertical thrust vector. Two-engine max thrust is 25,100 pounds (more or less, at our conditions of 190 knots, 90°F, 500 feet MSL). One-engine max thrust is 12,200. That's a thrust loss of about 13,900 pounds, ain't it? Multiply that by 0.342, which is the sine of 20°, cause that's the sum of the engine installation angle and the takeoff

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3. On a 10,000 foot runway, standard day, engine failure at 100 knots, a very heavy airplane could ually get airborne. (Alternatively, it could abort with 4000 ft to spare.)

4. Right now, he probably wouldn't know you if he stumbled over you in a bar, so get some exposure. Remember also that accident reports are distributed worldwide. Our allies and even the Navy get to hear about the really juicy ones.

F-4 ENGINE FAILURE ON TAKEOFF

angle of attack,[5] and the result is an equivalent extra weight of 4750 pounds. So, at two knots per thousand, that's about nine knots extra.

B. Much more distance will be required to accelerate to liftoff speed than was computed for a two-engine takeoff. The extra nine knots is a minor part of the story. The real problem is the great loss of excess thrust for acceleration. For example, with nosewheel down, drag might be, say, 5000 pounds at a good high speed. Then with two engines, excess thrust is about 21,000 pounds. At that same speed, single engine excess thrust is only about 7000 pounds, or JUST ONE-THIRD AS MUCH! Thus with engine failure, it's gonna take a lot more runway,[6] even if the nosewheel is left on the ground all the way to takeoff speed.

C. The real danger arises from the fact that takeoff attitude can be established well before reaching takeoff speed. In that case, drag goes up right out o' sight, and eventual salvation would depend, not on how many miles of runway remains, but on reducing gross weight by burning off fuel. Stabilator effectiveness is unaffected by all this discussion, so even in a C or D, the nose can be lifted off at 160 knots or so. A man's understandable anxiousness to get airborne before reaching the toolies just might sucker him into an early establishment of takeoff attitude – and that would be death with a single engine.

D. So then, my recommended technique for getting airborne on one engine:

1. **Don't punch the outboard stores on the runway.** Getting to the switch seems to me to be a great distraction, but mainly, when detached from the aircraft, that garbage becomes potential FOD which could buggar up a wheel. Didja ever notice how close a tank rides to the main gear, and that almost ALL of it is forward of the wheel? If ya hit one of those big things, ye'd be in a heap o' trouble, but the risk really isn't necessary.

2. **Leave the nosewheel firmly on the concrete until the machine is ready to fly, then snatch it off (but don't over-rotate).** In that one sentence is almost the whole thing, and even fighter pilots should be able to understand it.[7]

E. **What to do when airborne:** Actually, with a max gross weight air-machine, that's when you're really in a world o' hurts. I figure that at 195 KIAS, a 58,000 pound airplane's gotta have 17 units alpha just to maintain straight and level. At that AOA, drag is just over 12,000 pounds. Thrust is gonna be (cos 20^{o} x 12,000) 11,500 pounds. **BEHIND T[HE] POWER CURVE.** There are at l[east] three possibilities at this point:

1. Hold it like it is: Then, airspeed will decrease, lift fades, and the aircraft will descend. From the scenario, we may guess that all the concrete has been used up so the machine settles back to earth where the gear will encounter strong front loads from blades of grass, elephants, school buses, grains of sand, etc. Bad. This will probably induce a tumbling motion for which recovery techniques are not taught at UPT.

2. Lower the nose to maintain speed: Same result as in "1" above.

3. Punch Panic Button without undue delay. This should reduce gross weight to about 40,553 pounds, and decrease frontal drag considerably. The pilot now has the program by the scrotum.[8] About 10 or 11 units alpha will maintain level flight. Since that's only 6000 or 70[00] pounds drag, there's ample ex[cess] thrust available to make the airpl[ane] climb. Indeed, a gentle climb would probably be most appropriate at this time.

F. If course was the last choice selected, then the remaining steps are to land ASAP, and review the checklist before the inquisition starts. A "Well Done" award would sound pretty silly if it said, "He survived in spite of himself."

→

5. I'm figuring 17 units alpha, not the 10 – 12^{o} suggested someplace in the pilot's manual. Now 10^{o} ain't no bad attitude in some situations, but with a heavy airplane, unstick speed would be up around 220 KIAS – then what if the flaps blow up?

6. Yeah, I know, the Dash One also recognizes that it takes more runway to get off on one engine than on two.

7. What is the Dash One recommended technique? It don't say. Therefore, we may assume it envisions rotation in the usual manner. This assumption is confirmed by looking at the "Minimum Go Speed" chart which looks like it is based on a drag of 'bout 5000 pounds, increasing to maybe 9000 pounds toward the end of the run. Anyway, my snatch technique should SAVE 1000 to 1500 FEET.

8. Lip readers will notice the assonance. A trained staff weenie, if there is such a thing, will skim right over that at 900 – 1200 wpm, thus missing some of the richness of our native tongue.

TACTICAL AIR COMMAND

AIRCREWMAN of DISTINCTION

CAPTAIN BURCHETTE

Captain Jerry E. Burchette of the 4500th Air Base Wing, Langley Air Force Base, Virginia, has been selected as the Tactical Air Command Aircrewman of Distinction for the month of May 1972.

Captain Burchette and his crew were en route from the Pentagon helipad to Andrews AFB for a fuel stop in a UH-1P helicopter. Upon leveling at 1000 feet, Captain Burchette noticed a left yaw condition which he attempted to correct by applying right pedal. (The rudder pedals in the helicopter are anti-torque devices which control the angle of attack on the tail rotor blades.) The left yaw persisted. As he applied increasing right pedal pressure, it became evident that he no longer had any anti-torque control. He found he could apply full right or full left pedal without any change in aircraft attitude. Had the tail rotor control failure occurred a minute or two earlier during his climb out from the helipad (slow airspeed and high power setting), it would have been virtually impossible to control the helicopter. By maintaining forward airspeed, the airflow assisted in reducing the yaw condition.

Captain Burchette and his crew assessed the nature of the problem and realized that the only way to control the helicopter during landing would be to maintain forward airspeed during touchdown. He alerted Andrews Tower, declared an emergency, and by varying airspeed and power setting he was able to control the amount of yaw. Too much power would result in a right yaw, reduced power would swing the nose further left. Captain Burchette elected to make a long shallow approach so that he could maintain airspeed and yet descend without making an excessive power reduction. He advised the tower that he would make a slide on landing to a grass area adjacent to the runway. The first approach resulted in a go-around because of excessive yaw. On the second approach, he maintained approximately 30 knots airspeed which resulted in a left yaw. Just prior to touchdown, he increased the power slightly which swung the nose back to the right, thereby aligning the helicopter with the flight direction. The skids touched and the helicopter slid along the grass. Captain Burchette gradually reduced the power until the helicopter came to rest.

The outstanding airmanship and judgment displayed by Captain Burchette in response to a serious emergency prevented the loss of his UH-1P helicopter and possible injury to him and his crew. These actions certainly qualify Captain Burchette as a Tactical Air Command Aircrewman of Distinction. ➤

SPOS COR

Back in November 70, TAC ATTACK launched a new series entitled "SPOs CORNER." It was intended to give you the straight skinny on what was going on with your airplane as seen through the fiery retinas of the Systems Project Officers (SPOs) at TAC Safety.

The series sputtered through a few issues then ground to a halt until someone realized that even old ideas can be good ideas. Hence in January 72 the series was reinstated and has been going strong ever since.

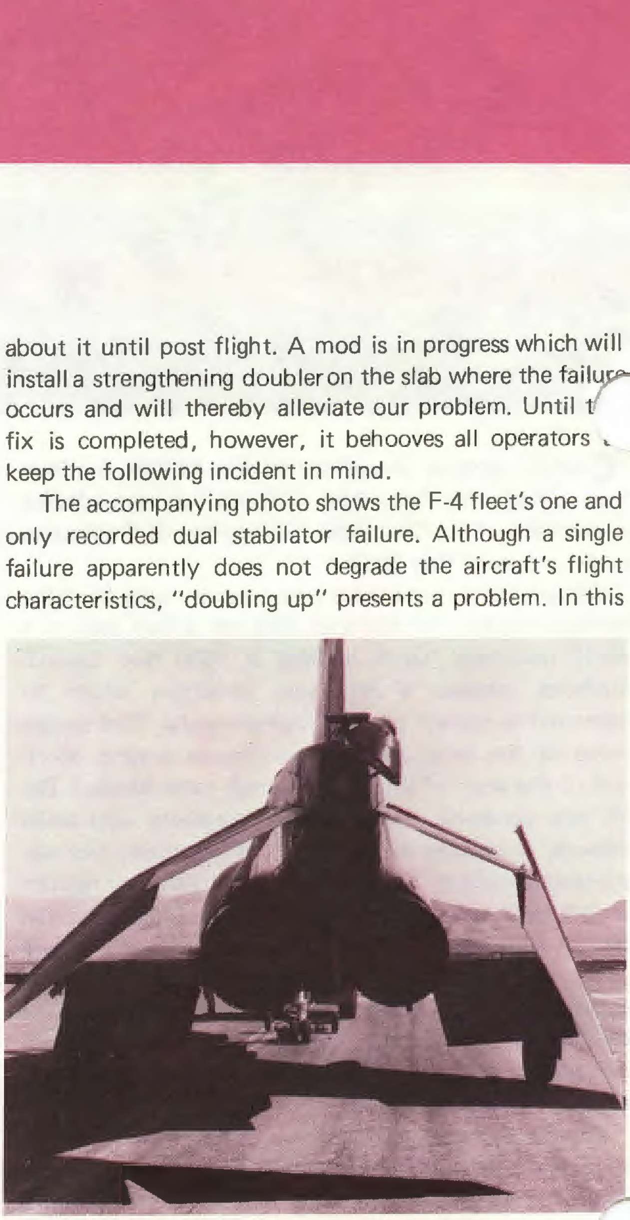
"SPOs Corner" will appear in every issue of TAC ATTACK filled with "what's going on now" stuff, and will, hopefully, provide a window from here to there. The window has a telephone at both ends. We know your telephone number; ours is Autovon 432-7031. All of the SPOs can talk with some degree of understandability and two of them can even read. (Drop them a line to Hq TAC/SEF, Langley AFB, VA 23365.)

Your feedback is essential. Ed.

STABILATOR "DROOP"

F-4s on occasion have lost the outboard portion of one of the stabilators – usually during high G missions. The jocks have not noticed any unique control characteristics after these failures and in most cases they didn't find out about it until post flight. A mod is in progress which will install a strengthening doubler on the slab where the failure occurs and will thereby alleviate our problem. Until t fix is completed, however, it behooves all operators keep the following incident in mind.

The accompanying photo shows the F-4 fleet's one and only recorded dual stabilator failure. Although a single failure apparently does not degrade the aircraft's flight characteristics, "doubling up" presents a problem. In this



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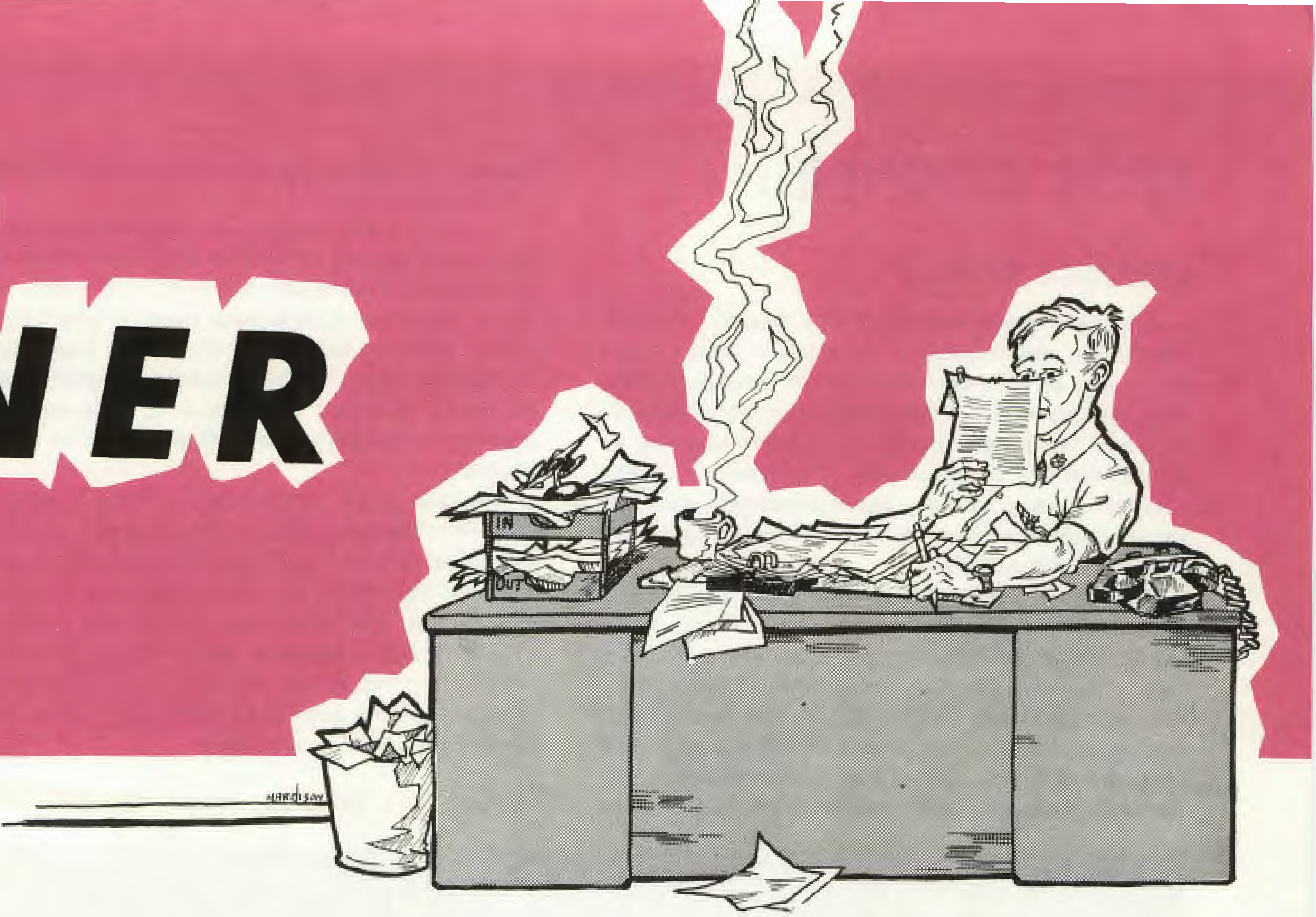


Once the slab failed during a pitchout after an ACM mission, and resulted in a very wide pattern even with full back stick. The aircraft was controllable in the normal landing configuration with full flaps at 190 knots and the intrepid aviator elected to continue the pattern and land. The arrival was harder than optimum and a tire blew. Indications are that the wheels were locked at touchdown (for reasons unknown) and therefore the resultant damage is not directly attributable to the slab problem or the firm touchdown.

As a result of this mishap the Dash One will be modified to specifically cite aircrew actions in the event of stabilator failure. In the interim, you are still covered if you follow existing structural failure procedures, such as, make a controllability check with the gear down and flaps UP, find the acceptable magic airspeed figures, then bring it home and apply this recently acquired wisdom.

Why flaps up? The incident aircraft was landed with full flaps which undoubtedly blanked out critical amounts of the remaining usable stabilator. "No Flap" appears to be the way to go. Additionally, a good visual check within the element of flight at the completion of an ACM or other high G mission may prevent that last minute sinking sensation on final.

Maj Burt Miller

A MATTER OF COMMUNICATION

A review of last year's hazard reports brought to light the following situation which could have had serious consequences.

A flight of fighters were scheduled to refuel with a tanker and the fun began. The tanker pilot had this to say: "We arrived at the ARCP (Air Refueling Control Point) at FL 220 and entered a left hand orbit waiting for the first flight of two receivers. They had difficulty contacting us on the primary AAR frequency. On initial radio contact, I asked for their position and altitude and lead stated they had left the ARIP (Air Refueling Initial Point) and were heading toward us at FL 220. At that time . . . our position was within 25 miles of the fighters. I immediately told them to descend to FL 200 and return to the IP."

Fast action by this pilot may have prevented a midair! The salient points of the investigation which apply to we receivers are:

a. Positive radio contact between receiver and tanker will be established prior to departing the ARIP.

b. Vertical separation will be maintained until visual contact is established.

Capt Al Mosher

SPOS CORNER

AARDVARK VS H_2O

A problem exists with the F-111 that isn't new but may not be well understood. A couple of years ago, we almost lost an Aardvark when she ran through puddled water on takeoff roll. The puddled water, when struck by the nose tires, sprayed up and out in a direction directly in line with the engine intakes. This ingestion of large amounts of water caused a severe compressor stall. The aircraft could not be stopped on the remaining runway after aborting the takeoff.

This type of compressor stall (cold stall) is caused by a pressure differential across any or several of the engine airfoils. Some conditions can cause the inlet pressure to drop to a value which is too low in respect to the discharging pressure. The air at the high pressure side reverses its direction and flows to the low pressure side (rear to front). This type of stall is referred to as a cold stall since the turbine inlet temperature rises only slightly, due to a momentary change in inlet pressure differential then recovers quickly.

Since the initial incident, the same problem has b encountered several times. The most recent occurrences have involved F-111s with the new P-100 engines which are just as critical as far as water injection goes. When this beauty backfires (compressor stalls), the blades on the first fan stage bend forward toward the intake because of the reverse flow and strike the inlet guide vanes. This, obviously, is causing a great deal of concern for everyone involved.

The appropriate question arises, "What is being done about it?" Several ideas are being evaluated at different levels. One solution may be a tire designed with a sidewall deflector that forces the water away from the intakes. This project and others are in the mill. Meanwhile, comments and suggestions from you jocks could be helpful. The message to all Aardvark squadrons which prohibits takeoffs through puddled water will remain in effect until the problem is solved.

Lt Col Des Jardins

TACTICAL AIR COMMAND

Maintenance Man Safety Award

TSgt Pesce

Technical Sergeant Francesco Pesce, 415th Special Operations Squadron, Hurlburt Field, Florida, has been selected to receive the TAC Maintenance Man Safety Award for May 1972. Sergeant Pesce will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.

TACTICAL AIR COMMAND

Crew Chief Safety Award

SSgt Hansford

Staff Sergeant Stephen V. Hansford, 308th Tactical Fighter Squadron, Homestead Air Force Base, Florida, has been selected to receive the TAC Crew Chief Safety Award for May 1972. Sergeant Hansford will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.

TACTICAL AIR COMMAND

Ground Safety Man of the Month

SSgt Milhorn

Staff Sergeant Kenneth L. Milhorn, 834th Field Maintenance Squadron, Hurlburt Field, Florida, has been selected to receive the TAC Ground Safety Man of the Month Award for May 1972. Sergeant Milhorn will receive a letter of appreciation from the Commander of Tactical Air Command and a Certificate.

FROM BOTTLE TO THROTTLE

by Capt Nathaniel E. Villaire
Physiological Training Officer
USAF Regional Hospital, Langley AFB, VA.

The oldest drug known to man has been produced in various quantities in virtually every society that has left a recorded history. It was referred to by the ancient Egyptians, glorified by the Greeks, and made a center of social attention by the Romans. Alcohol is here to stay.

Why belabor the many examples of intoxication evident around us? We've all seen cases ranging from a slightly flushed face to a staggering, slobbering, stupor. Let's get down to the hard facts involving alcohol and the professional flyer.

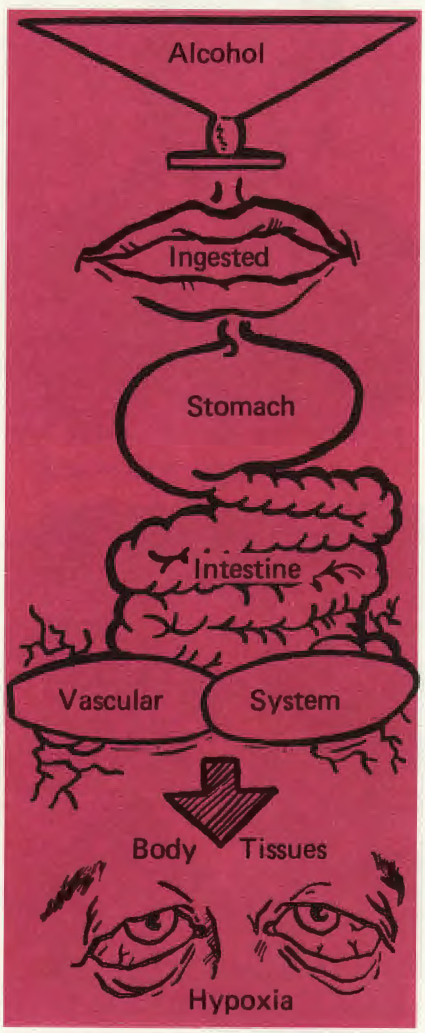
What are the immediate effects?

What are the long range effects?

What is the solution to the problem?

Is the danger real?

The immediate effects? Let's take a look at that jock in the corner over there. Yeah! The one rolling dice and taking his "on the rocks". As he tilts the glass, we find the following sequence of events taking place:



1 oz. of Scotch, Gin, White Lightning, or anything else, he can find that has a "kick".

Produces oral, throat and stomach "fire", which he pronounces as "Mi... "Smooth". Eyes may water slightly.

Little alcohol is absorbed here. Surprised? Eating proteins (steaks, eggs, etc.) inhibits passage to the intestine. Protein must be partly digested first. Fizzle drinks (coke, sprite, champagne, etc.) speed the passage to the intestine.

WHOP!! Alcohol is absorbed "...rapidly, constantly, and completely..." Any question?

That's blood and blood vessels to you and me. This system distributes the alcohol fairly uniformly except in the brain and spinal fluid where concentration is slower in RISING and FALLING.

Muscles, brain, and virtually every other part of the anatomy take on some alcohol. The substance interferes with the uptake and utilization of oxygen by the cells.

Hey! There's a familiar word! Must be a printing error. Isn't this piece about alcohol? Read on!

Would you believe collapse right here on terra firma our old enemy Hypoxia!? Well, maybe not from 1 but have you ever seen a dice rolling jock stop with one drink? (OK! So you know an exception.) In any case, hypoxia is the end result. In this case the TISSUES of the body have been POISONED by alcohol, which DEPRIVES them of OXYGEN. Translating all this into medical jargon produces:

Histo – (tissue) + toxic (poison) = Histotoxic

Hype – (low + oxia (oxygen) = Hypoxia

That's a fancy way of telling a guy he's "smashed". He has Histotoxic Hypoxia.

Do you remember some typical hypoxia symptoms from your last altitude chamber ride? Does "dizziness, tunnel vision, hot and cold sensations, personality changes and poor coordination" sound familiar? Just as your ability to fly effectively is hampered or destroyed by hypoxia at altitude, your ability to maneuver one foot in front of the other while on the ground and under the influence of histotoxic hypoxia is similarly affected. Need I say more?

Unfortunately, the similarity between altitude hypoxia and histotoxic hypoxia ends here. You can treat altitude hypoxia successfully with 100 percent oxygen but it won't help the histotoxic type. There are few, if any, after-effects from the first; there is a miserable "I've got to die get better!" feeling from the second. One allows you to continue working after treatment with oxygen; the other allows you to have a severe headache, bloodshot eyes, nausea, and poor coordination for hours and hours. You may not be a competent flyer for a long time after a bout with the bottle!

There's an Air Force saying, "Twelve hours from bottle to throttle..." therefore you must be OK after twelve hours. Right?

Maybe . . . . . .

Here is what happens to the alcohol. It is transported through the liver where it is slowly detoxified. Detoxification averages about 1/3 ounce per hour for a normal individual (that translates to about 1 ounce every 3 hours). [Ed Note: The old one ounce per hour figure that you're probably familiar with was based on a low alcohol content drink and is no longer valid. The percentage of pure alcohol in your favorite brand, depending on what it is, may vary from 10 percent to 100 percent and the more the alcohol content, the longer the detoxification process. Play it close to the vest; use the one ounce per three hour figure.] As a professional, you should remember that figure. How about some examples?

Colonel J. Daniel drinks 2 ounces of alcohol, and since it takes 3 hours to detoxify each ounce, we have: (2x3) = 6 hours before alcohol elimination. The Colonel will comply with the 12 hour edict anyway, so he will be in good shape to fly.

Major Beefeater drinks 5 ounces of alcohol. His equation is (5x3) = 15 hours. The Major shouldn't even be around an airplane for 15 hours! Notice that the Major can comply with the old adage and still bust his...because he is under the influence.

Is the danger real? You know it! You know of cases when a flight shouldn't have taken place, don't you? We've seen gents bending the elbow at the bar when everyone knew he would be in the air by dawn . . . right?

Professionals do not compromise excellence. You are judged as a professional by your training, discipline, and deeds – not directives. Know why there are rules. Know the limitations of rules. Beware of "Twelve hours from bottle to throttle." ➤

CHOCK TALK ...incidents and incidentals

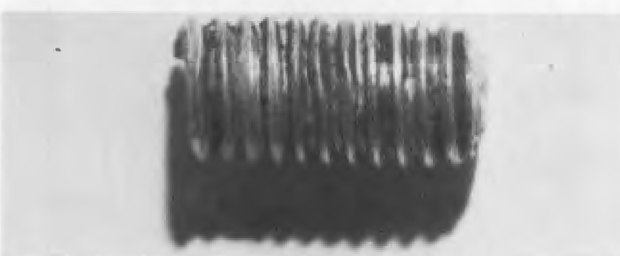
chock talk ...incidents and incidentals

THE MESSAGE IS OBVIOUS

While going through some basic flight maneuvers the F-4 aircrew noted restricted stick travel. The stick in both cockpits could not be moved more than one to two inches aft of the neutral position. The stab aug system was disengaged and engaged with no effect. The crew then performed a controllability check in the landing configuration and determined that an acceptable descent rate was possible at 220 knots (CAS). They declared an emergency and flew a long straight-in approach. The landing was uneventful.

Post flight investigation found the cause of all their troubles. A piece of a 10/32 inch bolt was lodged in the stabilator bell crank assembly located in the left forward missile cavity. Apparently the bolt had been used as a rig pin and during the process of rigging was broken off, but not removed. It worked loose and jammed in the bell crank assembly causing the binding.

Gentlemen, the message is obvious.



Bolt used as a rig pin broke and was not retrieved.

It made its way to this position and caused flight control (stabilator) binding.

FOAMING OIL

After fifteen minutes of flight the A-7 pilot noted the oil pressure to be fluctating 3 to 5 PSI and the average pressure dropped from 32 PSI to 22 PSI for 30 seconds then returned to normal. The jock headed for home and the step drop in oil pressure occurred three more times before the pilot got her on the ground for an uneventful landing.

It is suspected that the fluctuations were caused by foaming oil caused by improper servicing. It seems that if the oil can is not agitated prior to servicing the heavier anti-foaming agent will settle to the bottom and not enter the oil system. This leads to a restiction in the oil pressure regulator and results in a step-function in oil press response.

So, the point is this. SHAKE WELL BEFORE POURING.

THUD SHORTSTOP

by: Lt. Col. Lou Kenison
TAC/SEF

Baseball season is here and it looks as if the F-105 might make a pretty effective vacuum cleaner at short stop. At least one Thud unit received an effective demonstration of such when the pilot was running the engine at 75 percent prior to shutdown. The crew chief removed the tank pins from the nosewheel compartment pin bag and then attempted to thrown the pin to an assistant standing by the right main gear . . . ZAP . . . Gulp. You guessed it. The Thud gobbled up that line drive faster than you can say Maury Wills. Cost to repair the J-75 will be $13,450 which per catch has to make it the most expensive "short stop" around.

Moral: Don't put anything loose near an F-105 intake . . . it's an automatic OUT!

with a maintenance slant.

INCREDIBLE

Ed. Note: This pitch isn't a Chock Talk in the traditional sense but it deserves to be emphasized and this seems to be the appropriate place to put it.

A young man was on leave and was hunting in the woods near his home. As he was walking along he had the barrel of his loaded 12 gauge shotgun resting on the top of his right foot and was repeatedly cocking the hammer then letting it ease forward gently. The last time he tried it the hammer slipped and boom!

Guess he really didn't need that right foot anyway.

REMOVED AND REPLACED?

While roaring down the runway the pilot noted that the number one engine on the Herky was pulling 2500 inch-pounds of torque less than predicted. He aborted the takeoff and while pulling the throttles to flight idle number one hung up at 10,000 inch-pounds of torque. As the aircraft began to veer to the right the pilot suspected a prop malfunction and directed engine shutdown by use of the condition lever. The engine stopped as advertised and the pilot brought the airplane to a halt on the runway. During the cleanup portion of the engine shutdown checklist, as the pilot attempted to move the number one throttle toward the full forward position, he discovered it would not move forward of flight idle. In addition he determined that the condition lever was also binding.

When maintenance dug into the machine they found that a bolt in the throttle pulley ring was not installed. This caused the gimbal ring assembly to slip off the fuel control shaft. Maintenance had been performed in this area shortly before engine start to change the fuel flow assembly. During this time a bolt had been inadvertently left off the throttle pulley ring.

When one removes, one must also . . .

OUT O' SPACERS?

Word comes to us from one of our TAC bases that some T-33s and T-39s (transient type) have not had proper tire maintenance performed. In changing tires on some of these airplanes it was noted that some were not equipped with a wheel spacer that is required by TO W1-7-1313. This spacer is required to be installed between wheel halves to prevent a reverse bending load through the web area which can result in fatigue cracking radiating from the axle hole. This can lead to complete failure of the wheel and you know what that can lead to.

A quick check now can eliminate a lot of grief later.

Note in this photo the wheel spacer is missing.

Here's what it should look like with the spacer properly installed.

the A-

As a potential future addition to the tactical inventory, the A-X specialized close air support aircraft is generating increased interest. Because of the competitive nature of the prototype development, much of the specific information concerning each contractor's version of the aircraft is properly classified as "Competition Sensitive" by the contractors and the Air Force and has not been released. Additionally, since a decision on production will not be made until a future date, detailed plans for integration of the A-X into the TAC fleet are not yet available. However, the rationale behind the A-X program, the established requirements for the aircraft, and some features of the prototypes are available.

The purpose of this article is to provide a look at this new item of equipment which is possibly on the horizon for force modernization. Many of you may fly the A-X, many others may work on it or support it in a variety of ways, and certainly many more will benefit from its addition.

The Northrop A-9A and the Fairchild A-10A, the competing A-X prototypes, have flown successfully at Edwards AFB and are now undergoing flight testing and evaluation by contractor and Air Force personnel. TAC, as the principle operating command for this potential new weapons system, has been deeply involved in the development of the A-X and will be active in all further testing and evaluation of the prototypes until the source selection and production decision actions are completed.

This writer, as the TAC member of the A-X Systems Safety Group, has had the opportunity to examine both prototypes at various stages during design and construction and has even "logged" a little cockpit time in each. Both aircraft make a very favorable impression and, at this point, each appears to have an excellent capability to perform the required mission.

A-X EVOLUTION

Following a close air support study conducted in 19 the Air Force directed that action be initiated for a aircraft specialized for the close air support mission. Thus, the A-X concept was launched. Preliminary specifications were drawn up and design study contracts were awarded in 1967. Subsequent evaluation of these studies led to refinements in the specifications to achieve savings in size, weight, and costs. Formal Requests for Proposals were issued to 12 aircraft companies in May 1970 and six responded with proposals. In December 1970, the Air Force selected Fairchild Hiller (Republic Division) and Northrop Corporation as the finalists and awarded contracts totaling about $70 million for building and testing of two prototypes by each contractor. This "fly-before-buy" competitive procurement approach was a departure from the commonly used single-source selection for prototype construction and was possible due to the relatively low cost of the A-X program. With contract approval, Northrop and Fairchild initiated priority actions to complete design and construction of the prototypes under a closely supervised Air Force program managed by Colonel James E. Hildebrandt, System Program Director, Aeronautical Systems Division of AFSC at Wright-Patterson AFB, Ohio.

Prototype designations of A-9A for Northrop and A-10A for Fairchild were assigned as both contractors

X

by Lt Col William D. Neal, Jr.
HQ TAC/SEP, Langley AFB, VA.

worked toward a first flight in June this year. Following several Air Force Design and Safety Reviews, the first prototypes were transported from each contractor's plant to Edwards AFB for additional ground testing and for the final safety inspection and review before flight. Both versions of the A-X were successfully flown in May. From ototype contract to first flights required less than 18 onths. Slightly more than six months of intensive testing by contractor personnel and competitive evaluation by Air Force personnel, which includes mission suitability and overall maintainability, will be required before source selection is made and the anticipated production contract is awarded. If production is approved, up to 600 aircraft may be built at a contract cost per copy not to exceed $1.4 million (based on 1970 dollars and a total buy of 600).

WHY AN A-X ?

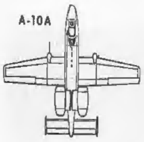
Close air support (CAS) is an Air Force mission, and experience in SEA has left no doubts concerning the operational requirement for a highly survivable aircraft that can provide rapid, accurate, and sustained support for ground troops, deliver a wide range of ordnance, and perform a variety of other important tasks such as escort and rescue support. The record established by those aircraft employed for these purposes in SEA speaks for itself and needs no embellishment. Few will belittle the accomplishments of aircraft such as the A-1, A-26, B-57, T-28, AC-47, and follow-on gunships, as well as the F-100, A-37, F-4, and others used to varying degrees in CAS and special missions; however, most of these are old vehicles and none were designed specifically for the roles into which they were pressed. Although the Air Force has proven that it possesses the flexibility to accomplish the mission with whatever equipment is available, to get the job done most efficiently and most effectively, an aircraft optimized for the role is required. One can hardly expect the same vehicle designed to intercept MIG 23s at 50,000 feet to be equally as effective at providing close air support for extended periods at low altitude.

So what characteristics should the A-X have? It would be desirable to include all the useful CAS capabilities of all previously used aircraft. Clearly, all these will not fit in one vehicle, so the essential capabilities were selected and a few more required characteristics added, based on projected needs.

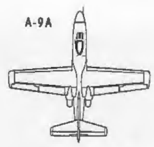
A-X REQUIREMENTS

The motherhood requirements of low cost, high effectiveness, and maximum survivability were appropriately amplified in the initial specification. The A-X would be a rugged, single-place, twin-engine aircraft with STOL capabilities for forward operations. It must possess excellent maneuverability with up to 16,000 pounds of external ordnance at speeds ranging from 120 knots to over 400 knots. The aircraft must also be capable of highly accurate weapons delivery, be easily maintainable to permit austere basing, and be able to survive intensive ground fire.

While the A-X concept called for a new design, it required no new technological development. The aircraft would have a conventional structure, turbofan engines



the A-X



requiring only modest development, and largely "off-the-shelf" avionics. Based on the requirements of the mission and in the interest of economy, sophisticated avionics for an all-weather capability were not specified; however, space provisions for potential growth were included. The basic avionics include a simple heads up display (HUD) giving airspeed, altitude, and dive angle; an optical sight with provisions for laser aiming; equipment for Maverick and Sidewinder missiles; TACAN; VOR/ILS; and UHF, VHF, and FM communications.

The specifications required rapid response with a top speed of over 400 knots, loiter times of one and a half to two hours with a mission radius of 200 to 300 nautical miles, and a fast turn-around capability for high sortie generation.

The required survivability called for armor around the cockpit and critical components, redundancy in flight controls and other systems, twin engines, blast resistant and redundant structure, and "go-home" fuel in self-sealing foam-filled tanks.

For firepower, the A-X specifications stated the requirement for an internally mounted, multi-barrel, high velocity, 30mm gun with a variable firing rate and over 1000 rounds of ammunition, and ten external stores stations designed to carry up to eight tons of ordnance including bombs, napalm, launchers, dispensers, missiles, or gun pods.

THE COMPETING CANDIDATES

The following details on the two versions are not necessarily an exact reflection of the final product, but serve to indicate how each competitor has elected to meet or exceed the minimum requirements.

The Northrop A-9A is a single-place, twin-engine aircraft incorporating straight wing, integrated wing root inlets, and a conventional empennage. It is powered by two Lycoming TF-102 engines (turbofan version of the T-55) each rated at more than 7000 pounds of thrust. The thick, high mounted wing has built-in camber to provide high lift capability and employs single slotted trailing edge flaps. Spoiler type lift dumpers are located on the wing upper surface above the flaps. The tricycle landing gear is conventional, and incorporates nose wheel steering.

The Fairchild A-10A is a single-place, twin-engine aircraft employing a low-wing, low-tail configuration with twin verticle stabilizers located at the outboard tips of the horizontal stabilizer. The two General Electric TF-34 turbofan engines, each with a thrust rating of more than 9000 pounds, are installed in nacelles mounted on pylons extending from the fuselage just aft of and above th wing. The forward retracting tricycle landing gear h short struts and a wide tread. The steerable nose gear retracts fully into the fuselage nose and the main gear retracts into streamlined fairings on the wing with a portion of the wheel permitted to protrude.

Both candidates employ hydraulically powered ailerons (decelerons) which double as speed brakes. The ailerons are split along the trailing edge and when opened serve as speed control devices while retaining roll control capabilities. Each candidate uses an offset nose gear to permit centerline mounting of the 30mm gun to eliminate yaw when firing. The cockpit location well forward of the wing provides excellent pilot visibility over both the side and the nose.

Based on design estimates and the prototypes that are now being tested, the approximate physical dimensions and estimated weights of the competing candidates are:

	A-9A	A-10A
Length	53 ft 6 in	52 ft 7 in
Wing Span	58 ft	55 ft
Height	16 ft 11 in	14 ft 8 in
Wing Area	580 sq ft	480 sq ft
Wing Loading (at BFDW)	43.0	58.0
Empty Weight *	19,457	18,618
Basic Flight Design Weight (BFDW)	24,950	27,842
Max Takeoff Gross Weight	41,300	43,800

* Cockpit armor is included in empty weight shown for the A-9A and is not included in that for the A-10A.

FINAL OBSERVATIONS

At this point, both the A-9A and the A-10A give every indication that they can perform the required job, which will make source selection a difficult task. From an operator's viewpoint, they both look like real flying machines with tremedous capabilities and each promotes a strong desire to pilot one in an operational unit. From a maintainer's or bomb loader's viewpoint, they both reflect that these tasks were major considerations in locating equipment and providing component access. Finally, from a safety viewpoint, the safety features designed into the system from the start and redundancy provided in subsystems included to enhance survivability will certainly contribute to reliability and safety in operation.

The A-X program deserves continued interest, for either an A-9 or an A-10 may well become the future Super Spad.

AIRCREW ACHIEVEMENT AWARD


Capt Muehlberger


TSgt Mathews


Sgt Baer

Captain Gerald Muehlberger, Technical Sergeant Roland A. Mathews, and Sergeant James R. Baer of the 16th Tactical Airlift Training Squadron, Little Rock Air Force Base, Arkansas, have been selected to receive the Tactical Air Command Aircrew Achievement Award.

While on a Phase I training mission in a C-130, Captain Muehlberger was instructing a student in low altitude instrument maneuvers at a transition base when an engine explosion occurred on number two engine. He directed an immediate emergency engine shutdown, abandoned the approach but left the gear down, and instructed the flight engineer and assistant flight engineer to survey the damage. Choosing to complete a thorough inspection prior to attempting a landing, Captain Muehlberger decided to return to Little Rock AFB. The flight engineers discovered parts of the aft engine cowling missing and observed a hole in the pylon fuel tank. Further investigation indicated that parts of the engine had penetrated the left wheel well area, dislodging the gear motor and torque shaft from the forward gear. Due to the battered condition of the gear and the possibility of undiscovered structural damage, Captain Muehlberger decided to chain down the gear while returning unpressurized to Little Rock AFB. A successful GCA was flown despite rain showers and intermittent radar contact. On touchdown, maximum braking and minimum reverse were used because of the possibility of an external fuel leak. Upon shutdown, fuel was discovered dripping into the left wheel well area, numerous holes were visible in the wing and fuselage, and a section of the number two engine turbine was lodged in the fuselage.

The prompt and precise actions taken by Captain Muehlberger and crew in the face of numerous inflight emergencies unquestionably qualify them for the Tactical Air Command Aircrew Achievement Award.

TAC TIPS . . . interest items,

GET YOUR FOOT INTO IT

by Capt Hedley N. Mendez III, USAF MC
Chief, Flight Medicine
USAF Regional Hospital
Langley AFB,Va.

Four F-100Cs departed in formation from a western base for an air to ground gunnery mission. After the mission, the flight returned and entered normal VFR landing pattern at home base for a pitch out. In proper position, number two rolled out on downwind and checked fuel at 1500 over 1100. The gear was lowered and power increased for the base turn. The hydraulic pressure was checked and normal turn to base leg accomplished. Speed brake was lowered and power increased for the turn to final. During the turn to final, an abrupt flameout occurred. The pilot moved the speed brake switch in, then placed the airstart switch to "ON" and selected emergency fuel. He then looked outside, rolled the wings level, and ejected as the airspeed was passing through 150 KIAS. All egress systems worked fine and the pilot noted a good chute over him. Then he noticed that he was going to land close to a building and attempted to change his line of descent by pulling on his risers. Before this correction could take effect, he impacted the ground, both feet hitting simultaneously. The ground, luckily, was of a sandy type soil and the pilot survived the landing. He was wearing rather loose fitting, non-regulation boots and the resultant landing shock was sufficient to break one of his ankles.

This injury could have been avoided by the simple expedient of wearing proper boots. Fortunately, the pilot landed very close to a populated area and was given almost immediate medical attention. In a similar situation and in a more hostile environment, those stylish, non-regulation boots would have made the walk out a tough, if not impossible, one.

Proper boots belong on your feet when you're flying . . . not back home in the closet.

*Ed Note: It's also important to note in this accident that the jock did not have the zero-delay lanyard attached because of a belief that the zero-delay lanyard greatly increases the chance of man/chute, seat involvement. This piece of **misinformation** almost cost him his life. So the point is, play it smart; follow the book. You may not have the extra second this pilot had that represented the difference between life and death.*

Although this boot is stylish and is in keeping with the scarf flapping in the breeze and oil on the goggles syndrome, it hardly has a place in the cockpit of the modern day airplane.

Note the lack of ankle support provided by the non-regulation boot. Check the split side seam near the sole.

mishaps with morals, for the TAC aircrewman

NEAR HITS

Although the immunity granted to those submitting reports during the near-miss study conducted by FAA is no longer with us, the collision potential is just as great, if not greater. The responsibility to report near-misses still rests with the jocks involved. However, when you report a near-miss it is important that you immediately advise the controlling agency of the circumstances. To do so will insure that Air Traffic Control records (tapes) are retained which will aid immeasurably in the investigation. In this business a miss is not as good as a mile. A near-miss is, in fact, a near hit and is an indication of a serious problem. Let's report them, investigate them thoroughly, and eliminate the problem.

DECISION

This incident comes to us from ATC and once again reinforces the dictum: Make a decision and stick with it.

While on an approach the solo student in a T-38 noted another Talon in the takeoff position. When it appeared that the bird on the runway would not clear in time, RSU directed the student on short final to take it around. The student acknowledged and started a missed approach at which time the aircraft on the ground began the takeoff roll. The student then decided that he could make it and reduced power below final approach setting and entered a steep glide path. The student then noticed a slower than normal airspeed and realized that he was going to touch down with a high sink rate so he selected afterburner. The burners lit just as the airplane touched down. The airplane bounced once and remained airborne. The student then brought it around (no doubt shaky) for a low approach so RSU could check the gear which appeared to be all there. A normal landing followed.

Cost to repair the airplane: about $600.

The flight commander had a few choice remarks to make about the decision making process. His advice was free.

SAFETY AWARDS

There's a new TAC Awards Manual out (TACM 900-1) which carries a date of 30 May 72. In Chapter 7 of the manual the TAC Safety Awards are listed. There have been some changes such as: The Semi-Annual Aircrew Achievement Award has been deleted and the monthly award, Aircrewman (Aircrewmen) of Distinction, has been expanded to include eligibility for an aircrewman or entire aircrew. Additionally, the Flying Safety Officer Award has been changed from a semi-annual to an annual award. These are just a couple of the changes; there are a few more.

Safety Officers, both full-time and additional duty types, it would greatly benefit your program to grab one of these new manuals and familiarize yourself with it. The boss might ask questions.

HURT HUNS

The airline technical instructor was demonstrating to students the proper techniques for taxiing a DC-10. As the DC-10 made a 90-degree right turn out of its parking place, the left wing struck the vertical stabilizers of five, I say again, five F-100s parked in a designated and proper parking area. The DC-10 was thirty feet to the left of a clearly marked taxi line which had been painted on the ramp by the airline company specifically for the DC-10.

The crew aboard the airliner did not know they had struck the Huns until an alert ground crewman ran to an office and telephoned the tower to inform the DC-10 crew. Once informed, the crew immediately returned to the parking area. Only minor creases and scratches were found on the DC-10. It was a different story with the F-100s. Two aircraft will require complete replacement of the vertical stabilizers and the three remaining aircraft will require replacement of the vertical stabilizer tip.

It was not stated, but one must assume that the airline technical instructor's taxi technique will undergo some kind of a modification.

Halfway LOOK

At the time of this writing (15 June) we are rapidly approaching the midpoint of the year, which is an appropriate time to look back for a moment at our safety performance thus far in 1972, gauge it against previous periods, and reestablish our goals.

For the first 47 days of 1972, TAC was accident free. Two accidents were recorded in the last few days of February and two more during March for a first quarter total of only four — a real commendable start.

However, we haven't done so well since. Four accidents occurred in April, seven in May (the worst month since May 1970), and three more through the first half of June.

This total of 18 accidents represents a major setback to the steadily improving record this command has maintained during the past four years. While trends, rates, and statistics are frequently uninteresting and often misleading, they can reflect some very significant information. There is no need to load this halfway look with graphs, charts, or statistical tables. The few figures below present a clear picture.

	Through 15 June	
	1971	1972
Major Accidents	8	18
Aircraft Destroyed	5	18
Fatalities	4	25

Although the number of accidents represents a significant departure from the past, the cause factors do not. About 40 percent are attributable to pilots and supervisors, about the same percentage to material and maintenance (mostly material), and the remaining one-fifth to other causes.

The number of aircraft destroyed in relation number of accidents indicates that the 1972 accidents have been more serious. That number is also aided by an increase in midair collisions.

Of utmost concern regarding the few figures shown is the one reflecting that 25 crewmembers have lost their lives in TAC accidents since 1 January 1972. Last year at this time only four crewmembers had been lost in accidents. While four is too many, 25 is shocking.

Eleven crewmembers have been lost in C-130 accidents, eight in F-4s, four in a C-47, and two in an A-37. Midairs claimed seven and, although the final determination has not been made, it appears that out-of-the-envelope ejections have accounted for three and probably more.

To continue this examination of the 1972 record to date, let's briefly review the accidents.

C-130/T-37 — A midair occurred between a TAC C-130 practicing instrument approaches on a training sortie and a transient ATC T-37 entering the landing pattern. Several factors contributed to the collision but the most important was the failure of the "see-and-avoid" concept. Five crewmembers in the C-130 were fatalities; the T-37 crew ejected successfully.

A-37 — The aircraft was number two in a two-ship formation. During joinup shortly after takeoff at about 1500 feet AGL, both engines flamed out due to a undetermined fuel system problem. A restart was attempted then an ejection at low altitude was attempted. Neither was successful. The two crewmembers were fatalities.

C-47 — During the takeoff portion of a touch-and-go directional control of the aircraft was lost. It veered across the airfield, struck a covered concourse adjacent to the terminal building, and burned. All four aircrewmen were fatally injured.

A-7 — While climbing through 6000 feet the pilot noted a slight vibration in the aircraft. After leveling at 8500 feet and reducing power to 85 percent, he observed an oil pressure fluctuation. Shortly afterward the oil pressure dropped to zero and the engine RPM decayed slowly. An airstart attempt was unsuccessful and the pilot ejected successfully at 2000 feet. The high pressure turbine spacer failed due to mechanical fatigue.

AT-33 — While rolling in for the third pass on a ground attack mission, the pilot lost control of the aircraft and ejected successfully. During previous passes he had experienced control problems, probably due to a tip tank fuel imbalance, but failed to communicate his problem and elected to continue the mission.

F-4C — During the roll in for the first hot, low angle strafe pass, the aircraft was observed to assume a

~~se low attitude with 60-70 degrees of bank. Correction 'd not be made and the crew ejected. The WSO ~vived but the student AC suffered fatal injuries. Investigation into this accident is continuing.

F-111 — During his first transition flight the student aircraft commander was practicing a roll (rudder only) during slow flight under the supervision of an IP. The aircraft became uncontrollable and the crew ejected successfully. The investigating board listed the cause as supervisory factor in that the IP directed the student to place the flight control system switch to the takeoff and land position and to perform a maneuver in a flight regime other than that for which takeoff and land mode was intended.

F-4D — The aircraft was to be number two in a four-ship simulated ordnance delivery mission; however, due to a late takeoff, the mission was changed to a single-ship training mission. Approximately 30 minutes after takeoff, the aircraft crashed unobserved. No radio transmissions were heard. Indications are that the WSO initiated sequenced ejection but at an altitude too low to permit complete functioning of the equipment. Both crewmembers were fatally injured. Investigation into this accident is continuing.

F-4D — While crossing to the inside during a turn, the number two aircraft in a flight of two impacted the ~ound. No ejection was attempted; both crewmembers ~e fatally injured. The investigation board determined ~at the pilot, while attempting to fly formation, flew his aircraft into the ground.

F-4E/F-4E — During a four-ship ground attack mission numbers three and four collided during the base-to-final turn. The aircrew in number three ejected successfully with both crewmembers sustaining back injuries. The crew of number four was fatally injured; no ejection was attempted. The accident aircraft were performing different weapons delivery events simultaneously.

AU-23 — During pull up from a hot rocket pass the pilot applied power but the engine did not respond due to an undetermined cause. While zooming the pilot tried a restart without success. He set up for a forced landing in a clear space but impacted a tree short of the clearing. The pilot sustained minor injuries.

F-4E/F-4E — A flight of four had split into two two-ship elements for recovery at home base. Maneuvers directed by a combination of center and approach control placed the two elements at the same altitude on a head on approach. The number two aircraft in each element collided. One of the aircraft became uncontrollable and the crew ejected successfully. The other aircraft lost the outboard two feet of the left wing and recovered safely. ~he board determined the primary cause to be air traffic control.

F-4E — During a formation landing the number two aircraft touched down with the left main wheel on the left edge of the runway. The left gear struck the BAK-12 barrier deck sheave assembly and a go-around was accomplished. While on downwind the remainder of the left main landing gear fell from the airplane. With two remaining gear down, the IP landed the aircraft on an alternate runway. No injuries to the crewmembers resulted.

F-105D — On landing roll the left main gear collapsed due to a material failure of the torque arm knee pin nut in the left main gear assembly. The aircraft slid to a stop igniting fuel from the 450-gallon left inboard tank. The crew egressed uninjured and the fire department quickly suppressed the fuel fire; however, a small fire under the left wing persisted. Approximately eight minutes after the fire department arrived the AGM-45 warhead located on the left side of the aircraft detonated. Shrapnel and blast damage caused a total of 18 casualties (six fatal, four major, eight minor injuries).

A-1E — On a go-around at approximately 500 to 700 feet the engine began backfiring and losing power due to a probable materiel failure. Both crewmembers extracted successfully with no injuries.

F-4E — The aircraft was number three in a five-ship air demonstration formation. During a climb materiel failure caused the aircraft to suddenly pitch up and go out of control. The pilot ejected successfullv but was fatally injured on ground impact after his parachute canopy was burned away by the fire from the aircraft wreckage.

C-130E — During the turn out of traffic after a series of touch-and-go landings, the aircraft was observed to drop suddenly and impact the water. Six crewmembers were fatally injured. Investigation is in progress.

F-111F — At press time for this issue, information was received reporting the loss of an F-111F due to inflight problems. The crew egressed satisfactorily.

This halfway look does not present a rosy picture. Not since 1962 have so many aircrewmembers lost their lives in TAC aircraft accidents during a similar period. In aircraft losses, 18 aircraft have been destroyed, compared to five at this point in time last year. The increase in accidents is obvious. Equally as obvious is a need for improved safety performance.

It's time for individual and collective introspection; time to determine the weaknesses and fix them. If there's an educational gap, fill it. If there's a hazard, find it, report it, and correct it.

We must all pull together to reduce the accident potential and make the second half of 1972 far better than the first half.

Eliminating accidents is something we can live with. ➤

THE HIGHLY PROPORTIONAL HSI

by Capt Curtis A. Routhey
3650th SS/DODA, Columbus AFB, Mississippi

As a pilot you are concerned with the practical side of navigational problems. To help solve some of these problems, some new techniques can be applied to the HSI with relative ease. Let's take a look at some of them to see how it can be done.

LEAD POINTS FOR TURNS OTHER THAN 90 DEGREES

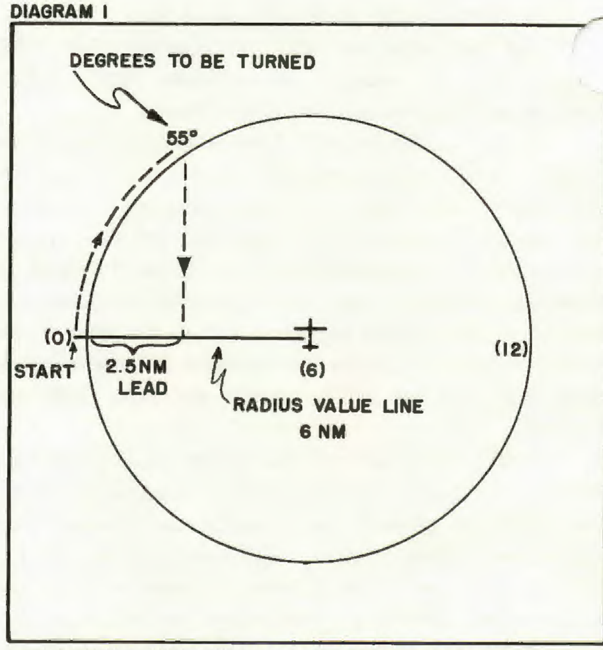
Most turns, while on instruments, are conducted at 30 degrees of bank. Because of this, most experienced pilots are able to approximate their aircraft turn radius. However, this method is hinged to the pilot's judgment, skill, and experience. Several aids (crutches) have been developed to supplement the pilot's judgment. Of these, two formulae were developed to help the pilot compute a 30 degree bank turn radius: 1% of ground speed or Indicated Mach No. (IMN)–2. Your aircraft's performance will determine which one you use. For the purpose of this article, IMN (x10)–2 will be used.

At .8 IMN the turn radius will be 6 NM (.8 x 10 – 2 = 6). For a 90 degree turn, this 6 NM figure is the lead point. When turning from a radial to an arc or from an arc to a radial, this works fine, but what about turns other than 90 degrees?

The following diagram and explanation will demonstrate a method to proportion the lead point using the HSI.

The outer edge of the compass card (Diagram 1) represents the turn circumference while the miniature aircraft is in the center of the turn. The turn radius is represented by the distance from the miniature aircraft to the edge of the compass card. We'll call it the radius value line. The position at the start of turn is at the left wingtip marker. Now that we have the parts labeled, let's see how to use them.

DIAGRAM I



LEAD POINTS FOR TURNS OTHER THAN 90 DEGREES

Let's assume, again, that .8 is the IMN which gives us a turn radius of 6 NM and is the number we apply to the radius value line. For the example, we'll assume that we want to determine the lead point for a heading change 55 degrees.

From the starting position at the wingtip (Diagram 1), proceed toward the top and along the edge of the compass card the number of degrees to be turned (55°). From this point, drop straight down and intersect the radius value line. Next, estimate the distance from the starting point to the intersection and proportion this distance against the radius line value to find your lead in NM. This lead value can be used as is when intercepting an arc from a radial or converted to degrees to intercept a radial.

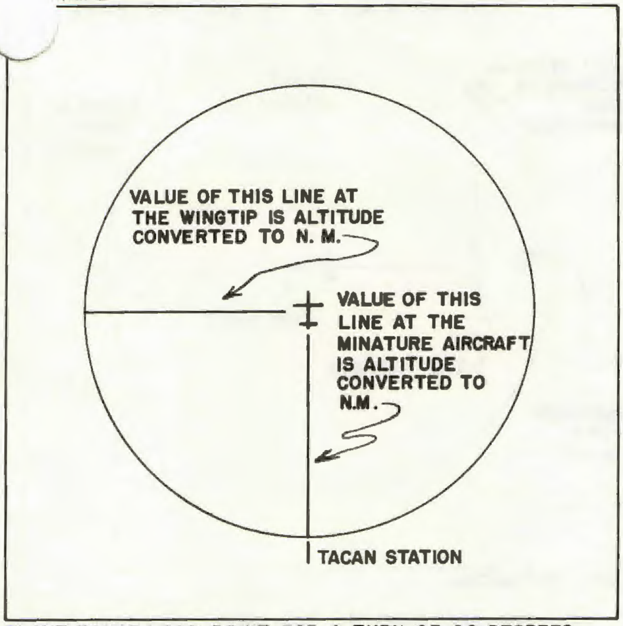
TURN SHORT OF THE STATION TO ROLL OUT ON COURSE

Turning short of the station is another method gathering dust. A two step cleaning effort enables it to be applied to the HSI also. Brush up on your fix-to-fix procedure, then bring it and your calibrated eyeball to the following diagrams and explanation.

STEP ONE – DETERMINE THE SLANT RANGE LEAD FOR A 90 DEGREE TURN:

The miniature aircraft (Diagram 2) represents your flight level converted to NM. The TACAN station is located at the lower lubber line.

DIAGRAM 2

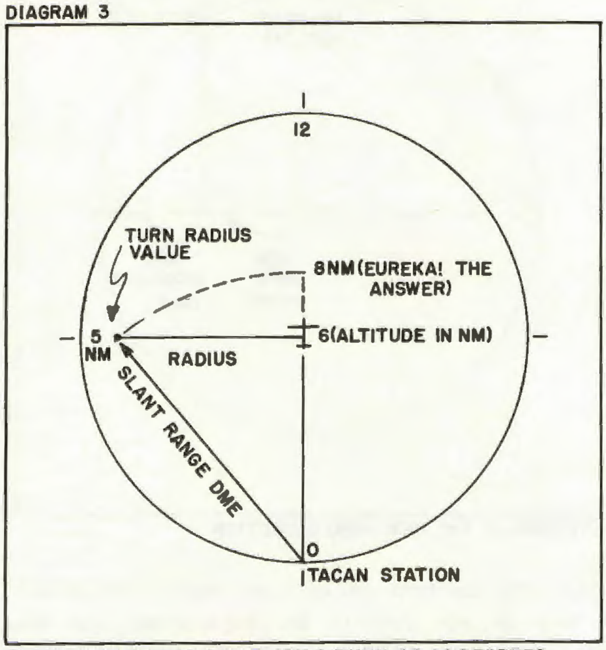


SLANT RANGE LEAD POINT FOR A TURN OF 90 DEGREES

Your turn radius is somewhere along the line from the miniature aircraft to the wingtip marker, proportional to your altitude in NM. (Note: The value at the wingtip marker will coincide with your altitude converted to NM.)

Okay, let's see if we can clear the water by using a specific example (Diagram 3). You are flying at FL 360 which converts to 6 NM straight up. Your IMN is .7 so

DIAGRAM 3



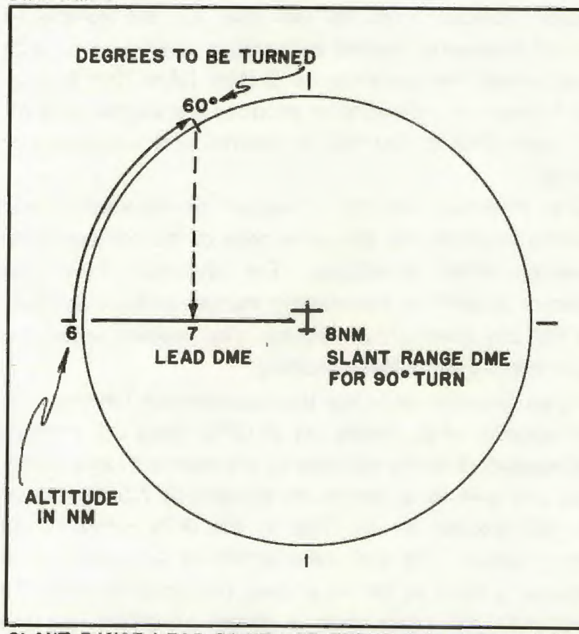
SLANT RANGE LEAD POINT FOR A TURN OF 90 DEGREES WITH THE VALUES IN POSITION

your turn radius is 5 NM (IMN–2, remember?). Place these values in their proper positions, then connect the TACAN station with the turn radius value (5 NM) and eyeball the distance between them. By mentally swinging this line (hypotenuse) up to a vertical position, you can compare it to the altitude scale with your calibrated eyeball to obtain slant range DME. This will be the DME indication at which to start a 90 degree turn. For turns other than 90 degrees, use the next step.

STEP TWO: LET'S USE THE SAME POOP EXCEPT WE ONLY WANT TO TURN 60 DEGREES (Diagram 4):

The minimum DME which the TACAN will indicate if you were to pass directly over the station is your altitude in NM (6 NM at FL 360). Locate this value at the wingtip marker zero turn position. The slant range DME for 90 degrees of turn that we figured out in step one is located at the miniature aircraft (8 NM) and the line between the two is proportional to those values. Now proceed toward the top and along the edge of the compass card the number of degrees to be turned (60°). Next, drop straight down and intersect the value line and proportion off your lead DME (7 NM). You'll roll out on course every time. (Slick, huh?)

DIAGRAM 4



SLANT RANGE LEAD POINT FOR TURNS OTHER THAN 90 DEGREES

This two step technique should eliminate the mental mathematics. It is fairly simple and complements normal TACAN procedures. There is also a rule of thumb which you may find helpful in computing a lead point for a

The Highly Proportional HSI...

turn-short-of-the-station-problem. It goes something like this: Convert your altitude to NM and add 1, 2, or 3. This will give you the DME lead point for turns of 45, 60, and 90 degrees, respectively. This is not quite as accurate as the HSI method, but at least it gives you something more than guesswork. New techniques are not difficult in themselves — the English language just seems to make them so.

WIND DRIFT COMPUTATION

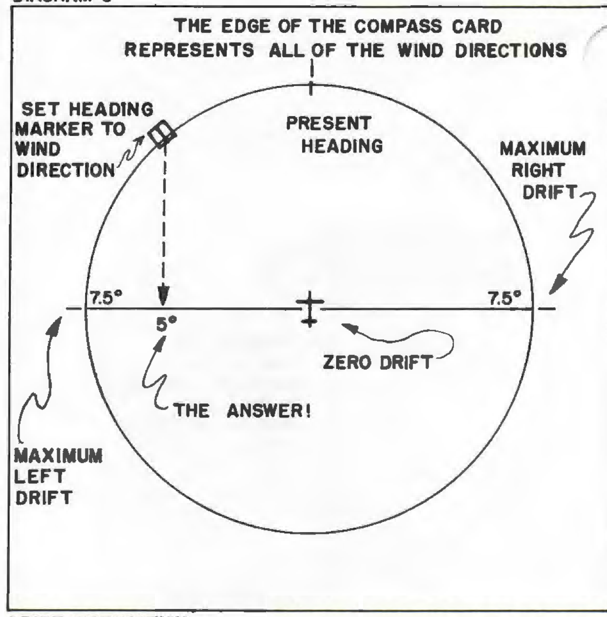
Just getting on course is only a small part of the problem. If it's worth getting there in the first place, then it's worth staying there. If you don't have a navigator, doppler, or some such on board, how do you make a good initial drift correction to stay on course? Do you have a method other than just waiting to see how far you drift off, or guessing at the correction? If not, here's a technique that may be of benefit to you.

Drift estimation is made easier by the new mach number rule in AFM 51-37, pages 11 — 39. The new rule is: mach number times ten will give you the number of knots of crosswind needed to produce one degree of drift at that speed. For instance, at .8 IMN (.8 x 10 = 8), you need 8 knots of crosswind to produce one degree of drift. Let's apply that to the HSI to determine the drift on any heading.

The miniature aircraft (Diagram 5) represents your aircraft's position and the outer edge of the compass card represents wind directions. The distance from the miniature aircraft to the wingtip marker is the maximum drift for any given wind velocity. The heading under the lubber line is your present heading.

As an example, let's say the weatherman forecasts the wind velocity of 60 knots. At .8 IMN, using the formula we discussed, 8 knots will give us one degree of drift so 60 knots will give us a maximum amount of 7.5 degrees of drift (60 divided by 8). This is the drift value at the wingtip marker. The drift value at the miniature aircraft is 0 because a head or tail wind does not produce drift. To figure drift for other than a direct crosswind, set the heading marker to the wind direction. Then intersect the drift value line and read off the drift for your present heading. Check the results on your E6B computer and you'll find that you're within a degree of your quickie comp. In this way, you can rapidly figure drift after any heading change.

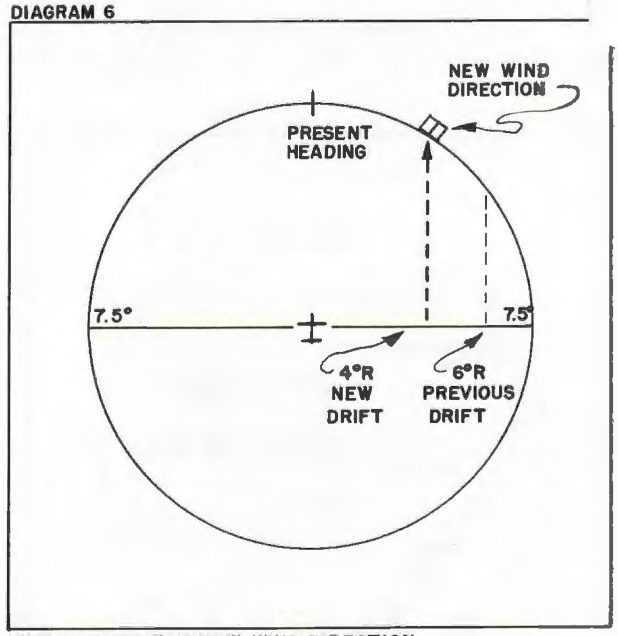
DIAGRAM 5



DRIFT ESTIMATION

You can also find the new wind direction if you assume that its strength has not varied greatly from that which was forecast. Say you are flying cross-country and the drift necessary to stay on course changed from 6R to 4R. By working the steps backwards, you can find the wind's new direction (Diagram 6).

DIAGRAM 6



DETERMINING THE NEW WIND DIRECTION

The HSI can help you with any navigational problem as long as you dare to be proportional. Use your imagination; see what you can do with it. Happy on-course navigation. ➤

TAC/ANG/AFRES Advisory Safety Council

Back in May more than 75 safety representatives from TAC gained Air Force Reserve and Air National Guard units met at Langley AFB for the annual TAC/ANG/AFRES Safety Advisory Council. This marked the first time that AFRES representatives had participated and was also the first time that the Council was held at TAC headquarters.

The Council had a threefold purpose:

- To increase the effectiveness of the accident prevention program by identifying problems and making recommendations to the responsible action agencies.
- To provide an opportunity for personal contact between those agencies responsible for the management of the safety program.
- To provide an environment designed to encourage frank and productive exchanges of experience and ideas for problem solutions, program improvements, mutual understanding, and policy adjustments.

General Momyer provided the opening impetus as he addressed the full body of the Council. He said, "Because limited number of first line active duty resources, we nore dependent upon reserve forces now than ever ore. Therefore, you will be responsible for a greater share of the defense posture in the future than in the past." Later in his remarks to the group, he stated, "You have the inherent responsibility that I have for the management and protection of your resources to get the maximum use from them. Effective use of resources is necessary to allow us to modernize your equipment."

"You have the inherent responsibility that I have for the nagement and protection of your resources . . . "

After the TAC Commander's presentation, speakers from the TAC Office of Safety presented short briefings outlining safety division responsibilities and the means by which the headquarters safety staff could help solve the safety related problems within the ANG and AFRES.

During the second day the Council split up into groups, based upon particular airplanes, problem areas, or specific systems, to conduct panel discussions and to develop recommended courses of action to solve identified problems. On the fourth day the Council president, Major John M. Marvin of the 162 Tactical Fighter Training Group (ANG), Tucson, Arizona, reconvened the Council in full body and the minutes of the Council were submitted, discussed, and approved. A few closing remarks were presented by Colonel Gerald J. Beisner, TAC Chief of Safety. Major Marvin was then called to the front again and Colonel Beisner presented him with the Flying Safety Officer Award.

Colonel Gerald J. Beisner, TAC Chief of Safety, presents the Flying Safety Officer Award to Major John M. Marvin.

It was a productive session with many problems solved and decisions made. Lt Col John J. Cottingham, Assistant Chief of Safety for Reserve Forces, was responsible for arranging the meeting. He reports that details of the activity should be in the hands of safety officials later this month in the form of official minutes. If you are involved in Reserve Forces safety and missed the Council this year, plan early to make it next year. You won't regret it! ➤

WHAT IS IT?

A year or so ago a change appeared in the C-130B Dash One which contained a few instructions in Section 4 concerning something called TALAR. Then a few months later some TAC C-130s (E models) began coming back from Depot mod with a new face plate on the flight director instrument selector control panel. A new position had been added for the flight director mode selector switch and labeled TALAR. Interests were now sufficiently aroused and many pilots began devouring the poop in the good book only to come away unsatisfied. True the book gives the range as 10 NM in the rain and 28 NM in clear weather, but from what? And the book also says that TALAR is flown using the pitch and bank steering bars like an ILS but is it an ILS? In addition the Dash One says that to place the unit in operation merely select TALAR with the flight director mode selector switch. How about the frequency, where do you dial it in? Questions, questions – how about some answers.

First the word TALAR. The letters are an abbreviation for Tactical Landing and Approach Radar. But don't let the word Radar mislead you. It's not radar in the traditional sense with scopes and the like, rather it operates on a radar frequency transmitted from the ground. You may also hear TALAR referred to (especially in maintenance publications) as the Tactical Precision Approach System.

By whichever name is used, it is, in essence, a suitcase ILS system developed for use in forward areas and unsophisticated airstrips. Development of the system stretches back to before 1966 and airborne testing of the system by the Flight Dynamics Lab at Wright-Pat began in 1967. Then TALC (Tactical Airlift Center) at Pope AFB got ahold of it for Category III testing in 1968 and finished the test in 1969. Then came a joint AFCS Category III TAC OT&E which was completed in the spring of 1970. The system is operational in SEA and will soon see service in TAC.

OKAY, WHAT IS IT?

TALAR is a portable instrument approach and landing system which consists, basically of a ground transmitter (AN/TRN-27) and an airborne receiver (AN/ARN-97). The ground unit transmits a signal similar to that transmitted by a standard ILS. The airborne unit receives the signal and provides analog output proportional to glide slope and localizer deviation. This signal dr[illegible] the conventional cross-p[illegible] indicator of the flight dire[illegible] computer.

THE GROUND EQUIPMENT

The ground equipment consists of a 50 pound tripod mounted transmitter with a power source of either 24V DC, 28V DC, or 115V AC, 60HZ. During the tests a standard Combat Control Team Jeep battery provided sufficient input power. The transmitter can be set up by two men in approximately five minutes. The glideslope can be adjusted from 2 degrees to 6 degrees by means of a borescope sight. The transmitter has a power output of 10 watts minimum and operates on a frequency of 15.5 gHz. It transmits four time-shared beams of microwave energy. These beams operate in two pairs: an up-down pair for glide slope and a left-right for localizer. The crossover of a two paired set of beams def[illegible]

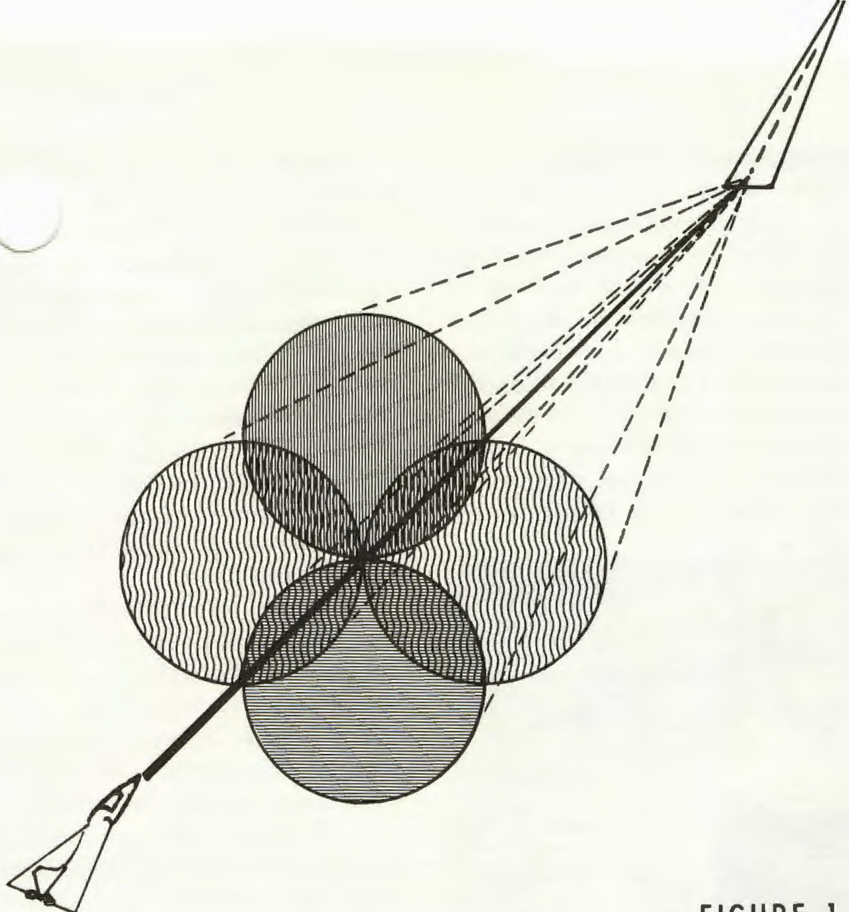


FIGURE 1

the glide slope and the localizer course (Figure 1). This differs basically from the conventional ILS system which employs two separate transmitters, one located at the far end of the runway which radiates localizer information, and the other positioned to one side of the runway for glide slope information. The TALAR transmitter is positioned on runway centerline near the runway threshold (approximately 300 feet prior to the runway and on the extended runway centerline).

THE AIRBORNE EQUIPMENT

The airborne equipment consists of two black boxes with a combined weight of just over 5 pounds. One black box contains the receiver and horn-type antenna. Due to its small size and weight (2 pounds) it can be installed just about any place where the antenna horn gets an unobstructed forward view and is generally aligned with the longitudinal axis of the aircraft. The amplifier, which is the other black box, need not be collocated and presents no particular mounting problem because of its small size and weight.

The receiver is pre-tuned and requires no frequency selection by the pilot (therefore none is provided). All TALAR transmitters and receivers will operate on the same frequency. The airborne equipment will process the electronic information by comparing the relative amplitude of energy received from each of the two pairs of beams. The comparison of this relative amplitude will be a measure of aircraft displacement relative to beam intersection and will be displayed to the pilot through the conventional crosspointer indicators, such as, glide slope indicator, localizer displacement on the HSI and pitch and bank steering bars (Figure 2).

Sounds pretty good doesn't it? But, as with everything, there are a few thorns in the bed of roses.

The first one is: we don't got it yet. While the combat control teams have (or soon will have) the necessary ground equipment and are being trained in its use and the airlift wings have ordered the necessary maintenance stuff, the airplanes aren't ready yet. That position on the flight director mode selector switch which announces loud and clear, TALAR, is as dead as last night's cold duck.

The hold up is in the procurement of the "A" kit for the TCTO (1C-130-820), which consists of wiring, shock mounts, and so forth. The "B" portion of the complete package, which is the receiver/antenna and amplifier is already on hand. It

TALAR BEAM PATTERN

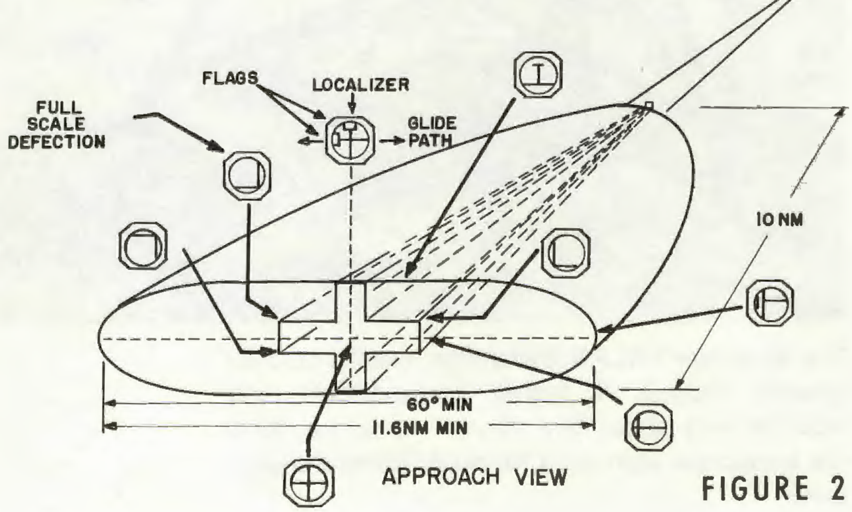


FIGURE 2

TALAR - WHAT IS IT?

appears now that the complete kit (combination of A and B) won't be ready until 1 November at which time 100 kits will become available and 15 January at which time the remainder will be on hand. Also the TCTO was originally to be accomplished at the depot level, but will now be done at the organizational/field level.

The second thorn is that air operational procedures for the use of TALAR have not yet been developed. However this problem is on its way to resolution. Procedures are being developed and will be included in a forthcoming change to TACM 55-130 (to be published sometime in the fall). These procedures will have to include means to take up the slack in the shortcomings of the TALAR system such as:

The complete TALAR transmitter weighs only 50 pounds making it highly transportable and requires only about five minutes to set up. Note the borescope sight used for establishing the glide path.

- No initial approach fix/final approach fix navigational [illegible] provided in the TALAR g[illegible] equipment. Consequently, as in a conventional ILS, a means will have to be employed to acquire the signal. The use of a radar beacon transmitter, portable TACAN, radio beacon, or some other means will have to be provided in order to give the pilot a way to capture the TALAR signal. Crew coordination will play a bigger part than ever in navigating to the final approach course.
- Since all TALAR ground transmitters will operate on the same frequency special attention will have to be directed to the placement of the transmitters at different airfields in relation to one another. The results of inattention in this area are obvious.
- There is no aural means to identify the transmitted signal. Some other means will have to be used to insure that the right one is the one you got. Again, an outer marker, radar beacon, etc., will have to be used.
- The approach beam beco[illegible] more sensitive to fly during the last two miles because the transmitter is located short of the runway as opposed to conventional ILS where the localizer transmitter is located at the far end of the field. Minimums will have to be established taking into consideration the approach aids available, the absence of course guidance during a missed approach, the absence of a middle marker, and the approach beam sensitivity.

There's a lot of work yet to be done to make the TALAR system completely workable, but there's no doubt that the addition of the system will give us a precision approach capability into austere airfields that is sorely needed. One has only to remember such names as Khe Sanh, Kham Duc, An Loc, An Khe Golf Course and many more, to applaud the addition of TALAR. ➤

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TAC TALLY

MAJOR ACCIDENT RATE COMPARISON

	TAC		ANG		AFRes	
	1972	1971	1972	1971	1972	1971
JAN	0	1.6	0	16.7	0	0
FEB	0.8	1.6	0	11.6	0	0
MAR	1.6	3.1	6.3	7.0	0	0
APR	2.8	2.7	8.1	4.9	0	0
MAY	4.0	2.5	6.4	5.7	0	0
JUN		2.6		6.9		0
JUL		2.9		7.1		0
AUG		2.7		7.8		2.7
SEP		3.2		7.4		2.4
[illegible]		3.2		6.9		2.1
NOV		3.3		6.9		2.0
DEC		3.2		6.4		1.8

AIRCRAFT ACCIDENTS

UNITS

	THRU MAY			
	1972		1971	
	ACDTS	RATE	ACDTS	RATE
9AF	3	2.8	3	2.8
1 TFW	1	6.5	0	0
4 TFW	0	0	0	0
31 TFW	1	9.9	1	10.4
33 TFW	0	0	0	0
68 TASG	0	0	0	0
316 TAW	0	0	0	0
317 TAW	0	0	0	0
354 TFW	1	9.7	0	0
363 TRW	0	0	0	0
4403 TFW	0	0	2	29.0

	THRU MAY			
	1972		1971	
	ACDTS	RATE	ACDTS	RATE
12AF	7	3.7	2	1.3
23 TFW	1	12.5	0	0
27 TFW	1	10.6	0	0
35 TFW	1	7.1	0	0
49 TFW	2	15.7	0	0
58 TFTW	1	4.3	1	4.5
67 TRW	0	0	0	0
71 TASG	0	0	0	0
313 TAW	0	0	0	0
314 TAW	0	0	0	0
355 TFW	0	0	0	0
347 TFW	0	0	0	0
474 TFW	1	6.7	0	0
516 TAW	0	0	0	0

TAC SPECIAL UNITS

	1972 ACDTS	1972 RATE	1971 ACDTS	1971 RATE
1 SOW	1	4.3	2	7.3
2 ADG	0	0	0	0
57 FWW	0	0	0	0
4410 SOTG	2	15.1	0	0
4485 TS	0	0	0	0
4500 ABW	0	0	0	0

SUMMARY

TAC MAY 72	TAC Thru May 1972	TAC Thru May 1971		ANG MAY 72	ANG Thru May 1972	ANG Thru May 1971
7	21	13	TOTAL ACCIDENTS	0	9	7
7	15	8	MAJOR	0	7	6
4	18	5	AIRCREW FATALITIES	0	1	2
7	15	5	AIRCRAFT DESTROYED	0	6	5
6	15	4	TOTAL EJECTIONS	0	5	4
6	11	4	SUCCESSFUL EJECTIONS	0	5	3
100 %	73.3%	100%	PERCENT SUCCESSFUL	0	100%	75%


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