AEROSPACE

SAFETY • MAGAZINE FOR AIRCREWS OCTOBER 1980

REQUIEM FOR A HEAVYWEIGHT

THERE I WAS

■ *This is the first response to this feature and it is a classic. It's an example of what can happen when seemingly unimportant things are omitted from our flight preparations. This one we'll title* GET-HOME-ITIS. *An old term we've all heard, many of us have had it, some of us survived, others did not. Read and heed. Thanks.*

We had an RON at an en route base and I, as an FNG, had swapped aircraft with Lead because his bird had intermittent radios. We were anxious to get to our destination and turn the aircraft into the MOD program as we were scheduled to deploy in the immediate future and were in a hurry to catch the transport that would get us back to the squadron.

I preflighted both aircraft while he went to Ops to file our IFR flight plan. Unknown to me, he changed the route of flight to avoid a line of TSTM that lay along our planned route of flight. He got the clearance over the radio using ground power (only one ground unit was available) because we had a final leg that stretched our fuel and we didn't want to start and use up extra fuel.

After takeoff I was having trouble with my comm and nav radios, so the strange headings we were using just added to my confusion. We were skirting the tops of the TSTM's in the milky stuff at 42M' when my engine unwound to idle, I lost pressurization, and the inside of the canopy iced over. I couldn't maintain position, obviously, so Lead dropped back into a wing position, and we started a glide into the top of the TSTM's. He transmitted "You're in a turn." My gyros looked okay but in the face of the previous electrical problems I lost the faith. "Which way?" and "Roll right!" "You rolled too much – roll left!" With that, the airplane departed controlled flight.

I recovered in the TSTM using needle, ball, altimeter, and airspeed. My radio calls on the last known frequency got no response. My engine was running okay at 21M', but I was lost, in the middle of a TSTM, with (I thought) bad gyros, bad radios, and an unreliable engine. Guard channel got me a GCI to a GCA in ⅛ mile, obscured, 30 kts gusting to 50 with 4 inches of water on the runway and heavy turbulence. That was 27 years ago. My leader dug a hole 42' deep with him still in the cockpit.

I never launched again without everyone in the flight having a *complete* IFR briefing, good radios, good nav gear, and the answer to the question "Does this flight smell of get-home-itis?" ■

This new USAF program is simple and there are very few rules to remember. Basically, we want anonymous accounts of personal errors or mistakes that we can publicize to warn others not to make the same mistakes. The end hoped-for result, of course, is a reduction of our operator factor losses. The form to fill out is the ultimate in simplicity–a nearly blank page on which we have begun the first sentence with "There I was"–the rest is up to the writer. The reverse side of that page is preaddressed to the Director of Aerospace Safety so after the story is told, just fold, staple, and mail. Don't sign or identify yourself or unit– we want total anonymity. I will personally read each account. If considered appropriate, the lesson learned from the account and preventive measures, if any, will be publicized. In effect, save an airplane, save a life, tell your war story to the Air Force through the "There I was" program.

Sample forms were sent to Safety offices in the August issue of the USAF Safety Journal *for reproduction and dissemination locally.* ■

Brig Gen Leland K. Lukens
Director of Aerospace Safety

UNITED STATES AIR FORCE

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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THEY WALKED AWAY
F-4 Emergency Evacuation Procedures

By CAPTAIN SKIP BREMER
27TASS
Davis-Monthan AFB, AZ

■ **In this article written for the McDonnell Douglas *Product Support Digest,* Captain Bremer discusses "BOLD FACE" procedures for emergency ground egress from the F-4. Air Force experience during the past couple of years underlines the importance of all aircrews having these procedures down letter perfect.**

All of us who fly the F-4 know that it has an impressive ejection record; and because of this we probably do not concern ourselves with the particulars of that system as much as the crews of "Brand X" aircraft. Our faith in the reliability of the fine product of Messers. Martin and Baker gives us much comfort, but can we say the same for the "other" egress system in the Phantom – the one that gets us out when we don't want to use the super rocket assist?

Recently there has been an increasing number of emergency ground egress experiences that have not gone as smoothly as one would have liked. We have been hearing such after-the-fact comments as . . . "I forgot about the sticker clips." "I got stuck in the %$#&*#%$ restraint lines!"

I personally would not want to find myself in one of the above situations if I were trying to "get out of Dodge." I'm sure that you all know the BOLDFACE procedures by heart, but do you also know what each step really accomplishes as your heart is pounding and you're fighting off that panicky feeling? Let's examine the emergency egress procedures, one-by-one, to see what's behind the required actions.

1. LOWER GUARD – UP
2. SHOULDER HARNESS – RELEASE
3. INSIDE HANDLE – ROTATE AFT
4. OUTSIDE HANDLE – LOCK UP
5. Canopy – OPEN

Even though the wording has changed over the years, the intent has remained the same – five quick steps and you're out. I won't spend any time on the fifth step here only because there have been few problems with the canopy itself. Of course you all realize that it is a rather important step in evacuating the aircraft. These first four steps give you a shortcut in exiting your Phantom, since by my count, the normal method requires at least eight to ten different movements.

1. LOWER GUARD—UP

This is the guard for the lower ejection handle, located on the forward edge of the seat bucket, which prevents inadvertent operation of the handle. You may have thought that this was accomplished by "hiding" the handle opening from your fingers, but actually it has an internal mechanical lock that prevents the handle from becoming unseated. This is a pretty good first step because if you accidentally pulled the handle, or kicked it up, or got it tangled in the leg restraint lines, you could find yourselves leaving the aircraft much faster than anticipated. If you decide to get out of the airplane prior to takeoff, there is a good chance that this guard will already be up.

2. SHOULDER HARNESS —RELEASE

There is no mystery to this maneuver – you can't very well leave the Phantom if your parachute is still attached, unless you take the entire seat with you. And remember there are two of these releases, so missing one of them is like forgetting both of them. Here's a technique you may want to use: Lean forward slightly to put pressure on the straps (it helps to have your reel locked), then take each hand and point it at its respective release (left hand for left release, right for right) with the fingers together. Starting with the forefinger, raise the hands in a sweeping motion up under the top outer latch piece. The forefinger should catch the latch (if it doesn't, the middle finger will) and push the latch up. Now bring the fingers down and your middle finger should hit the bottom latch. It takes only a little movement of the bottom latch to release the shoulder straps, especially if you've kept the pressure on them by leaning forward. Now you have just two quick moves to go.

3. INSIDE HANDLE —ROTATE AFT

This is the survival kit release handle, the yellow one closest to your right knee. Simply grab it with your right hand, pull it up and back until it separates from the seat, and toss it. When you do this, you release the survival kit restraining straps on either side of you, allowing the kit to remain in the seat when you stand up. Before you stand up, there is one more essential step.

4. OUTSIDE HANDLE —LOCK UP

This is the emergency harness release handle located just to the right of the survival kit release handle. To actuate the handle, just squeeze the trigger and pull the handle aft until it locks in the up position. This action releases the lapbelt and leg restraint locks, allowing the garter retraction lines to be spring-ejected from their locking receptacles. (When used in-flight for manual seat separation following ejection, this handle triggers other actions, one of which you will probably notice now.) The parachute restraint lines are released, allowing the parachute pack to drop slightly and push against your upper back. While this may distract you, it should not hinder you in your escape.

UP and OUT

After opening the canopy (Step 5), stand up briskly so that the sticker clips will release easily. A properly attached and tightened kit aids in a direct, low-force separation of the sticker clips. Now before you arbitrarily decide to launch out of the cockpit, take the time to raise first one foot and then the other onto the survival kit to check that the leg restraint lines have not become entangled.

If you are in the back seat, finding the safest wing to exit over is probably your best bet, but take your time to be safe rather than sorry.

From the front seat, sliding over the front glass and off the left side of the radome should be as safe as any maneuver, as long as you keep in mind just how far off the ground you are. Remember that the AOA probe and the pitot tube are just waiting to catch you, as is the ladder in the fighter models.

The best way to make this ground egress procedure work is with practice; and you are fortunate to have several avenues of practice available to you. The next time your friendly Life Support Officer says your time has come, take advantage of it— practice the egress procedures. You also have an opportunity to practice every time you visit the beloved simulator; after all, you don't want to stay in there forever.

In case you haven't already guessed why the ground egress system isn't as reliable as the ejection system, it is because of the built-in human factor associated with ground egress. It's hard to really practice the ejection procedure, but when working correctly, it's all automatic anyway. But Steps 1 - 5 on the ground require human thought and action, and thinking can get us "humans" in trouble every time.

So do yourself a favor by becoming "letter perfect" on emergency evacuation procedures— as the good book says, aircrew members should be able to accomplish BOLDFACE procedures without reference to the checklist. Who wants to read a book while Rome is burning? Having a fire on start means three things to me— Call the crash crew if possible, cut the throttles and masters, and get out NOW! I'm prepared to do these things quickly and smoothly. Are You? ■

NEWS FOR CREWS

Career information and tips from the folks at Air Force Manpower and Personnel Center, Randolph AFB, TX.

FACT VERSUS PERCEPTION – the "Fightergator" enters the 80s

By CAPTAIN JOSEPH H. WEHRLE, JR.

■ Let's see if I can put it all together. You work for an employer who's searching for an automated system to make your job obsolete. He traditionally combines this with somewhat less than optimum career progression, low promotion rates and an overseas assignment outlook that lets you claim dual citizenship. Sound familiar?

If you're a WSO (Weapon System Officer) in today's fighter force, it should! It's the popular version of a WSO's career and resulting life style – you and I have heard it, described it, and lived it. How much is truth, how much is perception? Is anyone working the problem, or should we all give up and either quit or accept "the obvious?" Since coming to MPC and taking on "the obvious" face-to-face, I've learned that while some of the WSO's woes have been based on fact, many haven't – and there are some good things happening.

The WSO Career Outlook

Despite what you guys at Nellis or Kadena see happening on the flight line, the WSO career field is far from becoming obsolete. Even with the advent of the single seat fighter, the known dual cockpit inventory decreases by less than ⅓ between 1982 and 1989.[1] Though the specific numbers are classified, a large WSO requirement both in and out of the cockpit will exist through this decade and well into the next.

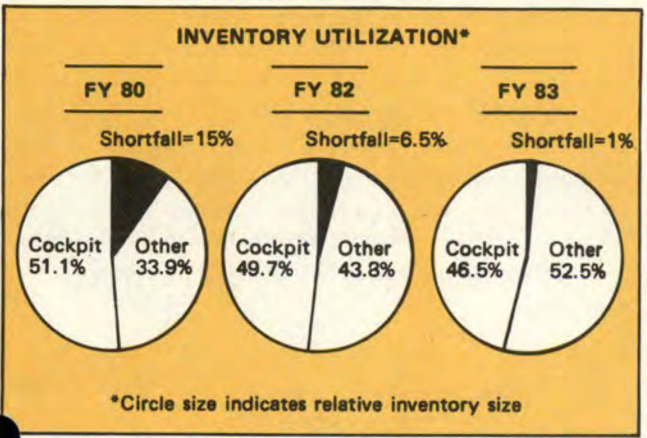
As an offset to this requirement reduction, low UNT rates will keep the WSO inventory in a shortfall situation through 1983, so any WSO who remains on or returns to active duty can be assured of gainful employment. Additionally, future candidates for the two-seat fighter inventory are also being evaluated, but it's far too early to make any guess on exactly what types will be designed, programmed, budgeted, or bought.

Assuming you'll buy my premise that we'll have more jobs than WSOs for some time to come, let's look at what kinds of opportunities we're talking about. Two major trends become apparent as we attempt to analyze a downstream career outlook in terms of what's happening today and what's programmed to happen tomorrow.

[1]FY 82-89 USAF OBJECTIVE FORCE, AF/XOXFI, 15 December 1979, p. 283.

First, operational supervisory positions for WSOs are really beginning to open up. Before you start to laugh and turn the page, let's look at the facts. As recently as five years ago the idea of WSO "operational" progression was absurd. To get promoted, you had to move towards staff or supplement duties – the cockpit was a relative career "graveyard." Fly, get your gates, and depart for the land of the flying desk, MPC told me and others. Raised in that environment, it's not surprising that today's field grade WSOs returning to cockpit duties due to inventory shortages see the move as an abrupt reversal in career progression. They're finding, however, that the situation has changed somewhat for the mid-career WSOs that are greeting them at the squadron door. Title 10 and some very high level emphasis are providing expanded career opportunities, as evidenced by nearly 85 of our best WSOs who are currently flight commanders. On top of that there are currently nine ops officers and seven squadron commanders. Not much when you compare it to the pilot numbers, you say? Give those flight commanders a few years – remember, it was only in 1975-76 time frame that we began to see WSOs in these jobs at all, and effective operational supervisors grow into the jobs. Emphasis for these shifting career patterns comes right from the top – the Chief of Staff has personally pushed it. The real question to be answered is, do we care? Changes like these take time and only our dedicated efforts, confident career oriented attitude and proven performance can accelerate the process or even make it work at all.

The second trend one sees in the WSO career outlook stems from improvements in the ratio of cockpit to staff/supplement jobs available. As nearly any field grade WSO can tell you, a few years ago it seemed to take forever before a WSO could break out of squadron-level duties. This was due to the simple fact that most WSO jobs were in the cockpit. As single seat fighters replace a part of that cockpit requirement, however, the overall requirement structure for WSOs is beginning to take on much better balance. Mid-level (senior captain/junior major) WSOs will find themselves made increasingly available for duties in the staff, supplement, AFIT, ATC, PME, and other areas. The figures below can perhaps best illustrate the trends that will really change our opportunity to career broaden. The "shortfall" shown represents the difference between total WSO requirements and inventory—a shortage that is decreasing as UNT rates begin to increase and the cockpit requirement decreases.[2]



Now that we've discussed both cockpit and staff/supplement career opportunities, let's put the package together and develop possible career patterns. The Aviation Career Incentive Act provides minimum guidelines for the frequency and amount of cockpit duty (in terms of aviation gate months) needed for continuous pay. The main variables in the equation, therefore, are the frequency and amount of time spent in other duties. The optimum job mix is one that provides the best progression opportunity in the sense of career broadening without detriment to viability as a rated officer. This latter measure can be generally defined in terms of flying time and currency, and is vital to an officer's competitiveness for promotion and the better rated jobs at every level, particularly in the fighter arena. Balancing all these variables entails cockpit duty through at least the first aviation gate (72 months) followed by other tours of duty interwoven with at least enough cockpit time to reach the third gate (132 months).

[2]Data prepared by AFMPC/MPCROR 5, 3 June 1980.

Again, the ability for you to plan and realize your desired career pattern depends in large measure on *your* performance—don't expect a high-powered staff job if your cockpit skills are limited or outdated! I know that you've heard it before but I've learned it's true—"your best career development job is the one you have right now." As it is in most instances, the proven performer will continue to be rewarded at the expense of others.

The WSO Promotion Outlook

Promotion opportunity and selection rates are on everyone's mind—primarily due to the '79 and '80 Major's board results. The navigator (especially the WSO) was hit hard—hard enough to send our attrition rates through the mach. Trying to pinpoint the exact reason for the problem is difficult at best, but I've just finished giving it my best shot.

Jumping in the middle of all the published statistics about pilot vs navigator, crew vs staff, OER ratings, PME, advanced education, job title, etc., one point rings clear—the basic decision on whether to promote or not is primarily subjective. "Does this officer have the potential to assume the added responsibility associated with the next grade?" Contrary to what I know many WSOs feel, my homework strongly indicates that the promotion boards have been fair and square, with no discernible bias as to aeronautical rating. Overwhelmingly, the primary indicator of any officer's potential as measured by the board has proven to be the quality and consistency of performance as reflected in the OER.

Digging into the statistics even further shows that with all factors being equal (OERs, PME, etc.), all officers, regardless of wings, get promoted at approximately the same rate. For example, the average pilot and navigator entered the board with about the same level of PME and advanced education. Also, pilots and navigators with the same OER profile got promoted at essentially the same rate. Again, my impression is that the statistics simply don't support any claims about promotion board prejudice.

So why the discrepancy? It's what we suspected all along—the *average* navigator did not enter the board with the same OER profile as the average pilot. For example, on the CY 80 temporary major's board just looking at the final OER written under the controlled cycle for those that were considered for the first time.[3]

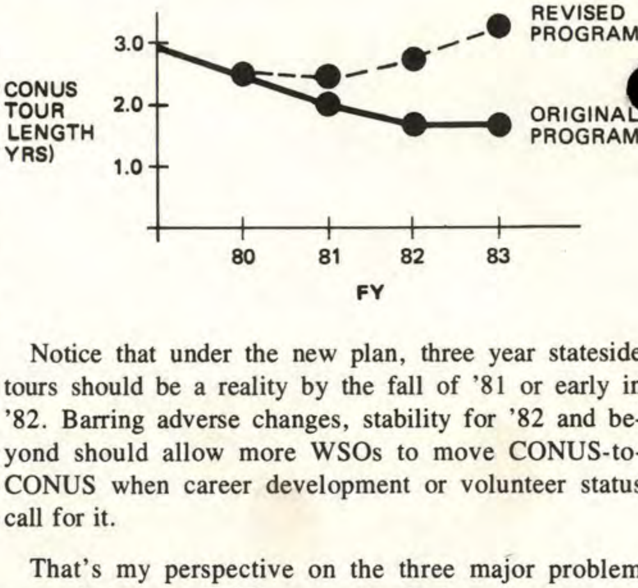
OER Rating	Pilot	Nav
1	33.6%	23.8%
2	37.6%	36.2%
3	28.8%	40.0%

More specifically, under the controlled system, the WSO was in direct OER competition with the *fighter* pilot. On this most recent board, the fighter pilot was promoted at a 5 percentage point higher rate than the non fighter pilot (90.3% vs 85.3%) – nor surprisingly, therefore, the WSO promotion rate was nearly 3 percentage points less than the nonfighter navigator (69.4% vs 72.3%). What's the outlook? Obviously, the navigator (and especially the WSO) must recover from the controlled OER era. Along that line, I've noticed that the further we get into the uncontrolled OER program, more of that recovery is being seen – most probably due to the career development trends that we talked about earlier in the article. How much of a recovery? For new eligibles on the 1979 temporary major board, the selection rate difference between navigators and pilots was 17.2% – on the more recent board, 13.0%, an improvement of 4.2%. It's definitely a start in the right direction toward giving us more than hope that as the ops and staff opportunity increases, the true performer, whether pilot or WSO, will rise to the top.

The WSO Overseas Assignment Outlook

In the mid and late 70's, as the initial F-4 squadrons began to convert, a dramatic and somewhat unexpected change in WSO overseas requirements began to take place. Aircraft and crews from overseas converting squadrons, instead of returning to the CONUS as planned, sometimes remained in theater to supplement or "flesh out" existing forces. CONUS squadrons, however, continued to convert as programmed, reducing WSO strength stateside. Combining this growing overseas imbalance with reduced UNT production rapidly shortened the tour length of the CONUS-based WSO. In fact, as early as 1978, the WSO shop at MPC projected that programmed force beddown plans, coupled with the low proposed UNT output would mean an average WSO CONUS tour length of less than two years by 1981/82.

With the strong support of the TAC commander, a coordinated plan was recently approved by the Air Staff to alleviate the overseas imbalance through increased UNT production and changes in the force conversion schedule. More UNT production was approved, but due to budget constraints immediate increases were impossible. To help us through the 1980-83 crunch period, an increased distribution of the available UNTs was provided to the fighter world at the expense of other MAJCOMs. Without these initiatives, a CONUS tour length of less than two years would be with us today. Moreover, the force conversion plan was significantly changed, reducing the WSO overseas requirement in the 1981-82 time frame. The effect on projected WSO CONUS tour lengths will be dramatic:



Notice that under the new plan, three year stateside tours should be a reality by the fall of '81 or early in '82. Barring adverse changes, stability for '82 and beyond should allow more WSOs to move CONUS-to-CONUS when career development or volunteer status call for it.

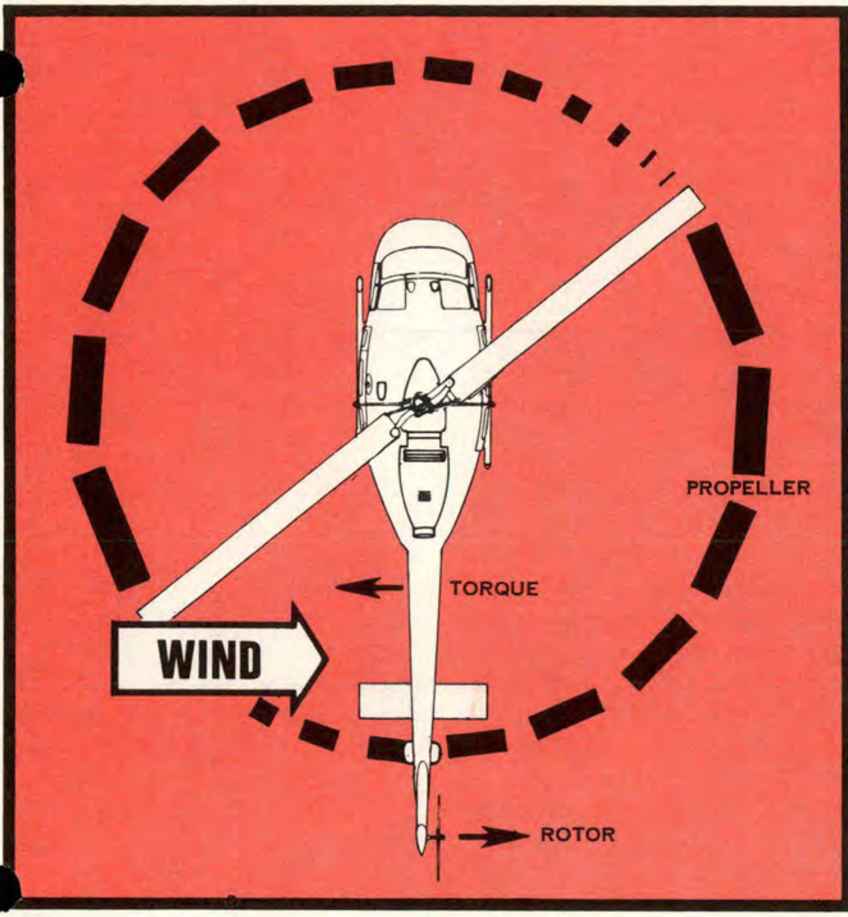
That's my perspective on the three major problem areas facing the WSO – career outlook, promotion opportunity and the overseas imbalance. By looking at the facts, I hope you'll conclude – as I have – that the right problems have been identified; solutions are being worked; and what seemed so "obvious" in the way of real or perceived roadblocks yesterday, is not so "obvious" today. ■

About the Author

Captain Wehrle is a 1970 graduate of the United States Military Academy. He's a career WSO with tours of duty in Thailand, Philippines, Korea, and the CONUS. He has over 1,100 hours in the F-4, and since 1978 has been assigned to the AFMPC Fighter Shop.

[3]Data furnished by AFMPC/MPCY, 1 June 1980.

NOTE: Due to abbreviated and training reports, an individual's last controlled OER may have been rendered in 1976, 1977, or 1978.



By CAPTAIN M. J. T. HEWETSON
Army Air Corps Center
Middle Wallop
Stockbridge, Hampshire
England

Tail Rotor Breakaway

■ "Any helicopter with an anti-torque tail rotor is subject to the possibility of losing total tail rotor thrust for no apparent reason."

When a statement like that is made, hands are thrown up in horror and cries of "nonsense!!" ". . . unprofessional!" and similar euphemisms are heard echoing through the corridors of aviation power. The reason is obvious; poor airmanship and overcontrolling by the aviator can result in running out of left antitorque pedal. This is the normal perception of the intent of the statement. However, we are not considering the problem of not having enough tail rotor thrust. What is being addressed is the sudden and abnormal reduction in thrust produced by the tail rotor accompanied by a rapid and large torque increase, caused by some aerodynamic disturbance. It may occur at "mid-pedal setting"; it is the loss of thrust. For want of a better expression, it can be described as "tail rotor breakaway" or "tail rotor stall."

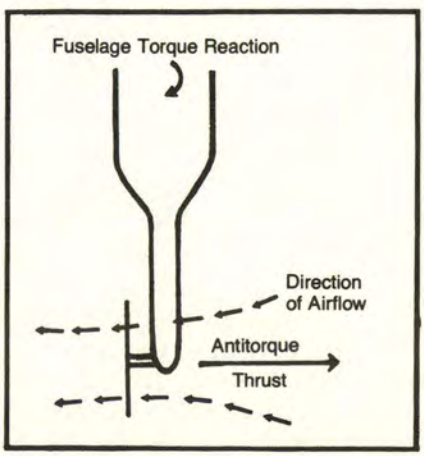
Before studying the conditions required for such an aerodynamic phenomenon, it is worth returning to basics and considering what the tail rotor actually does and how it does it. Let us consider those tail rotors which are mounted on the left, or port side, of the tail boom. From Figure 1 it can be seen that to provide antitorque thrust the tail rotor is a "pusher"; its thrust is against the tail boom and fin. This thrust can be considered in the same way as "lift" is explained for the main rotor, so, as we all know:

$Lift = CL \frac{1}{2} p V^2 S$

Where "CL" is the coefficient of lift, a function of blade design and angle of attack, "p" is air density, "V" is the relative rotational velocity of the blades, and "S" is the surface area of the blades. Any change in any or all of these factors will result in a change in lift, or in this case tail rotor thrust. This basic formula should be borne in mind throughout this study.

The Empire Test Pilot School at Boscombe Down in England made a study of tail rotor breakaway and produced theories for the required conditions; but, as far as prevention of and correction for the

Figure 1



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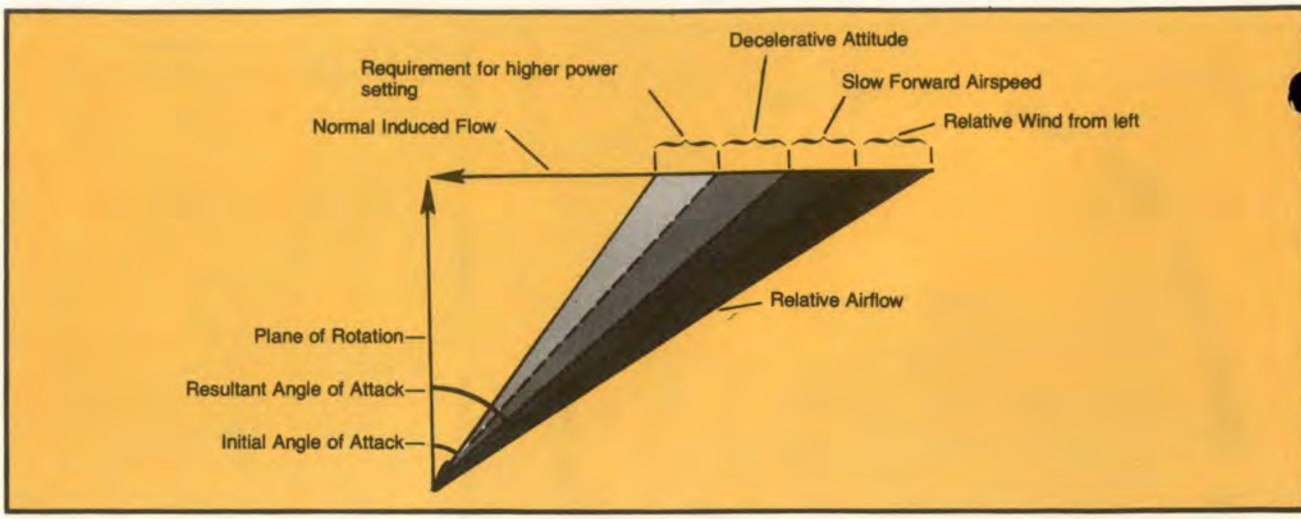


Figure 2

phenomenon, their paper was, at best, scant. It is the purpose of this discussion to recount their theories and, without being too presumptive, to suggest some remedies.

In general there are four conditions associated with tail rotor breakaway. The first condition is that of a requirement for high power. The second is a decelerative attitude, hence slight tail-low attitude. Third, this attitude must be held at a low airspeed. Last, and most controversial, a relative wind from the left of 5 to 12 knots is required.

When considering *high power*, the maneuvers to be considered may be any which require a high power setting resulting in a large tail rotor thrust, therefore a high angle of attack. Such maneuvers could be an approach to a hover, or confined area operations at high gross weight (GWT) or high density altitude (DA), or even nap-of-the-earth (NOE) operations.

A *decelerative attitude* will result in the combination of the downwash from the main rotors being reflected from the synchronized elevator, and a certain amount of turbulence generated by the airflow passing upwards over the elevator. The result is an opposition to, or a disturbance of, the airflow through the tail rotor. Back to basics again, if the airflow is disturbed over an aerofoil, then lift is reduced. Hence, more pitch to the tail rotor blades is required to produce the same antitorque effect. Therefore, a large angle of attack is needed.

At *slow airspeeds* a high power setting is required unless a rate of descent is accepted. The downwash angle of the main rotor is therefore increased. Once again, the airflow through the tail rotor is disturbed further, resulting in the need for a still larger angle of attack.

The last condition was a *relative wind from the left*. Most aviators would state that wind from the left is an aid rather than a limitation to antitorque control. However, in so stating, they are considering the effect of that wind on the tail boom rather than on the efficiency of the tail rotor. If the effect on the tail rotor is examined, it can be seen that such a wind would be in direct opposition to the airflow through the tail rotor. The result is a momentary deterioration of the efficiency of the tail rotor. The combined effect of these conditions can cause the tail rotor to stall, hence the resultant uncontrollable yaw to the right; uncontrollable since if antitorque pedal is applied, then the stall deepens. The tail rotor can be said to "break away" aerodynamically. For those who have a mania for vector diagrams, the combined effects of these conditions are simplified at Figure 2.

In the September 1977 issue of the *U.S. Army Aviation Digest*, there was an article called "How to Crash – By the Book." It depicted an OH-58 Kiowa pilot who was flying NOE in a racetrack pattern downwind, then turning right into the wind, using too much right antitorque pedal. The pilot admitted to a very low airspeed. He experienced a total loss of tail rotor control in the turn. By turning right with too much right pedal, he was in effect forcing the tail to the left, inducing a relative wind from the left. His predicament was never explained. Perhaps if one reviews the conditions described above, all of which were present in this incident, it could be said that this aviator experienced tail rotor breakaway.

It is worth considering another yet allied explanation for tail rotor breakaway. When the phenomenon of settling with power is studied with reference to the main rotor system, the conditions required, basically, are a high rate of descent, at low airspeed, and power applied. Now make a comparison with the tail rotor in the described situations. A high power setting is present; a wind of 5 to 12 knots is equivalent to 510 to 1,220 feet per minute, and a wind from the left on the tail rotor is surely the same as a rate of descent; the slight tail-low attitude is attained by the low airspeed. Essentially the conditions for settling with power are the same as those for tail rotor breakaway. Hence, the phenomenon also could be described as settling with power on the tail rotor.

This latter explanation is useful when corrective actions and preventive measures toward the phenomenon are studied. If any one of the required conditions is eliminated, then the aviator has corrected for settling with power or tail rotor breakaway. The corrective actions for settling with power of the main rotor system are to reduce power, or gain airspeed, or both. The same actions correct for tail rotor breakaway. The gaining of airspeed eliminates the tail-low attitude and slow airspeed and thus reduces the requirement for a high angle of attack. This action obviously may not be possible in confined area operations or NOE operations. The other recovery action is just as difficult to perform. To lower the power, or angle of attack, right antitorque pedal must be applied. Since the aircraft is already turning rapidly to the right, such an action is unnatural. However, the result of either action will reduce the yaw. Tail rotor breakaway is then obviously not a situation that any aviator, in an operational setting, would wish to encounter.

Before concluding with preventive measures, there are two other areas of concern, both of them design features, which can aggravate the possibility of tail rotor breakaway—exhaust gases and the tail fin. At the slow airspeed, tail-low attitude that has been considered, the exhaust gases produce local heating of the air around the tail rotor. The density of this air is therefore reduced. Thinking back to our basic formula, the only way for which this drop of air density can be compensated by the aviator is by an increase of angle of attack of the tail rotor. The tail fin effectively "blanks off" a portion of the tail rotor disc area. By studying Figure 3 it can be seen that not only is little thrust produced in this area, but also there is an area around the fin that is nonproductive. In the case of the UH-IH Huey, this total nonproductive area is about one-third of the total tail rotor disc area. If the same area is examined on an OH-58 with its relatively large tail fin, then an even greater portion of the disc area is affected. Due to the design of the tail rotor, the surface area of the blades, and the size of the tail fin, it is suggested here that the Kiowa aircraft is prone to tail rotor breakaway. Conversely, due to the size of the tail rotor blades and the relatively smaller tail fin on the Huey, the phenomenon is less likely to occur.

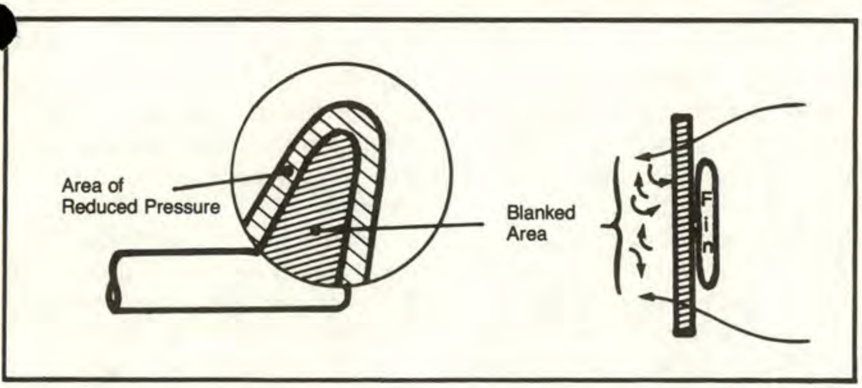


Figure 3

Therefore, design features may prevent or produce the chances of tail rotor breakaway occurring. Apart from the design features of the tail rotor and the fin there is another feature which would assist in alleviating this problem; mount the tail rotor on the right, or starboard side, of the tail boom, as in the AH-1 Cobra, to yield a more efficient tail rotor.

Having mentioned how design features may alleviate the onset of tail rotor breakaway, it would be highly amiss not to study the preventive actions that an aviator may take. As mentioned above, if any one of the required conditions for tail rotor breakaway can be eliminated, then, it can be proved, prevention is accomplished. The two factors over which the aviator has control, and which should be considered when operating into confined areas at high GWT or high DA, or when operating at NOE, are a relative wind from the left, and the requirement for high power. Power must be monitored closely and demanded with care; the aircraft must always be in trim unless there is a possibility of a tail strike. In that case the tail should be moved judiciously. The possibility of having a relative wind from the left, whether naturally or artificially produced, must be borne in mind and avoided if at all possible.

Without wishing to see any further limitation imposed when operating at NOE or when conducting other maneuvers near the borderline of the aircraft's limitation, this phenomenon must be considered by discerning aviators at all times so that they may carry out their mission successfully. It is hoped that this short discussion of an aerodynamic short fall in helicopter design will help aviators to understand their machines better, and to enable them to prevent a failure of mission due to the environment in which they work. ■

Courtesy *U.S. Army Aviation Digest*, June 1980.

SEASONAL HAZARD

By MAJOR JAMES L. GILLESPIE, CF
Directorate of Aerospace Safety

■ A soaring bird is a beautiful sight to some people. To the pilot of a high-speed jet aircraft however, it represents a hazard which could spell disaster. Each year the USAF experiences hundreds of aircraft collisions with birds which result in millions of dollars in damage. Over a 2-year reporting period, 1 Apr 78 to 31 Mar 80, there were 3,258 reports submitted of birdstrikes with USAF aircraft. Fortunately, no crashes or fatalities occurred; however 5.775 million dollars worth of damage resulted, and several close calls were experienced. We weren't always so lucky. Documented evidence indicates that during the past 12 years seven military pilots have been killed and 14 aircraft destroyed because of birdstrikes. Birds are suspected in several other aircraft crashes as well.

The problem is not unique to the military. Commercial aviation records show that within the past decade there have been 29 civil registered aircraft destroyed and 14 fatal accidents where birdstrikes were a factor. During the last seven years, birdstrikes have resulted in the destruction of jet transport and executive aircraft at the rate of one and one-half per year. During 1978, there were 36 reports submitted to the FAA detailing birdstrike damage to aircraft ranging from windshield penetration to the fatal crash of a Convair 580. These aircraft had passenger loads ranging from 2 to 265 people.

The bird-aircraft-collision problem is with us every day of the year. Statistics indicate that most strikes occur at or near airports, either on takeoff or landing and below 3,000 feet AGL. A graphic display clearly indicates that the months of April/May have a higher incidence of birdstrikes than the norm. The rate decreases slightly during the summer months, June through August, then rises dramatically in September, October, and November, with October being the peak month with over twice as many reported birdstrikes as any other month of the year. October also produces more damage per strike, which is understandable since this time of year represents the peak of the migration season. The potential for birdstrike disaster reaches its peak as waterfowl, weighing as much as 15 pounds each, move South into their winter habitat.

The greatest movement of waterfowl is along four primary routes: the Atlantic, Mississippi, Central, and Pacific flyways. Because of their size and large numbers, ducks, geese, and cranes present the greatest hazard. These hazardous species of birds are preceded by migratory song birds. The smaller birds have been involved in serious mishaps, but generally they cause minimal damage.

These photos show damage inflicted by bird of unknown species on a T-38. Front windshield was cracked and the front canopy shattered. Closeup shows extensive damage to area directly behind the front headrest and drogue chute. IP was unhurt and student in front seat received only minor bruises. Left engine damage resulted from ingestion of pieces of canopy plexiglas.

If your flying unit suddenly encounters numerous flocks of small birds in their flying area during migration season, it is probable that gaggles of much larger waterfowl will soon arrive. An increase in small bird impacts found on postflight inspections will aid in identifying those operations which entail the greater risk from birds. If your base of operations is on or near one of the four main migratory flyways, or if you are required to perform flight into these areas, there are positive steps which can be taken to lessen the hazard.

- Limit night flights as much as possible during October and November; these are the peak migration months.
- If numerous small bird impacts are experienced, curtail night flying for approximately one week to allow these small bird flocks to exit the local area. They transit an area quickly and quite often at night.
- Flights below 10,000 feet AGL should be kept to a minimum because most migratory activity occurs between 1,500 feet and 5,000 feet AGL.
- Airspeed below 10,000 feet AGL should be kept as low as practical. Each time the airspeed doubles, bird impact forces quadruple, and it is not uncommon for a mallard duck to create an impact force of 200,000 pounds.
- If at all possible, landing lights should be displayed below 10,000 feet AGL to assist in bird avoidance. If birds are encountered, the aircraft should climb since bird distribution diminishes with altitude; also, it has been determined that birds in flight that are startled or feel threatened, instinctively dive.
- Use of low-level routes should be scheduled between 0900 and 1500 daily because waterfowl activity is at a minimum during this time. Preference should also be given to routes with an East-West orientation to further reduce exposure, and route segments that fly over bodies of water should be avoided.
- Visors should be worn by the pilots at all times during flight below 10,000 feet AGL, and the windshield should be heated to improve bird resistance.
- Low-level mission briefings during September, October, and November should include bird encounters and actions to be taken in the event of a birdstrike which may result in serious injury to the pilot or loss of cockpit communications.
- Local state and federal wildlife officials are the best source of information on local bird movements. Flyway data have been published in various documents, and this information can be procured from your region offices of the US Fish and Wildlife Service at the US Department of the Interior.

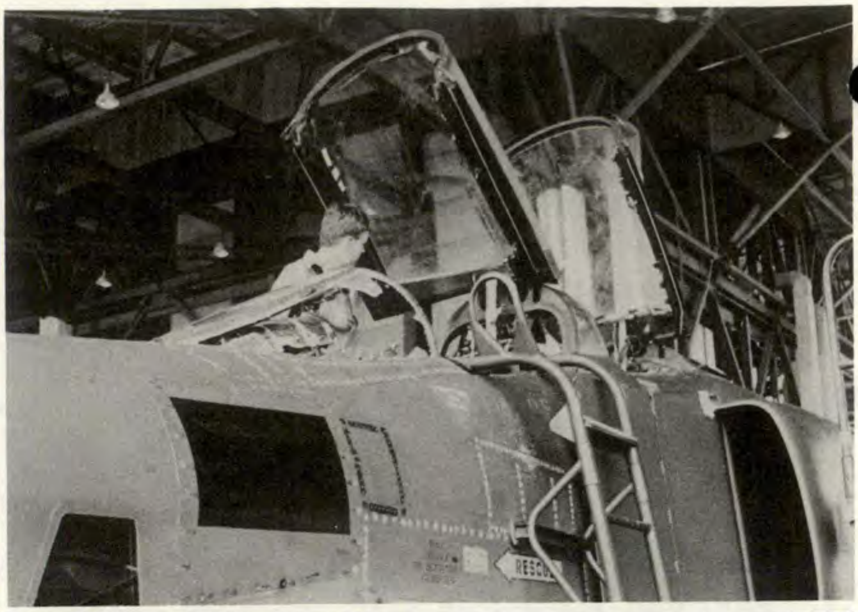
☞

SEASONAL HAZARD

continued

Although the spring and fall migration seasons present the greatest hazard, bird avoidance is a year around requirement. A great deal of activity is devoted to the bird/aircraft problem, and an important part of it is the reporting of bridstrikes. Without the statistical data to study, new and more effective control measures cannot be taken. Progress has been made in some areas – specifically, the bird populations in and around airfields. A study released in April 1976 indicates that 51 percent of the reported birdstrikes occurred within five miles of the airfield. More recent data show this figure to be 46.6 percent. This may indicate that airfield environment control programs are producing positive results. Improving drainage, proper ground cover management, the use of alarms, shell crackers, birds of prey and disturbing bird nesting habits all have had some effect.

Several countries recognize the hazard birds pose to aviation. Canada and several of the European countries have expended a good deal of effort toward the resolution of this problem. Research into the effects of ground and aircraft-mounted microwave, laser and bio sonic transmitters is being conducted. Bird tracking radar and methods of forecasting bird movements are also being investigated. Perhaps the most obvious method of dealing with the problem is being overlooked. Pilot education and timely reporting of bird hazards which can be translated back into operational mission planning. I'm sure that neither you nor I want to meet our end by a chance encounter with a feathered friend. ■



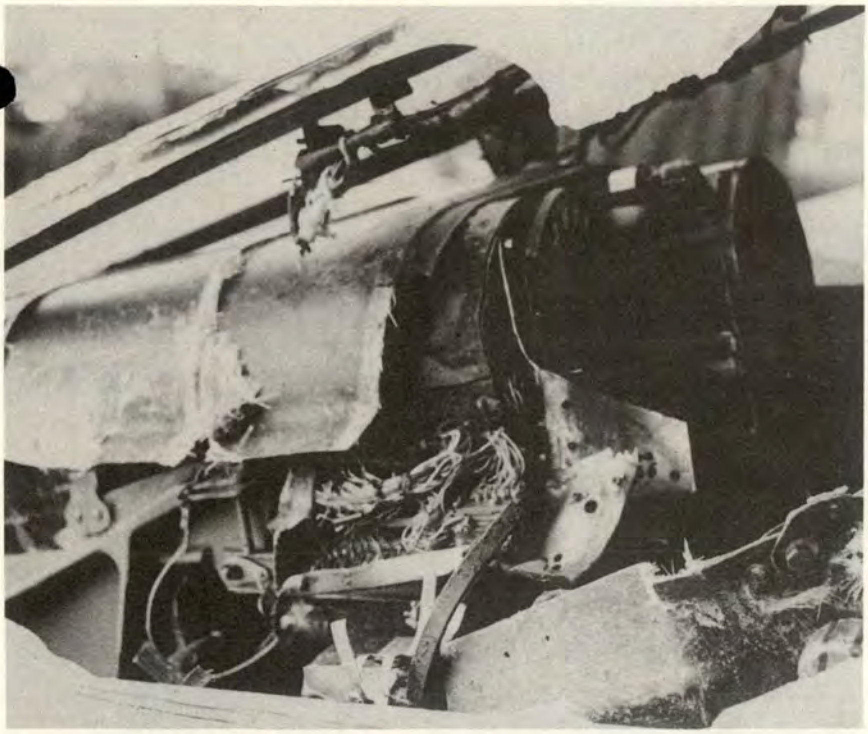
BIRDSTRIKE AT 480 KTS.

■ After a look at the photos on these pages, you might wonder if the pilot survived. He did—with some cuts and bruises. The mission was a low level recce flown at 480 kts and 500 ft AGL. Here's the FSO's description of the incident.

The pilot saw a shadow followed immediately by impact. There was a loud noise and jolt as the bird entered the cockpit followed by a loud buzzing and an increase in noise level and vibration. The bird hit the landing gear handle causing the gear to extend, struck the pilot in the left arm, chest, and helmet and continued aft knocking off the rear cockpit mirror. The bird struck the WSO in the helmet and, as discovered after landing, the bird and the mirror came to rest lodged in the banana links of the rear cockpit ejection seat. The WSO took control of the aircraft, began a climb and slowed down so cockpit communications could be regained. This procedure was briefed in the pre-mission briefing.

The pilot was able to take control after he made an assessment of the damages. The left front quarter panel was missing, the front windscreen was shattered, most of the instruments on the left side of the panel were either missing or broken and unusable and most of the front canopy was covered with blood, bird flesh, and feathers.

After inter-cockpit communication was reestablished and the pilot took control, he declared an emergency and requested a chase aircraft to check his gear. The gear indicated down and locked and this was confirmed by the chase. During



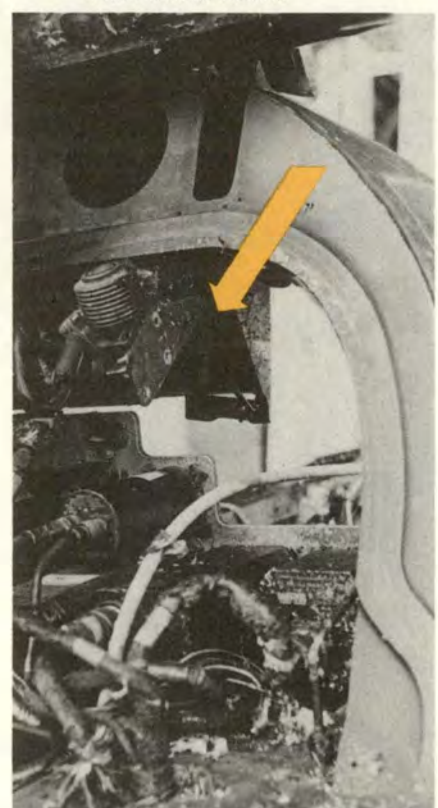
Far left, bird entered through left quarter panel. Left, instruments were torn out, gear handle hit causing gear to extend. Below, pilot's helmet; what if visor hadn't been down?

a controllability check it was discovered that the ground speed indicator was the only speed indicator working in the front cockpit. The WSO called out the airspeeds during the remainder of the flight.

Prior to the approach the gyro and heading system failed so a no-gyro PAR approach was flown. The pilot was able to pick up the VASIs through the shattered windscreen about two miles on final and landed the aircraft. The aircraft was stopped straight ahead on the runway and shutdown. It was then discovered that the rear cockpit ejection seat had been damaged. The fire department cut a hole in the rear canopy so egress personnel could safe the seat. The crew was taken to the hospital where the pilot was treated for minor lacerations and abrasions of the left arm and contusions of the left side of his chest. Investigation revealed a bird was also ingested in the nr 1 engine causing damage to the CSD housing and minor damage to the engine. ■

Left, rear canopy hole cut by firemen. Below, destructive force of impact damaged many components.

NOTE: Command Selector Valve Has Been Torn From Its Mount.



Our thanks to Captain Mike Hambrick, FSO 363TRW for photos and narrative–ed.

REQUIEM FOR A HEAVYWEIGHT

By BLAKE C. MORRISON
Production & Design Mgr.
57FWW/DOWN
Nellis AFB, NV

She was called many things but THUD stuck. She could do it all, including a stint as the Thunderbirds' bird.

■ The standard joke around the bar in the Officers' Club in the early sixties would go something like this: An F-4 driver would raise his voice and demand, "What's the sound an F-105 makes when it hits the ground?" Came the rousing chorus response, "THUD!!!" Numerous chortles, snickers and guffaws.

THUD.

That's one of the most respected names in the history of American aviation.

She was called a lot of things then— hyper-hog, ultra lead sled, ultra hog, Drop Forged by Republic Aviation and a lot more names that are unprintable. No one ever called the F-105 by her official name, "Thunderchief," except the press. She was one big joke early in that decade. That is, she was to all except those of us who flew her.

But, "THUD" stuck. And we Thud drivers just smiled a knowing smile and quietly continued separating the gin from the ice. We knew something the others didn't. She was one of a kind. She

was as stable as a Swiss franc and she could hit. She could hit with the Gatling gun and she could hit with bombs— lots of bombs. She had long legs at low altitude. She was fast. It was very easy to go fast with her— especially on the deck. And nobody else could go that fast.

Then we were presented with Vietnam and we found out some other things. From 1966 to 1968 she was THE one to carry the big iron downtown. She wasn't exactly designed for it, but Thuds hauled seventy-five percent of the smash carried down Route Pack Six. And in combat, she maintained a 90% in commission rate.

Maybe it was because she was used to taking hits from anyone and everyone, for we found out that she could take other kinds of hits—the *real* kind as well—and still fly. As as example, numbers 512 and 376 (two dash tens) took direct SAM hits aft and came back home. So did number 167 (a dash five) return with the entire right stabilator shot off.

But she wasn't perfect. No *real* lady is. She couldn't turn worth a damn. We found that out early on in USAFE any time we tried to engage a Hunter or a Mark Six. We figured even a frisbee would outturn the Thud. To improve her chances in the air combat arena, there was a proposal in 1967 to upgrade each Thud by extending the wings 18 inches, removing the duct plugs and displacement gear to decrease weight, increasing internal fuel capacity by sealing the bombay and installing a larger tank, increasing thrust by 5,000 pounds and adding other combat improvements. Ah, what might have been. She would have been a Super Thud.

And she didn't always come back. Her corpses line Thud Ridge, Hanoi, Thanh Hoa and a lot of other places up north. She wrote the epitaph for a lot of good men like Karl Richter. She died a lot. Over half the inventory was gone by the end of 1968— most lost in combat.

She became a legend and legends flew her: Robbie Risner, Karl Richter and Leo Thorsness, to mention a few. She was flown by other greats such as Dave Waldrop, Billy Sparks and Pete Foley. And she was handled by many unknown like Bob Gerlach, Jim Stiles and me.

As a Weasel she reigned supreme. She killed SAM sites, SAMs, MIGs and earned medals of honor for two men, Leo Thorsness and Merlyn Dethfelsen.

The Thud piled up thousands of combat hours on each bird and she was said to be weary and worn out. But ask any F-15 driver who tried to pace her at low altitude during Red Flag 80-2. It was, "Check twelve, Turkey, and I'll be waiting for you at the Club back at Nellis." She's the only bird I know that can give you "the bird" whether parked on the ramp, taxiing out or in-flight.

She entered the inventory on 26 May 1958.

On 12 July 1980 she made her last scheduled operational Air Force flight at George AFB. She goes on to the Guard and Reserve. But she stays with us as an American classic and a real thoroughbred. She could break your back but never your heart. She is genuinely loved by all who flew her and a lot who didn't.

The epitaph for a great American, "Feo, fuerte y formal," fits the F-105— "She was ugly, she was strong, but she had dignity."— Courtesy ***USAF Fighter Weapons Review,*** **Summer 80, Issue 2.** ■

An F-105 Camera caught this photo of another THUD coming off a bomb run on a rail line north of Hanoi.

VOLCANOES AND AIRPLANES

■ *The eruption of Mount St. Helens and subsequent spreading of volcanic ash over a huge area produced some serious problems for aircraft operation. The Boeing Aircraft Co published an informative paper, part of which is presented here. It's good information to keep on file. Who knows when or where the next eruption will occur?*

Composition

Samples of ash have been analyzed with the following results.

Abrasiveness	– High
Hardness	– Approximately 6 on the MHO scale / close to quartz
Texture	– Resembles talcum powder
Acidity	– Ground samples near neutral/PH 5.2 to 6.8/. Samples taken at 55,000 to 65,000 feet indicate a PH factor of 2/highly acidic.
Toxicity	– None known to date
Corrosiveness	– Considered non-corrosive over short term but ash removal should be accomplished at earliest opportunity. Abrasive nature of ash can destroy leading edge finishes through erosion, thereby producing a corrosive situation.

Major constituents

Silicon	Aluminum	Potassium
Calcium	Iron	Copper
Oxygen	Titanium	Sulphur
Chloride		

Trace amounts – Fluoride

Particle size distribution/ground collected sample taken approximately 100 miles from St. Helens:

Under 5 microns	70 percent
5-15 microns	28 percent
15-25 microns	1.4 percent
25-50 microns	0.3 percent
Above 50 microns	trace amounts

Effect of Flight Through Ash Cloud

Two airplanes have been briefly exposed to the air borne dust cloud, where particulate concentration was extremely high because of the proximity to the volcano. Post flight inspection showed similar effects in both cases:

All windshields pitted. One airplane required replacements

Engine fan blades pitted

All leading edges appeared etched or shotpeened

No corrosion

Exposure to Contaminated Runways

Ash appears to have high static charge. Observers reported that road traffic over this volcanic fallout generates dense dust clouds which are slow to settle. Similar effects can be expected on contaminated airport runways, making dust exposure inescapable. During

Ground operation where this material is present it will settle on exposed lubricated surfaces and may penetrate many conventional seals, enter the engine gas path and air conditioning system, and may enter other orifices on the airplane. In view of the potential adverse effects, operation out of airports with volcanic ash deposits should be avoided if possible.

Certain recommendations were made including:

Operations

Limit reverse use as max reverse may impair visibility, particularly at low speeds.

Taxi slowly with minimum power.

Allow ash and dust to settle before takeoff.

Use rolling takeoff.

Use APU for starting only and not for air conditioning. Use filtered carts on ground if available.

Do not use windshield wipers for dust removal. Hose off ash deposits and wipe off remainder with a soft cloth.

On B737 aircraft, vortex dissipaters must be operating and used at all times on the ground and do not use engine bleeds for air conditioning when it is on.

Braking. Presence of a light layer of dust on runway that covers or obliterates markings could have a detrimental effect on braking. The effect of a heavy layer, or of dust mixed with water, is unknown. In addition, brake wear will be accelerated. Properly sealed bearings should not be affected.

Maintenance

Check air, oil and fuel filters and generators and change oil more frequently.

Check pitot system for erosion, static ports and drain holes clear.

Surface contamination – to minimize abrasion, do not wipe, rub or walk on ash coated surfaces. Clean with water wash using alkaline detergent. Flood with water.

Due to the relatively high abrasiveness of the ash, increased wear rates of externally lubricated mechanism, e.g., bearings, ball nuts, jackscrews, control cables, etc., may occur. To minimize this exposure, relubrication of affected components should be performed at the earliest opportunity if ash has been encountered. Accumulated ash should be wiped off with a soft cloth. Use of solvents, particularly on control cables, should be avoided, as solvent may carry ash into areas where relubrication may not liberate. Remove ash from primary flight control balance panels, seals and hinges.

Physiological Effects

Some odor may be present in the cabin, however, no long lasting effects are anticipated unless some form of respiratory ailment is already present.

Minor eye irritation may be expected. Contact lenses should be removed. ■

COFFIN CORNER plus WINDSHEAR equals UPSET

Normally, when we hear "windshear" we think of low altitude-final approach type encounters. However, shear can occur at any altitude and cause trouble. Sometimes we call it CAT. Whatever, pilots should keep ahead of their aircraft and be prepared to counter the effects of windshear, wherever, as the event described in the following so strongly suggests.

■ During the outbound flight, light to moderate turbulence was experienced at different cruising levels, and information from the INS confirmed frequent changes in wind direction and velocity. In addition, the meteorological documentation as of 1800 GMT made available to the crew of a DC-8 before their departure from Buenos Aires carried an ''Important Notice'': *CAT between Buenos Aires and Curitiba (Brazil) from FL 300 and up to FL 390.*

The flight departed Montevideo at 1800 GMT with 130 persons, including eight crew members, aboard. It was cleared to Rio de Janeiro in accordance with a stored instrument flight rules flight plan. The assigned enroute flight level was 370. The flight was uneventful during takeoff, climb, and the initial part of the cruise at FL 370. After about 30 minutes flying at this flight level it was decided to request another flight level – FL 410 – due to light to moderate turbulence. The ''Fasten Seat Belt'' sign had been switched on. Almost immediately after leaving FL 370 the clear air turbulence disappeared and flying at FL 410 was smooth and the ''Fasten Seat Belt'' sign was switched off.

The flight continued for another 10 - 15 minutes with little or no turbulence, and the speed stabilized at mach 0.80. Keeping the speed stabilized incurred constant, minor adjustments of the power.

All of a sudden, the Captain noticed a very rapid increase in the speed and actually made a remark to that effect, leading to an observation of mach 0.84 by all three pilots. As the Captain put his hand on the throttles to make an adjustment, the autopilot disconnected without any warning and a violent pitch-up occurred. This maneuver was associated with heavy airplane buffeting with a "settling" into the attitude. Both pilots pushed forward on the control columns having to exert considerable force. The Second Pilot standing behind warned against a too violent recovery. The climb was arrested at approximately FL 420 and a descent towards FL 410 was initiated while the autopilot was re-engaged including the Altitude Preselect System.

The decision to fly at FL 410 brought the aircraft in a vulnerable situation from an aerodynamic point of view with regard to Stall and Buffet Onset Speeds and atmospheric conditions.

At the time of the incident the INS wind was 310°/55 kt as opposed to 270°/85kt just before the incident. The pilots stated that the aircraft was at FL 410 before the incident and at FL 410 after the incident.

Shortly thereafter, the Air Purser came and informed about an injured passenger, stemming from hitting the ceiling in the aft galley as he was walking from a toilet towards his seat. An additional passenger and a cabin crew member in the galley area, managed to secure themselves.

The decision to fly at FL 410 brought the aircraft in a vulnerable situation from an aerodynamic point of view with regard to Stall and Buffet Onset Speeds and atmospheric conditions.

The subsequent sudden windshear (270°/85 kt to 310°/55 kt) compared with a 056° heading of the aircraft resulted in a decrease of 55 kt tailwind component, thus creating an acceleration from mach 0.80 to 0.84 due to inertia.

A blow-up of the information from the Flight Data Recorder indicates in addition that positive vertical acceleration occurred at the time of the shear. The magnitude was only 0.2 to 0.3 G, enough under the prevailing conditions, however, to reach Buffet Onset Speed. The sequence of events was as follows:

Windshear

Longitudinal and vertical acceleration

Flow separation at the wingtips

Rapid, forward, movement of the center of lift

Automatic Flight Control system disengagement

Pitch-up

Recovery

The Automatic Flight Control system, and particularly the Pitch Trim Compensator, is not designed to accommodate for sudden forces as described above, which is the reason that the autopilot disengaged.

It appears in summarizing the factors that led to the pitch-up, that a less than desirable level of attention was paid to readily available information about:

Jetstream/windshear

Airplane gross weight versus altitude

Temperature deviations from standard

It is concluded that the cause of this incident was a windshear of a magnitude for which the autopilot was unable to compensate.

Contributing to the cause of the incident was the decision to operate the aircraft near its service ceiling through areas where windshears could be expected.

Recommendations were:

1. Flight deck crew members are instructed that a diligent utilization of all available information is of particular importance whenever they choose to operate an aircraft close to the performance limitations.
2. Flight deck crew members, in general, be furnished with knowledge during initial and subsequent training about the extreme care which must be exercised to prevent flight into the buffet boundary area. ■

– Courtesy *Air Safety Review,* July 1980

OPS topics

Wrong Barrier

■ An F-4 crew was completing a routine mission with an approach end BAK-12 arrestment. To make sure the aircraft was down well before the BAK, the pilot flew a low, dragged in approach and touched down 30 feet into the overrun. What they didn't realize was that there was an MA-1 in the overrun which was lowered but connected. The tailhook got the MA-1 from the wrong direction and pulled the chains three inches before the B cable failed. Fortunately, there was no damage to the aircraft. From this we can learn that

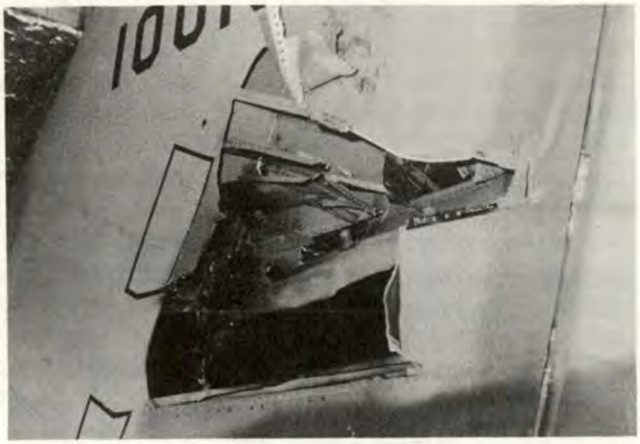
- F-4 crews seldom engage an MA-1 and, therefore, may not be aware of their presence.
- The status of the MA-1 was not relayed to the crew.
- Unless there is an emergency, the MA-1 should be removed for practice BAK-12 arrestments.
- Pilots should be made aware of the configuration of the runway, i.e., location of all barriers.
- Controllers should inform pilots of barrier status.

UFO

A bullet, a rocket, superman . . . a tank?? That's what the crew reported – a tank. According to the fighter crew, the AC was looking out to the left when the WSO asked him to check 12. Both then saw what appeared to be a silver drop tank 30 to 40 feet long. The pilot made a hard left break and the object passed some 50 feet to the right. They reported the event to radar which did not pick up the object. Now the plot thickens.

- No such dropped object was reported.
- The crew did not perceive a downward vector of the object. In fact, they weren't sure it was falling, or even moving.
- The occurrence did not coincide with a scheduled weather balloon release.
- It's characteristics were not that of a weather balloon.

What the object was has not been determined. Could it be . . .?



A Kick In A B-52 Tail

That hole in the vertical stabilizer of a B-52, shown above, was caused by a lightning strike. It's about 6 x 6 ft. and the other side of the stabilizer had a 3 x 3 ft. hole.

The aircraft was on a routine training mission which included low level navigation on an IR. The weather was forecast as isolated thunderstorms. An hour after launch, a Metwatch was issued for 80 percent POLC (probability of lightning conditions) on the IR effective 1200L. The pilot could see they were approaching a steadily lowering ceiling with associated rain showers and elected to discontinue terrain avoidance and climb to IFR altitude (9,000 feet).

About 30 seconds after entering the clouds, the crew saw a bright flash in front of the pilot's window, which they took to be a lightning strike on the radome. Simultaneously, they felt a jolt and heard a loud bang.

The navs reported that radar mapping was lost, and the pilot immediately notified the RBS contoller that he was aborting the low level. Prior to the incident, the navigator, who had been radar scanning ahead, saw no weather returns indicating thunderstorms.

After the aircraft landed, damage to the vertical stabilizer was discovered. Those are big holes. Furtunately, though, there was not enough damage to fail the stabilizer.

Buy Some Insurance: File a NMAC

Among the several Hazardous Air Traffic Reports (HATRs) and Near Midair Collision Reports (NMACs) filed nearly each day are some that should teach us something. For example, you may not know that the controlling agency may not track that aircraft that nearly ran into you unless you report the near miss and state that you intend to file a NMAC The idea is that if the other aircraft and pilot can be identified, it makes it possible to counsel the pilot if he was creating a hazard unknowingly. An example of this situation was a civilian instructor pilot new to the area. Within minutes, he managed to cross the final approach at an AFB twice with our aircraft on final. In each case, the miss distance was small enough to be a hazard if the USAF pilots hadn't seen him. He was identified and the FBOs at the nearby airport have made a special briefing for civilian pilots.

Crews and Controllers Alike

A C-130 pilot, with one engine out, declared an emergency. Center asked if he needed any special handling and the pilot said no, just normal emergency response. Center informed approach control that the pilot didn't need any assistance at his destination. Approach control advised tower that the pilot cancelled his emergency. While on short final, the C-130 was sent around for spacing behind another arrival. Center had passed erroneous information to the terminal facility, further aggravating a potentially serious emergency. Lessons learned: verification of inflight emergency status is the responsibility of both *aircrews* and *air traffic controllers*. – Lt Col Nicholas O. Gaspar, Directorate of Aerospace Safety.

Aero Club Mishaps

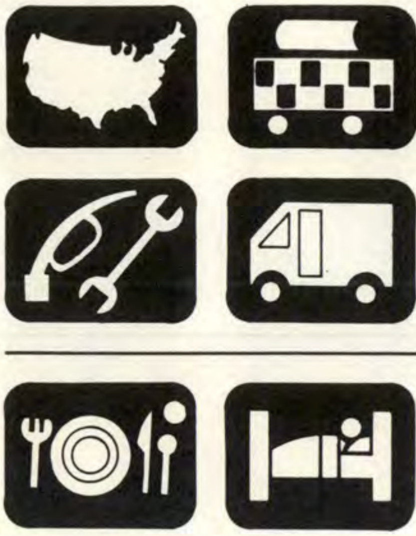
A couple of aero club mishaps provide us with some grist for thought about how not to do it. One member in a Cessna 172 parked behind another aircraft at the fuel pit. He was about to chock his airplane when the other attempted to taxi with chocks still installed. In trying to help the other pilot, he left his airplane unchocked. A prop blast from nr 1 caused nr 2's airplane to roll down a gentle ramp – backwards. The airplane rolled into a chain link fence and received some damage. His concern for the other pilot was laudable but not at the expense of his own aircraft.

* * * *

Another aero club pilot got into trouble in the same way many others have done. Weather was bad, the flight plan VFR but some actual instruments were flown. The weather blocked out the flight and caused extensive detours that led eventually to a forced landing (out of fuel) in a farm field. Fortunately, neither pilot nor passenger was injured and the aircraft was flown out next day by another pilot. Be brave! Don't be afraid to make a 180.

Hot Cockpit

During descent to base on a cross country, the pilot of an F-106 noted the canopy defog system to begin operating without the switch being used. At the same time he saw a bit of smoke in the cockpit and his eyes began to burn. Despite all efforts, the hot air flow through the canopy defog system continued. The pilot declared an emergency and was given vectors to his base. However, on his first two landing attempts he had to go around because eye irritation degraded his vision. He landed safely on the third attempt, was met by the flight surgeon, treated and released. The canopy defog valve had an internal short which caused the valve to fail in the full open position. Even with cabin temperature at full cold, this condition could cause intense heat in the cockpit. ■



X-COUNTRY NOTES

By MAJOR DAVID V. FROEHLICH
Directorate of Aerospace Safety

■ First, a small commercial message! We're winning – this trip we visited places for the third time in two years. Generally, the places on the Rex Riley list had certificates hanging proudly on the wall, and they displayed helpful attitudes to match! Places not on the list were obviously several steps below. Shabby facilities, out-of-date pubs, missing forms and generally lackadasical folks helped to restore our faith in the list. One comment made our day: "You know, the Rex Riley Program is the common denominator. Maintenance owns TA, Ops owns the airfield, the base owns transport/billeting/inflight. The point is that Rex Riley is the one cause or program that all the agencies can relate to and get behind. The Rex Riley Award is an excuse and good reason to talk to one another and cooperate to provide outstanding, safe service to transient aircrews."

Thanks, we needed that! The only thing I'd like to add is that Rex is also a super sounding board for all the players. We love to pass on complaints, kudos, or ideas from crews, Ops, TA or anyone involved.

INFORMATION

CREWS – We still can't work up a lot of sympathy when you write in and complain about a bad turn or bad service when you dumped a flock of transients on a base with no notice. Rarely is there an occasion when you can't call PTD (or somebody) at least 30 minutes out to let them know you're inbound. It's preferable to use the phone a day or several hours in advance, but at least call the Base Ops folks on the way in. No excuse!

We want to remind you that we blue suiters also operate under a certain number of FAR's and FAA rules besides the myriad of Air Force books we are bound by. The point came home as we watched a covey of eagles arrive at a joint-use field. The tower became noticeably testy as the four-ship took awhile to clear their only active as one of the proud birds was on short final. Word to the wise – you play "you bet your wings" when you enter that environment and, again, a call ahead might grease the arrival. Don't be unsafe, but don't dally either because to those folks time is money, and often they are quite sensitive!

OPS – Reflection time. When was the last time (other than CFI) that you took a good look at the paint in your facility, sharp edges on counters, lights burned out in the flight plan room, forms available. AUTOVON availability, handy use phone numbers, airfield diagram, NOTAM hourly updates, grass length around runway remaining markers, paint lines on runways/taxiways, etc.! That's a capsule of the last trips write-ups.

Empathy time. Aircrews come in all sizes, shapes, numbers, colors and sexes. Step back and take a look to make sure your services and facilities are adequate and set up for the single-seat driver *as well as* the multi-place transports with 7 - 9 folks with a variety of requirements.

Review time. Also, step back and take an empathetic look at the total FLIP package for your airdrome. Check the amount and clarity of info you have in the IFR Supp, A/P 1, letdown books, SID's, etc. Especially, take a hard look at the confusion factor with operating hours vs TA available hours, daylight vs standard time, pattern altitudes, entry instructions, and contact instructions/frequencies. A lot of info may have to be digested in a hurry, so the fewer confusion traps, the better!

RETAINED AWARDS

MATHER AFB – High density traffic area, so look out! Good facilities and service. Variety of aircraft makes this another place to pay close attention to patterns, taxiing, and parking.

MAXWELL AFB – TA folks are outstanding! Service and facilities make this a good stop or stay. Runways a little short for some of us on those hot and/or wet days.

ANDREWS AFB – They still have some priorities and procedures which boggle the average aviator's mind. They appear, however, to still be trying to mesh their problems with generally good service for transients. Save some extra gas for sightseeing vectors in the Washington area, and save an extra pencil to copy your departure instructions. Send Rex your experiences and thoughts regarding Andrews.

OFFUTT AFB – Another location with priority traffic that still does a good job for transients. The more notice you can give Base Ops, the better service you're going to receive. I reinforced my respect for landing on 12 with a stiff X-wind through the buildings. Don't be surprised!

PATRICK AFB – Folks down there are really trying to take good care of transients. Quarters, TA, and Ops folks are super. Lots of coastal little airplane flyers make an eyes-open arrival a good idea.

RAF MILDENHALL – We had a super report on these folks. Base Ops and especially TA were singled out as being top-notch players, and WX, quarters, transport, and food facilities were all excellent.

BAD GUYS

BASE X – Under the plexiglas on the flight plan table was a one month out-of-date H-1/H-2, H-3/H-4. Goes with the attitude.

BASE Y – A new, neat, and clean Ops counter, but total disorganization and confusion behind it. Billeting – we stood (along with eight other folks including an 0-6) for 25 minutes while the five ladies behind the counter accomplished a shift change and inventoried the soft drinks and razor blades. Other places do it smoother!

BASE Z – We had a small maint problem which would require a specialist, a part, and 10 minutes! We called 150 miles out and passed the details and request thru Base Ops. Everyone (Ops, TA, job control, supply, etc.) dropped the ball and our stop took 3½ hours. The flight plan area is still a dungeon, and the dispatchers still don't care.

ALMOST UNMENTIONABLE – We've watched for two years and still see negligence in the TA operation, late and incorrect service by Fleet and PAX services, non-sympathetic billeting personnel, and confusing and hesitant air traffic service. Lack of interest!

End of report! We care and hope to help, but crews and players can help too with a X-feed of information. Write REX RILEY, AFISC/SEDAK, Norton AFB, CA 92409. Fly smart! ■

THE

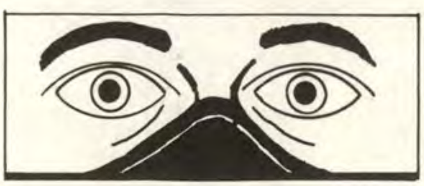
REX RILEY
Transient Services Award

LORING AFB	Limestone, ME
McCLELLAN AFB	Sacramento, CA
MAXWELL AFB	Montgomery, AL
SCOTT AFB	Belleville, IL
McCHORD AFB	Tacoma, WA
MYRTLE BEACH AFB	Myrtle Beach, SC
MATHER AFB	Sacramento, CA
LAJES FIELD	Azores
SHEPPARD AFB	Wichita Falls, TX
MARCH AFB	Riverside, CA
GRISSOM AFB	Peru, IN
CANNON AFB	Clovis, NM
LUKE AFB	Phoenix, AZ
RANDOLPH AFB	San Antonio, TX
ROBINS AFB	Warner Robins, GA
HILL AFB	Ogden, UT
YOKOTA AB	Japan
SEYMOUR JOHNSON AFB	Goldsboro, NC
KADENA AB	Okinawa
ELMENDORF AFB	Anchorage, AK
PETERSON AFB	Colorado Springs, CO
RAMSTEIN AB	Germany
SHAW AFB	Sumter, SC
LITTLE ROCK AFB	Jacksonville, AR
TYNDALL AFB	Panama City, FL
OFFUTT AFB	Omaha, NE
BARKSDALE AFB	Shreveport, LA
KIRTLAND AFB	Albuquerque, NM
BUCKLEY ANG BASE	Aurora, CO
RAF MILDENHALL	UK
WRIGHT-PATTERSON AFB	Fairborn, OH
HOMESTEAD AFB	Homestead, FL
POPE AFB	Fayetteville, NC
TINKER AFB	Oklahoma City, OK
DOVER AFB	Dover, DE
GRIFFISS AFB	Rome, NY
KI SAWYER AFB	Gwinn, MI
REESE AFB	Lubbock, TX
VANCE AFB	Enid, OK
LAUGHLIN AFB	Del Rio, TX
FAIRCHILD AFB	Spokane, WA
MINOT AFB	Minot, ND
VANDENBERG AFB	Lompoc, CA
ANDREWS AFB	Camp Springs, MD
PLATTSBURGH AB	Plattsburgh, NY
MACDILL AFB	Tampa, FL
COLUMBUS AFB	Columbus, MS
PATRICK AFB	Cocoa Beach, FL
ALTUS AFB	Altus, OK
WURTSMITH AFB	Oscoda, MI
WILLIAMS AFB	Chandler, AZ
WESTOVER AFB	Chicopee Falls, MA
McGUIRE AFB	Wrightstown, NJ
EGLIN AFB	Valpariso, FL
DOBBINS AFB	Marietta, GA
RAF BENTWATERS	UK
RAF UPPER HEYFORD	UK
ANDERSEN AFB	Guam
HOLLOMAN AFB	Alamogordo, NM

BUT I THOUGHT...

In July we published an article from the Navy's *Approach* magazine on the subject of illusions flyers are susceptible to. It was one of an excellent series by Commander Voge. Our experience during the past year or so indicates that our crews could benefit from the following article by Commander Voge on various forms of disorientation. She will tell you all about *target fascination* or *fixation*, *breakoff phenomenon*, and the *autokinetic phenomenon* or *visual autokinesis*.

Many of the various forms of disorientation simply are due to a lack of attention on the aviator's part. Never happen to you? Don't be so sure! Think back. Whenever we fail to make 100 percent utilization of the inputs in our surroundings, we are subject to this phenomenon.

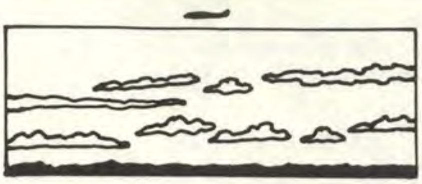


FIXATION: Either boredom or too much attention to a single detail or an aircraft malfunction can bring us face to face with this problem! There is a constriction or narrowing of our field of attention, and we fail to perceive significant and relevant information. (Remember when we were talking about vertigo, the problem was a *misperception*.) When we talk about *fixation* or *fascination*, we simply mean that we fail to respond adequately to a situation, even though we are given all the necessary inputs and know perfectly well what our response should be.

Did it ever happen to you? You betcha! You probably just wrote it off as daydreaming, or perhaps complained that there were just too many things to do at once, or perhaps that the task at hand was too exacting and you had to really concentrate on it. Perhaps it was a certain instrument you were concentrating on, or your aircraft had a malfunction that drew all of your attention to the detriment of all else. This is not always visual. For example: Consider an aircraft coming in for a landing. The pilot is 50 feet too low. The NFO warns the pilot, even screams at him – no response. The aircraft lands short. Similar fixation occurs occasionally on carrier landing approaches. We admit that the most common culprit is the student aviator. He is usually stressed, and he frequently allows his attention to fixate on one instrument, point in space, maneuver, etc. to the exclusion of all else. You more experienced pros have developed a regular scan so that you constantly and consistently know all aspects of your aircraft's performance and behavior. Right? Of course! Except as mentioned above, when you are bored, or when your workload becomes too great, or when you're anxious. You actually become less efficient. Your coping mechanisms fail, and your performance slides. You concentrate on only a few instruments, like airspeed, and forget to check altitude. The low altitude horn comes on loud and clear, but you don't hear it. You're too engrossed in the job at hand. As you might expect, this happens most frequently during instrument flight, but not always.

TARGET FASCINATION: An aviator may become so engrossed on hitting the target, during a bombing run or a rocket attack on a ground target, that he completely forgets to pull up until very late, if he wakes up at all! Ridiculous? Wrong! This was a suspected causal factor in more than a few major mishaps that we reviewed here at the Safety Center last year. It is felt that such things as fatigue, hypoxia, hangover, medication/drugs, and personality factors may contribute to the problem. This phenomenon is difficult to prevent, although keeping oneself physically fit and *on guard* may help. When you do feel as if you're suffering from this problem and you're in a fixed-wing aircraft, first check your oxygen equipment, just to make sure you're not hypoxic, then take it from there.

By CDR V. M. VOGE, MC
Naval Safety Center



BREAKOFF PHENOMENON: The *breakoff phenomenon* usually occurs only at rather high altitudes (30,000 feet or higher). It is often described as a weird feeling of detachment, isolation, remoteness, and separation from the earth and from the aircraft. One feels as if he has broken the physical bonds of earth, or as if he is being balanced on a knife edge. Occasionally, the aviator may feel that he is outside his own aircraft and body, watching himself fly the aircraft. This manifestation plagues the experienced aviator during long, solitary, routine missions with a constant heading. A poor horizon and lack of visual clues of external motion facilitate this illusion. The dark blue sky frequently merges with a uniform cloud cover. This illusion is not the exclusive domain of you high-altitude jet jocks, however. Helo drivers have described very similar sensations while flying as low as 500 feet over an uninteresting seascape, in hazy conditions.

The *breakoff phenomenon* is a rather frequent illusion. About a third of you subjected to these conditions will admit to experiencing it. Most of you describe the feeling as pleasurable, and part of the joy of flying. About a third of you, however, do not appreciate it. You complain that it makes you nervous and is disturbing. Your performance may be adversely affected by your anxiety state. You may have an increased awareness of any change in aircraft attitude or motion. A 5-degree bank may feel like 30 degrees, or you may feel as if you're rolling or banking when you are actually straight and level. You may feel as if you have no visible means of support— that you will literally fall out of the sky.

The sensations involved in this phenomenon are usually very short-lived, and you will rapidly return to reality when you descend, change altitude/attitude, or when your attention is directed to some task at hand, i.e., heading change, comm, cockpit checks, etc. Infrequently, an aviator will require some sort of ground or cloud reference, something that will give relative motion cues, in order to bring himself back to reality.

AUTOKINETIC PHENOMENON: The fourth illusion is the *autokinetic phenomenon,* or *visual autokinesis*. Remember way back when you were in the training command and you were put into a pitch black room— all the lights were put out, except for a lone pinpoint light. You were told to watch the light move, and try to remember its path. Of course, we all were surprised to find, after about 15 minutes of watching the light go up and down and all around (wandering rather aimlessly), that the light was fixed. The movement was imagined, all in our head (or eyes in this case). The illusion appears to be due to the changing tension in our neck muscles and/or a certain degree of fatigue in our eye muscles. The featureless background does not give us enough information about the involuntary eye movements that we are experiencing to be able to compensate. We interpret these movements as movements of the light. This phenomenon is one of the reasons ultraviolet instrument lighting was abandoned in cockpits. The glowing phosphorus against the background of a black cockpit or instrument panel provided the necessary conditions for this illusion. When are we subject to this illusion in the real world? It is most frequent during night formation flying, especially so when only one running light can be seen on the lead aircraft. You may have difficulty distinguishing between the real and apparent movements of the leader. How do we fix this one? There's no good way. The addition of more, bigger, and brighter lights to the background will help, but this isn't always operationally feasible.

As you can see, the *fix* for disorientation phenomenon is not as cut and dried as with vertigo. About the only thing we can recommed here is to keep physically fit and alert, keep changing your points of reference, and don't fixate. — Courtesy *Approach*, August 1980 ■

The  Bad

■ There's a phone in the Pentagon that is connected to all the major Air Staff offices – some call it THE BAD NEWS PHONE. If you're rated, and working anywhere near this phone, you can't help but become intimately aware of its existence. Those of us who are fighter jocks ought to be especially knowledgeable of it since it is our number that's often called.

What's this, another scare tactic? No, it's not. What I am about to say covers some facts the average aircrew member probably doesn't fully comprehend. With all the safety jargon and information that comes our way in the squadrons, it's hard to keep it all in perspective, to know exactly where we stand. This article is one man's attempt to relate the lessons learned after spending a year answering the "bad news phone."

Specifically, this phone is a gray "Ma Bell special" connected to the Air Force Operations Center. It is used to relay information on any significant Air Force aircraft mishap. I hadn't been assigned to the Office of The Inspector General two weeks before it rang three times in one day – three fighters were destroyed and four aircrew members were killed. And that wasn't the only time it rang more than once on a single day. In 1979, it rang *94 times* for Class A mishaps.

Before coming to the Pentagon, I had been flying F-4s in USAFE and had never really been aware of how many aircraft the USAF loses a year. Here are some of the hard facts that hit me after coming from a line unit to the Air Staff.

Mishaps

When you consider that in 1950 we had 1,744 major accidents, the figure of 94 Class As for 1979 does not seem high. The USAF has made tremendous progress in reducing mishaps over the last three decades, but fatalities still occur and those people can never be replaced. Here is the record over the past 10 years:

The downward trend seems to have leveled off. So far in 1980, there is good news. As of 30 June 1980, the USAF had a 2.1 Class A Mishap rate. The "phone" has been relatively quiet this year, although it rang many times in July. Let's hope it stays quiet the rest of the year.

Operational Mishaps

As the USAF becomes more technologically advanced, increasingly it is the pilot who is the weak link in the man/aircraft interface. Functional limits *"are no longer dictated by structural considerations or by hardware limitations, but rather by the physiological and musculo-skeletal tolerances of the crewmen."* (AFISC/SEL) That insight leads into the next pointed realization.

An operations mishap is due primarily to pilot factor (i.e., midairs, control loss, flying good aircraft into the ground, etc.). It was an eye opener to learn that in 1979 operations mishaps accounted for 72

	Major Accidents/Class A Mishaps		Total Fatalities	
Year	Number	Rate/ 100,000 hrs	Number	Rate 100,000 hrs
1970	200	3.0	334	5.1
1971	141	2.5	129	2.2
1972	163	3.0	163	3.0
1973	102	2.4	90	2.1
1974	108	2.9	98	2.6
1975	93	2.8	281	8.4
1976	87	2.8	116	3.8
		Major A/C Acc. Class A Mishaps		
1977	90	2.8	89	2.6
1978	98	3.1	89	2.8
1979	94	2.9	77	2.4

News Phone

By **CAPTAIN JOHN BARRY** • HQ USAF/IGF • Washington, D.C.

percent of the destroyed aircraft. Even more worrisome was that fighter/attack aircraft contributed the majority of these destroyed aircraft (75 percent) while flying approximately 30 percent of the USAF total flying time. This is not unique to 1979. Statistics show that the number of operations-related mishaps has steadily *increased* since 1977 and is primarily driven by fighter/attack mishaps:

	1977	1978	1979
Total Operations Mishaps (All USAF Aircraft)	51(100%)	64(100%)	68(100%)
Operations Mishaps (Fighter/Attack)	29(56%)	35(54%)	51(75%)
Total Fighter/Attack Hours Flown	923,891	916,940	951,283

This is not just a safety concern. Mishaps are extreme consequences of deficiencies that are highly visible because of the obviously destructive and costly results; but, what of the less visible degradations to combat readiness?

Out-Of-The-Envelope Ejections

As the "phone" would ring week after week, I started paying attention to how many aircrew members were ejecting safely out of aircraft. After a little research, I noticed there was an adverse trend in out-of-the-envelope (O/E) ejections. Since 1976, there has been an increase in the number of ejections and a corresponding decrease in ejection survival rates, primarily due to O/E ejections. In 1979, 79 USAF crewmen ejected, the ejection survival rate was 68 percent, and there were 25 ejection fatalities. Nineteen of these fatalities ejected O/E. It is true that many were operating in an environment which did not allow much time for assessment of the problem and ejection decision, but evidence indicates that seven of the 19 O/E ejections in 1979 involved unnecessary delays of 5 seconds or more. Timely ejection decisions probably would have increased the survival rate. This adverse trend has continued in 1980. As of 31 May 1980, there have been 25 ejections, 11 fatalities, and 10 of the 11 fatalities were O/E. That figures to be a 56 percent ejection survival rate, the lowest in five years. Here are the last five year's statistics:

EJECTION SURVIVAL RATES
1976 - 1980

Year	Total	Survived Number	Survived Percent	Fatalities O/E	Fatalities Other
1980 (As of 31 May)	25	14	56	10	1
1979	79	54	68	19	6
1978	79	63	80	11	5
1977	70	54	77	12	4
1976	64	50	78	8	6

With more realistic training and flying in less forgiving environments, we fighter jocks must be prepared for the split-second decision-making necessary to avoid O/E ejections. During peacetime, the ground is our enemy.

The observations that I've made in this article are not earth-shaking revelations; in fact, most of what has been written here has been disseminated throughout the Air Force. However, the intent was to put some of the mishap information in perspective so that others like me might have a better understanding of where we stand. It's not the "big picture" but it may serve as a quick glance. My next tour is in fighters again, and beside trying to be the most combat-ready fighter pilot in the USAF, I'm going to ensure I'm not a conversation topic on the "bad news phone." ■

About the Author

Captain Berry is an honor graduate of the Air Force Acacemy, 1973, and spent six years as a fighter pilot before being assigned to the Office of the Inspector General in an ASTRA assignment. He was an instructor pilot in the F-4E, test pilot in the Imaging Infrared Maverick Missile Program and William Tell pilot during the Worldwide weapons meet at Tyndall AFB in 1978.

Good Instruments= Good Insurance

By BRIGADIER GENERAL LELAND K. LUKENS
Director of Aerospace Safety

■ Over the last 19 months, we have experienced 13 Class A mishaps where instrument conditions were involved. Twelve of these were fighter/attack/trainer mishaps. These unfortunate and unnecessary losses cause me deep concern, so I want to pass some of my thoughts along to you, the flyers, in hope that they may help.

Three problems were players in one way or another in these mishaps. First, the pilot found himself in an unusual attitude and either did the wrong thing or did nothing until it was too late. Second, for some reason the pilot was distracted and did not pay attention to what the gages were telling him. Third, the pilot apparently made an instrument procedural error, placing his aircraft in an unusual position and could not recover.

We old timers remember the concentrated doses of instrument training we received back in primary and basic pilot training. It was hard, dedicated instrument work but necessary for survival in single seat fighters. Simulators, then as today, played a part in training programs and although they cannot compare with actual flying time, there is no doubt that they have some value. They are good for increasing instrument proficiency, so use them when available and work that crosscheck.

In the good old days in combat crew training at Luke, the first thing an F-100 upgrading pilot did was spend about 20 hours under the bag in the back seat of a T-Bird before he ever climbed into an F-100. Then about halfway through his fighter checkout, he returned to the instrument squadron for 9 more hours of concentrated instrument work under the hood in the back seat of the F-100F.

With the present cost of JP-4 and other flying time constraints, I'm afraid those days of postgraduate level instrument training are gone forever. Unfortunately, the requirement to fly precision instruments is with us today more than ever. Today's fighter pilot is flying higher performance all-weather systems and more night low level than ever before. The best way to ensure your proficiency is to take advantage of every "spare" moment of flying time available to practice basic instrument approaches and procedures. Practice your crosscheck. Be critical.

Demand a precision performance of yourself. It's good insurance and when the time comes that you need that proficiency— you'll have it. ■

☆U.S. Government Printing Office: 1980—683-214/12

UNITED STATES AIR FORCE

Well Done Award

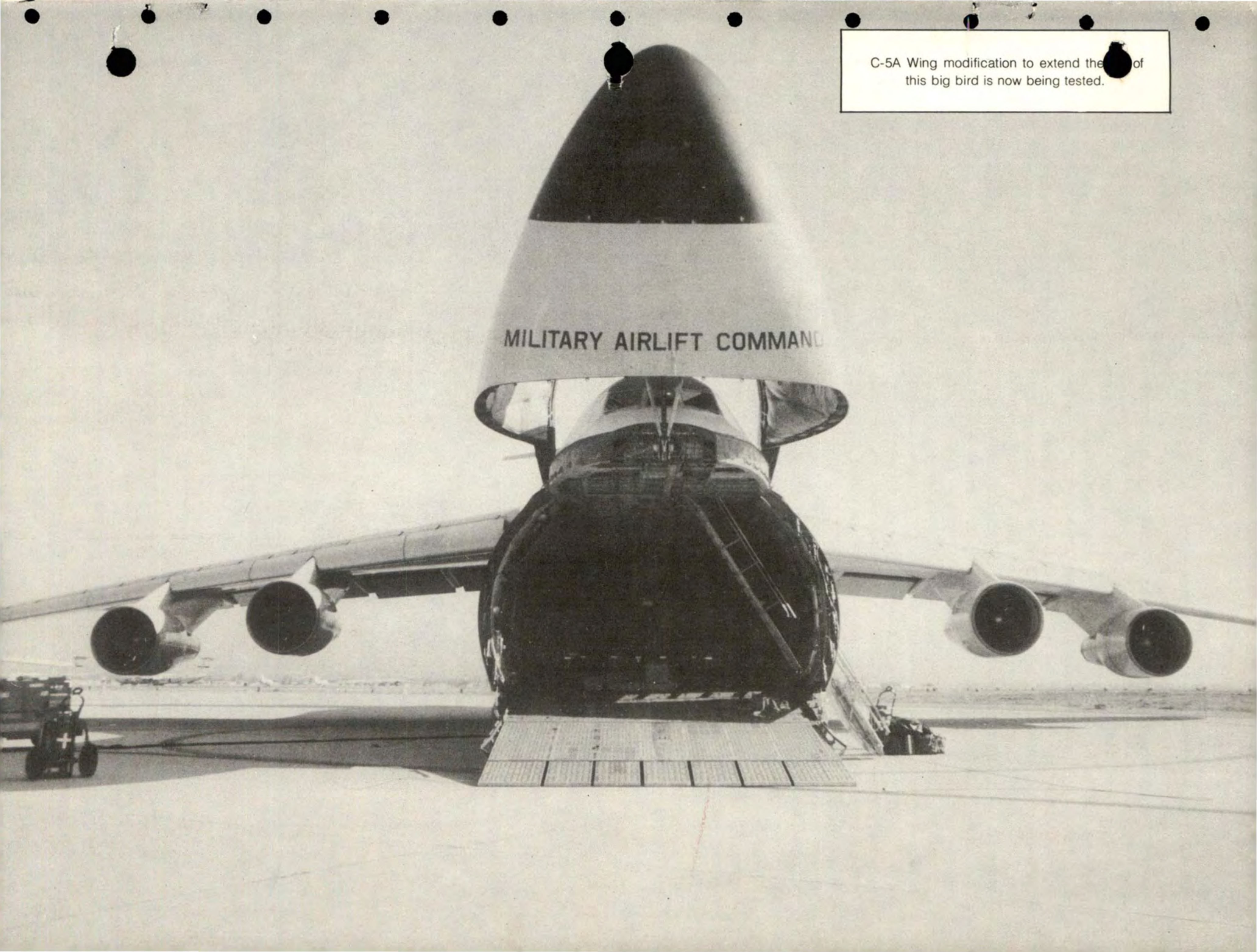
Presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Accident Prevention Program.

Captain

Jon A. Bisher

4018th Combat Crew Training Squadron
Carswell Air Force Base, Texas

■ On 25 January 1980 Captain Bisher and his instructor crew were flying a CCTS crew training mission in a B-52D with a student crew and had returned to Carswell to accomplish scheduled local transition training prior to the final landing. After approximately one hour of routine pattern work, Captain Bisher had his student pilot practice a flaps up approach. Following this approach, Captain Bisher, occupying the copilot seat, took control, entered the visual pattern, and configured the aircraft for a normal, full stop landing. Control was then returned to the student pilot to make the landing. While the aircraft was turning from base to final, Captain Bisher began to ''sense'' an excessive sink rate even though the student pilot was flying the correct airspeed at the time. Not knowing exactly what was wrong, but certain that something was seriously amiss, Captain Bisher took control of the aircraft and executed a go-around. The aircraft was approximately 500 feet above the ground when the go-around was initiated. Constantly changing stabilizer trim requirements and accompanying airspeed changes soon led to the discovery that the wing flaps were cycling without command between the full down and the full up position. Because of the large Fowler flaps on the B-52, the difference in flaps up and flaps down stall speed is approximately 30 kts. Had Captain Bisher not acted promptly turning final he would have ended up below his stall speed with insufficient altitude to recover. His recognition of the situation was even more notable because he was not actually flying the aircraft. After reaching safe altitude and airspeed, the normal flap control circuit breaker was pulled when the flaps reached the full down position. This removed power from the flap circuitry and the flaps remained full down. A normal full stop landing was made without further incident. Post flight inspection revealed FOD in the flap control actuator which would not allow power to be removed from the ''up'' side of the actuator. This allowed an uncommanded flaps up signal to be sent continuously to the flap drive motor. Had Captain Bisher not felt or sensed an abnormally high sink rate and taken immediate corrective action, a catastrophe most likely would have occurred. He clearly demonstrated superior professionalism and airmanship throughout this emergency. WELL DONE! ■



C-5A Wing modification to extend the [illegible] of this big bird is now being tested.