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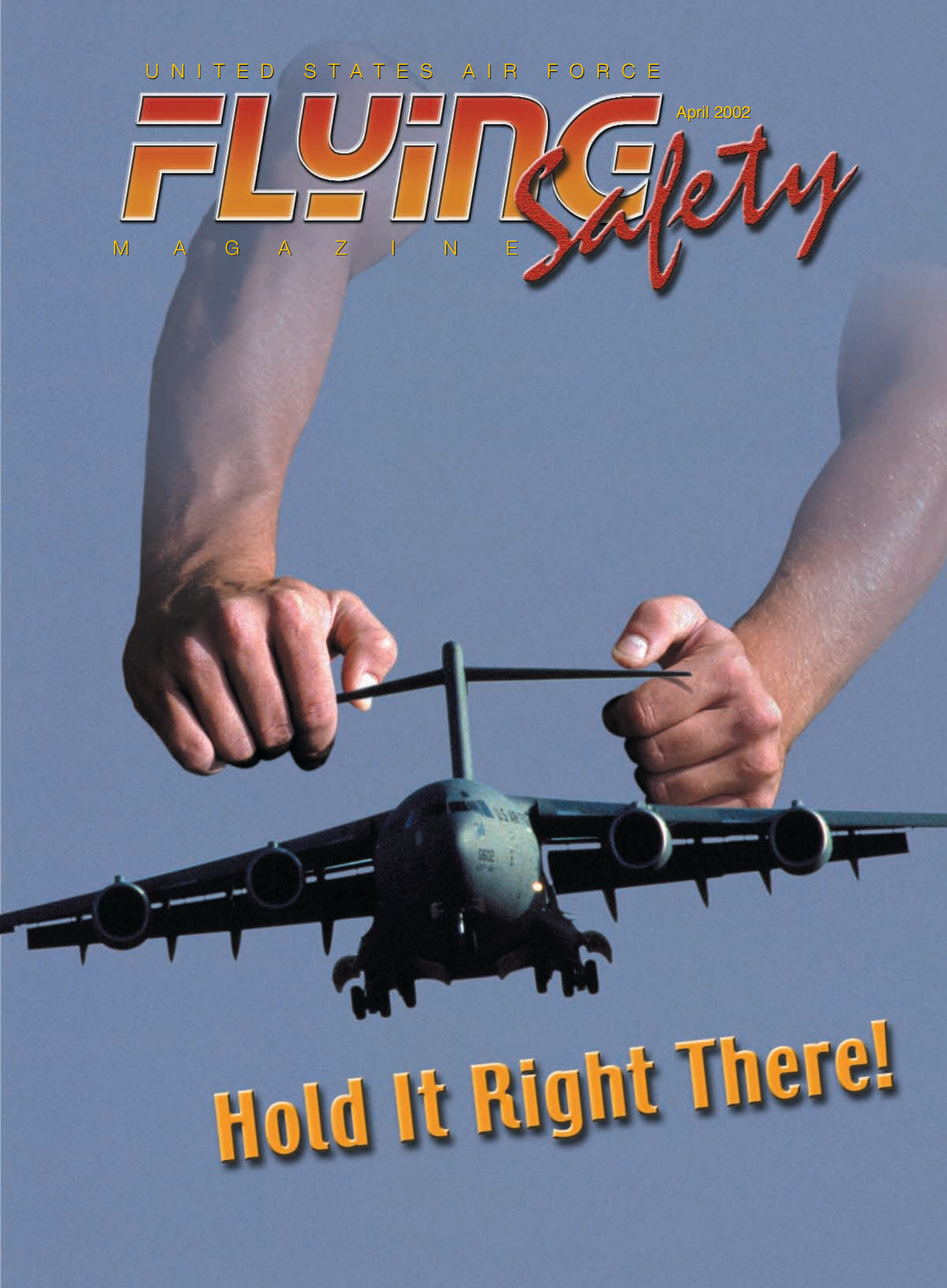
FLYING Safety

MAGAZINE

April 2002



Hold It Right There!

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This Issue:

4

12

24

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UNITED STATES AIR FORCE
FLYING Safety
MAGAZINE

GENERAL JOHN P. JUMPER
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COL MARK K. ROLAND
Chief, Safety Education and Media Division
Editor-in-Chief
DSN 246-2968

JERRY ROOD
Managing Editor
DSN 246-0950

CMSGT JEFF MOENING
Maintenance/Technical Editor
DSN 246-0972

PATRICIA RIDEOUT
Editorial Assistant
DSN 246-1983

DAN HARMAN
Electronic Design Director
DSN 246-0932

TSGT MICHAEL FEATHERSTON
Photo Editor
DSN 246-0986

Air Force Safety Center web page:
http://safety.kirtland.af.mil/
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Commercial Prefix (505) 846-XXXX
E-Mail — jerry.rood@kafb.saia.af.mil
Address Changes —
patricia.rideout@kafb.saia.af.mil

24-hour fax: DSN 246-0931
Commercial: (505) 846-0931

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THE CHIEF OF SAFETY, USAF

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FSM notams

Hail and Farewell

The baton is passed. Effective with this issue of Flying Safety magazine (FSM), CMSgt Jeff Moening takes over as your new Maintenance/Technical Editor. You'll find Chief Moening supremely qualified to be your Maintenance advocate here at the Air Force Safety Center. A 2A300 by trade, he possesses an incredible wealth of experience in the bomber, tanker, fighter, special ops and rotary wing aircraft worlds. He has also held key positions in the Log Group, the Ops Group, been a Chief of QA and served in a headquarters slot (that *is* a plus!).

Even more than those qualifications though, I've known Chief Moening since 1995 and believe you'll discover quickly what I already know: He's as fine a Maintainer as you'll find anywhere. Please keep him in mind when you have info—good, bad or otherwise—that will benefit your fellow Maintainers and keep them safe. E-mail him your words and ideas and he'll work with you to ensure they're given widest exposure in FSM.

As for me, 30 years service is all the US Air Force will allow. In particular, this final assignment has been one of my most interesting and enjoyable tours. To all of you I've met, worked with and learned from these last four years, both within and outside the Air Force Safety Center: I couldn't have done this job without you. Thanks! It has been a terrific ride!

As I move on to the next chapter, I look back and find the good memories outweigh the bad ones a thousand times over. All I can think of are the great people, places and experiences; finally "growing up;" and the privilege to have served our great country in uniform. Whether you do one hitch or a career, I hope you too can look back when it's over and feel the same.

My personal "Thanks" to every one of you who continues to serve our nation. I'm honored to have worn Air Force blue and served beside you, and render a final, smart salute as you continue to defend our freedoms. The baton *is* passed.

Chief Mike Baker
Outgoing Maintenance/Technical Editor

How To Hold Without Losing Your Grip

Those speeds are very real. Knowing how and when they apply is the key to operating safely.

MAJOR JAMES L. TAYLOR
12 OG/AIS
Randolph AFB TX

If you've looked at AFMAN 11-217, *Instrument Flight Procedures*, lately, did you notice anything interesting? Chapter 10, paragraph 10.3.5.1, says the maximum holding speed at and below 6000 ft is 200 knots and "*Do not exceed the maximum holding speed listed…*" Does that really apply to everyone? How about aircraft like the T-38 with a tech order holding speed of 250-265 knots? Does having Cat E minimums on the plate have any effect on those holding speeds? Well, let's see if we can put our arms around these and figure out how we can avoid a controlled flight into terrain (CFIT) in a holding pattern. We'll break this down into two parts: (1) How to apply the airspeed rules, and(2) How much airspace you are dealing with in a holding pattern.

Part I—Just what do I do with all this airspeed guidance?

Holding is a hot topic these days. The Advanced Instrument School (AIS) has received numerous questions since the release of the new AFMAN 11-217 (dated 29 Dec 2000) regarding para 10.3.5. This paragraph has an eye-opening list of maximum holding airspeeds that have caught some pilots by surprise. Those speeds are very real. Knowing how and when they apply is the key to operating safely. Let's start with a little history lesson.

From 1961 to 1989, the maximum holding speeds for civil turbojet aircraft engaged in level or descending IFR flight operations (from *Air Line Pilot*, Feb 1994) were as follows:

- 200 KIAS from the minimum holding altitude through 6000 ft MSL
- 210 above 6000 MSL through 14,000 MSL
- 230 above 14,000 MSL

Climbs in holding were authorized 310 KIAS (250 below 10,000 MSL, where applicable).

230 KIAS at higher altitudes was just too slow for a clean, heavy aircraft like those typically used in transport. So in 1989 the FAA increased the airspeeds to 230 KIAS at and below 14,000 and 265 KIAS above 14,000. Unfortunately, they

USAF Photos by SSgt Jeffrey Allen and Dan Harman
Photo Illustration by Dan Harman

didn't change the size of the holding patterns to accommodate those new airspeeds. Those patterns previously designed for 200 KIAS were now being flown at 230 KIAS. Pilots were playing Russian Roulette in those patterns. The Air Line Pilots Association (ALPA) caught onto this problem and issued Safety Alert Bulletin No. 93-6 "Maximum Authorized Holding Speeds for Turbojet Aircraft." It stressed that it may not be safe to hold at 230 KIAS at 14,000 MSL and below.

That problem has been rectified and the current FAA Order 7130.3A, Holding Pattern Criteria, now specifies holding patterns based on the airspeeds listed in the table in AFMAN 11-217. In addition, the FAA order contains a table listing recommended holding speeds for various military aircraft, should the designer be interested in designing the holding pattern to accommodate those aircraft. AFI 11-230 (the supplement to the TERPs manual, AFMAN 11-226) stipulates that all AF-designed holding patterns will be designed for a maximum holding speed of 310 knots at all altitudes. As with anything, there are exceptions, and those will be noted in the procedure.

So, where does all that put us today? As with anything…it depends. It is sometimes difficult to discern just exactly what standards were applied when the holding pattern was designed. If the holding pattern was designed by the Air Force, the holding airspeed can be considered to be 310 KIAS maximum, unless indicated otherwise in the procedure. If the FAA designed the pattern, it would be wise to apply those airspeeds now listed in AFMAN 11-217 paragraph 10.3.5.1 and AIM Table 5-3-1, in order to be safe. The Navy designs all holding patterns for 230 knots at all altitudes, unless noted otherwise. The Army contracts the FAA to do their approaches, so civil speeds apply at Army fields. Holding patterns designed to maximum holding speeds other than standard (including those at USAF airfields not built for 310 KIAS) will be annotated with an icon on the procedure stating the maximum holding airspeed.

Pay particular attention to the wording in AIM 5-3-7 j.2(b)(3): "Holding patterns at USAF airfields only—310 KIAS maximum, unless otherwise depicted." Notice that it says *USAF* airfields. The reason is that if you are flying an approach at a civilian airfield and happen to notice that the approach has "(USAF)" at the top of the plate, there is no guarantee the USAF actually designed that approach. Take a look at the HI-ILS RWY 3 at San Angelo Regional in the High SW approach book. It says "JAL-376.01 (USAF)" at the top of the plate, so we might assume the holding pattern depicted at the IAF, RANGE, has a maximum holding speed of 310 knots since the plate says "(USAF)." This is a bad assumption. An FAA designer may have produced the procedure on behalf of the USAF (we are told that is actually the case at SJT). In that case, FAA civil holding airspeeds may have been applied; you have no way of knowing simply by looking at the plate.

Remember, AIM says USAF *airfields*. Sometimes this can be confusing as well. Take Scott or Sheppard AFBs as examples. In both of these cases, you have both FAA and USAF TERPs designers building approaches to the same field. According to AFFSA, the FAA is now

continued on next page

It is sometimes difficult to discern just exactly what standards were applied when the holding pattern was designed.

designing all of the procedures at Scott AFB, so civil rules may apply. Even at those fields, seeing "(USAF)" at the top of the plate doesn't guarantee a USAF designer built the approach (although that was probably the case). The lines get blurred. Fortunately Sheppard and Scott are very rare scenarios. At both of those fields, it might be wise to take the conservative stance if you are in doubt.

OK, so we know what the AIM, FAA Order 7130.3A and AFI 11-230 all have to say about maximum holding airspeeds. Just how does Joe Pilot apply all this newfound information? First, start by applying the guidance in AFMAN 11-217 and comply with paragraph 10.3.5. If you are holding at anything other than a USAF airfield, the safest thing to do is to apply the airspeeds listed in the table, unless some other airspeed is noted on the procedure or you have specific guidance to do otherwise. A good example of this guidance is FLIP GP Chapter 5. It tells us that Navy holding patterns are 230 knots. If you are at an Air Force base (*not* a joint AF/civil field), it is safe to assume the max holding speed is 310 KIAS unless posted otherwise. If it is a joint use AF/Civil field, it would be wise to play it safe and fly civil holding speeds unless the procedure is annotated with higher airspeeds, regardless of whether it says "(FAA)" or "(USAF)" at the top of the plate. If the standard or posted holding speed is too slow for your aircraft, simply ask for a faster holding speed from ATC. In almost all cases, it will be granted unless there are legitimate airspace or obstacle concerns. If you find yourself arriving at a holding pattern while NORDO, IMC and unable to coordinate for faster holding speeds, you need to figure out some way to apply the standard holding speeds while in the pattern. That may mean slowing and lowering flaps, or something similar.

By the way, it should be apparent now that seeing category E minimums on the bottom of the plate has nothing to do with the holding airspeeds designed into the procedure.

If the standard or posted holding speed is too slow for your aircraft, simply ask for a faster holding speed from ATC.

Part II—How much airspace are we talking about?

AFMAN 11-217 paragraph 10.4.1 says this about entering the holding pattern: "The aircraft must cross the holding fix, turn outbound and remain within the holding airspace." This begs the question, "Just how do I tell if I remain in holding airspace?"

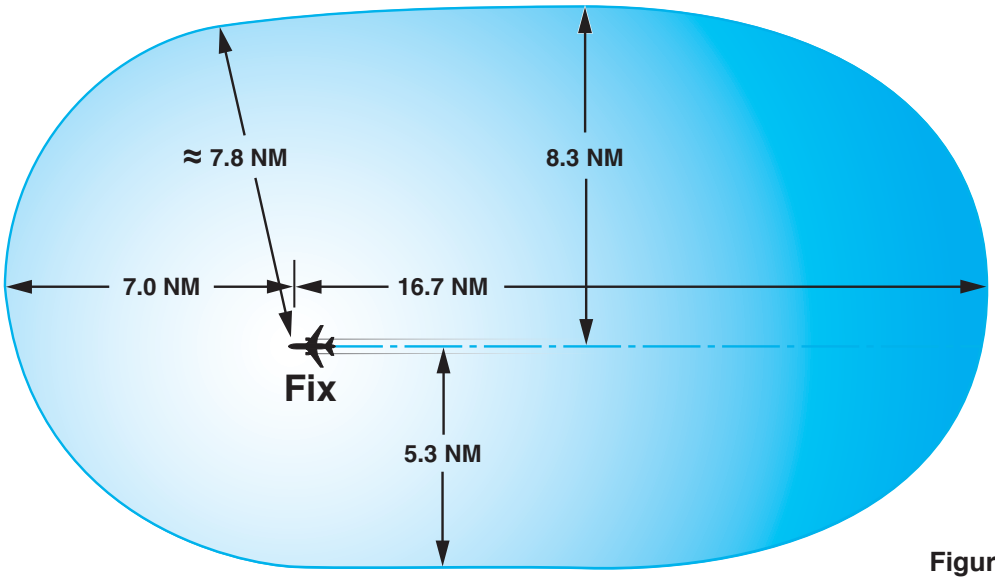


Figure 1

Let's look at Figure 1. This is a depiction of one of the templates used by an approach designer to draw a holding pattern (numbers from FAA Order 7130.3A). This template is used for a holding pattern at 8000 feet MSL, 230 knots and a holding fix from between 15 DME and 29.9 DME from the NAVAID, a fairly typical holding pattern.

The outline defines the primary obstacle clearance area. There is the standard 1000 feet of obstacle clearance (2000 feet in mountainous areas) inside the out-

lined area. In addition, outside the primary there is a secondary area that is the same shape but 2 NM larger all the way around. The obstacle clearance in this area would begin at 500 feet and taper off to zero feet at the outer edge. The distances shown on the figure (from Table 3 of 7130.3A) are there to give you an idea of the exact size of this particular holding area.

As you can see, the overall area is quite large, and the area on the maneuvering side is larger than on the non-maneuvering side. The maximum DME leg length allowed in this particular pattern is 8 NM. The length of the pattern on the holding side of the fix is 16.7 NM. So there is obviously some slop built in there somewhere. Why so much extra space?

Well, some assumptions are taken when designing the size of the holding airspace. First, there is system error; ± 5 degrees is allowed for the ground station error, airborne equipment error (VOR/TACAN receiver) and pilot error. At 15 DME, that equates to approximately 1.3 NM of displacement at the fix. Second, there is an allowance to ± 10 degrees for full scale CDI deflection; that's another 2.65 NM at 15 DME. Third, there is six seconds of reaction time added for the pilot to recognize fix passage. Lastly, there is a wind allowance of 50 knots starting at 4000 MSL and increasing by three knots every 2000 feet; that's 56 knots of wind at 8000 MSL. This wind is applied in the most detrimental direction at all points in the pattern. There is an allowance for the "cone of confusion" if the fix is overhead a station, but it doesn't apply in this example. If we were to discuss a holding fix that is directly over a VOR, the numbers would still come out very close to the ones I'm using.

Let's take a look at the holding pattern, apply the assumptions and see how an aircraft flying at 230 KIAS would do in this pattern. At 230 KIAS, 8000 MSL the TAS is approximately 260 knots on a standard day. That gives a turn radius of approximately 1.7 NM. If the aircraft hits the holding fix tracking directly down the radial inbound and turns using 30 degrees of bank in the direction of holding, its turn diameter will be 3.4 NM. In addition, the aircraft might be off by 1.3 NM (system error) at the start of the turn and that 56 knot wind will blow it another 1.5 NM during the turn. That totals up to 6.2 NM of displacement from the holding fix when the aircraft rolls wings-level outbound (see Figure 2, track A).

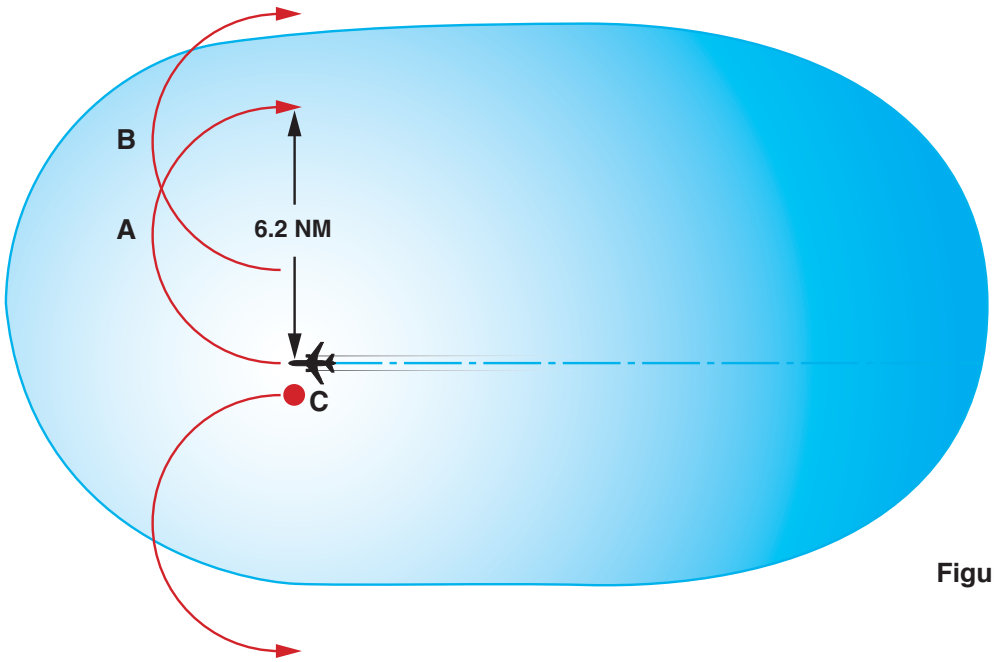


Figure 2

Notice from Figure 1 that the primary area is approximately 7.8 NM wide abeam the fix; the aircraft is still inside the template. What about the ± 10 degrees allowed for full-scale CDI deflection? Well, it should be obvious that hitting the fix dead-on is the way to go. However, if you happen to be offset to the maneuvering side of the pattern and subsequently also turn into the

continued on next page

Plus or minus 5 degrees is allowed for the ground station error, airborne equipment error and pilot error.

direction of holding, you are going to find yourself displaced more than 6.2 NM when you roll wings level (Figure 2, track B). Exactly how much will depend on how far off course you were at the turn. If you were displaced a full 10 degrees, that would equal approximately 2.6 NM of displacement at 15 DME. Add that 2.6 NM to the original 6.2 NM and you are now 8.8 NM displaced from the fix. Keep in mind that the primary holding area only went out to approximately 7.8 NM at this point in the pattern. You are a mile into the secondary obstacle clearance area of the holding pattern…still safe, but your margin of error is shrinking fast! If you apply appropriate wind-drift corrections for the remainder of the pattern, you will remain inside of the secondary protected airspace. If you let the wind continue to blow you off course, you may be outside of the secondary area when you begin the turn inbound.

You could legally hit the fix and turn any direction you want, but is that wise?

If you are displaced to the nonmaneuvering side of the pattern (Figure 2, Point C), you had better think twice before turning left; you'll fly outside protected airspace if all the negative factors are working against you. Furthermore, AFMAN 11-217 paragraph 10.4.1 doesn't require you to apply the time-tested holding entry rules we all grew up with: "within 70 degrees, turn in the direction of holding." You could legally hit the fix and turn any direction you want, but is that wise? If you hit the fix as in the first example and turn left instead of right, you will go .9 NM outside of the primary holding airspace if all the negative factors are working against you. Is a left turn in that case ensuring you remain within holding airspace? No.

You can swing those turn arcs around to simulate entering the pattern from various different angles over the fix, but all of them will fall inside the paths in Figure 2 by some degree.

We could continue along these same lines and analyze the other end of the pattern. The short of it is this: With all the negative assumptions at play, if you are flying a DME holding pattern and turn inbound at the correct DME (in the above examples that would be 23 DME), you will swing out to just over 26 DME (turn radius, winds and a late turn due to standard 3% DME error) before your turn starts bringing you inbound. The farthest point in our example pattern is out to 31.7 DME; plenty of room. If you do a timed pattern in this example, you would have even more room because a one-minute pattern would equate to less than an 8 DME holding pattern by over two miles.

Wrap it Up

I hope all this techno-babble puts the new guidance in AFMAN 11-217 regarding holding airspeeds into focus. In the above exercise, if you entered that very same pattern at 265 knots instead of 230, you could easily find yourself outside of protected airspace if all the factors came into play at once. It's critical that you adhere to the appropriate airspeeds.

Additionally, you'll notice that AFMAN 11-217 paragraph 10.4.1 says, "The aircraft must cross the holding fix, turn outbound and remain within the holding airspace." That is all it has to say with regard to what is procedure. Para. 10.4.4 talks about the standard entry "techniques." If you choose not to use those techniques, you had better have full and complete situational awareness of where you are in space and where your turn will take you. A wrong turn could spell disaster. Hopefully, the discussion above gives you an example of just how big that "holding airspace" really is and what you need to do to ensure you remain within it.

My recommendations:

1. Do a good fix-to-fix, and nail the holding fix.
2. Apply known wind corrections, and be conservative.
3. *Do not* fly faster than the pattern is designed for, unless you have ATC monitoring and permission to do so.
4. Don't freelance the entry. Know where you are when you enter, and enter in a calculated manner (the techniques in AFMAN 11-217 work well, as do the holding entry diagrams on the IAP). If you're flying ICAO, apply the ICAO entry procedures (para. 23.5.4).
5. Apply the holding speeds listed in AFMAN 11-217, if you aren't sure what speeds apply, regardless of what your T.O. says. Exceptions are USAF airfields (310 knots) and Navy (230 knots unless posted otherwise).

Fly safe! ✈

BASH: BASH Program–It Works!

BIRD AIRCRAFT STRIKE HAZARD

MAJ FRANK "SPONGIE" STEPONGZI
Flying Safety Officer, deployed

BASH—just another Air Force program that looks good on paper, or a program that really works? I have seen first hand how well this program works and I would like to share my experience with you.

I arrived at our deployed location, a small island with an airfield operated by the U.S. Navy, planning to be a copilot on a crew. Within a few days, I was commandeered by the wing commander to become the deployed chief of safety. My number one priority from the wing commander was to reduce the bird strike hazard.

We had observed an overabundance of Cattle Egrets on the airfield upon arrival. Within the first three weeks of operations on this island, we sustained 16 bird strikes on deployed and transient aircraft, including a C-5 that aborted a takeoff and was grounded for 10 days after ingesting an egret into an engine. This bird strike rate was unacceptable.

My first task was to check with our host unit, the U.S. Navy, to see what their BASH program looked like. The Navy recently created a BASH program, and it even looked good on paper. But despite their efforts, hundreds of Cattle Egrets grazed around the airfield each day creating a dangerous situation for aircraft and crews.

I looked at grass cutting on the airfield. The airfield grass was well-maintained but cut too short, around five inches. I met with the Navy and requested that they maintain the grass from seven to 14 inches as recommended by the Air Force (and the Navy's own BASH plan).

Next, I looked at the use of non-lethal and lethal means to deter birds. The Navy had five propane cannons, with only four in operation. In addition, the Navy does not use pyrotechnics such as bangers or screamers. The cannons were ineffective since depredation was used minimally. Depredation became the focus of our BASH program.

They were tasked to conduct depredation and routinely accomplished this three to four times a week. They shot over 350 egrets in the five months prior to our arrival. However, the birds remained on the airfield and were not easily scared off. With help from the Air Force Safety Center's BASH expert, Gene LeBoeuf, we changed our depredation tactics and increased the harassment of these birds. They checked out our safety office and security forces in depredation procedures to augment their shoot team.

Instead of depredating three to four times a week, we initially conducted depredation three to four times a day. This pressured the egrets to seek new food sources since it was now too dangerous to feed at the airfield. In time, it became increasingly harder and harder to get close enough to these birds to shoot them—they were learning. After just a few days, the egrets would leave the airfield when the safety truck drove within a thousand feet of them. Our first month of shooting, we depredated 169 egrets. Our second month, this number dropped to 74. Fewer and fewer egrets were feeding on the airfield and would easily scare away. The program was working. Our bird strike rate dropped 95% within a month!

My daily routine now starts with a morning drive down the runway and taxiway to chase off the few flocks of egrets that have come to feed. Instead of several hundred egrets, generally only 40-50 egrets are observed at a time. The egret population was not seriously reduced; they have just learned to stay away.

Our long-term plan includes the use of non-lethal pyrotechnics and additional propane cannons to simulate our shotguns. This will allow us to spend less time chasing egrets away, as well as leave us less paperwork reporting our bird strikes. If the birds get wise to our tactics, the occasional use of depredation will remind them to stay away.

Bottom line: The Air Force BASH program works. You just have to use it and modify it to fit your particular bird problem.

BASH: The Year In Review And A Spring Reminder

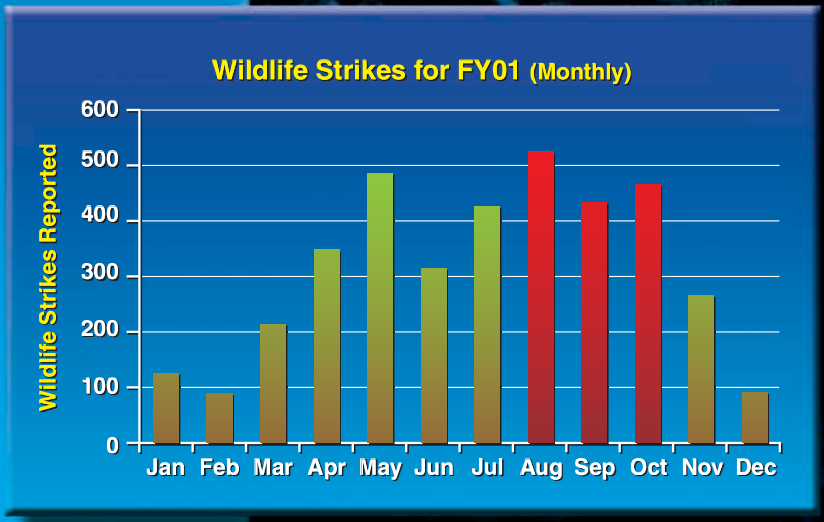
BIRD AIRCRAFT STRIKE HAZARD

Nearly 50% of all wildlife strikes this past fiscal year occurred in the airfield environment.

2D LT MATT GRANGER
2D LT DONNAVAN SWABY
HQ AFSC/SEFW

With spring in the air, people are flocking to the beaches and other resort destinations while training and operational missions continue. Likewise, nature is coming alive once again. Hibernators are awakening, the flames of animal romance are roaring, and our feathered friends are returning from their winter vacations in the warmer climates. But before we look at the wildlife hazards associated with the upcoming spring migration season, let's briefly journey back into the past fiscal year to see what happened in the world of Bird/Wildlife Aircraft Strike Hazard (BASH).

In FY01, there were 3854 wildlife strikes reported at a total cost to the Air Force of $31,950,074.49 in damage. That's an average of $8290.10 per strike. Although this shows our strike numbers to be increasing, it may be attributed to better reporting procedures or increases in wildlife populations, rather than the mere fact we are hitting more birds. We cannot be sure about the reason until we have more Safety Automated System (SAS) collected data to compare against. By number of strikes alone, our Top Five "big-hitters" from the past year were, in order, American Mourning Doves, Horned Larks, Barn Swallows, American Cliff Swallows and American Robins. In addition, nearly 50% of all wildlife strikes this past fiscal year occurred in the airfield environment, which matches exactly with our historical average.



August, September and October were our busiest consecutive months. In these three months alone, the Air Force reported a total of 1442 strikes causing $1,328,749 in damage, which is slightly less than FY00 totals for the same months (1485 strikes at a cost of $1,808,226.76). These specific months directly coincide with the fall migration season when mother goose and her "unlearned" young fly south for the winter, along with many other species of birds. As a result, the potential for damaging strikes to aircraft increases as well.

This brings us to the present. Historically, spring is a time of increased BASH activity due to the biannual migrations of our feathered friends. Migrating birds will be flying north, returning from yet another winter spent in the milder climates of the south. Your base should have had, or be planning for, the semi-annual Bird Hazard Working Group (BHWG) meeting to plan for this increase in bird activity. According to the USAF BASH Team Chief, Mr. Eugene LeBoeuf, "The BHWG is the best opportunity for all the

diverse groups who have anything to do on or near the airfield to sit across the table from one another to discuss any plans that may affect flight operations… If you are a tenant sharing the airfield with civilian operations, it is a good time to schedule a meeting with their operations office to discuss their protocol for dealing with wildlife hazards." Communication among the many different agencies operating both inside and outside the gates of your base is the key.

Please use vigilance as you prepare to schedule and fly. This is a great opportunity to get online and check out the latest in bird avoidance tools to aid you and your base. These programs, continuously updated and available for your use, include the Bird Avoidance Model, the Avian Hazard Advisory System and BIRDTAM, for those flying in Central Europe. As personnel prepare to PCS to their next duty station, ensure an adequate training plan or continuity folder is in place to get the new personnel "up-to-speed" on local BASH conditions and procedures. Also, check your bird harassment equipment to ensure everything survived the cold winter months and is working properly for use this spring.

For more information on how to prepare for migration seasons, read Mr. LeBoeuf's article "BASH: An Autumn Reminder" in the October 2001 issue of *Flying Safety* magazine. You can also find a plethora of information on our Website, http://safety.kirtland.af.mil/AFSC/Bash/home.html, such as a strike history statistics page if you are interested in even more in-depth analysis of these critical migration seasons. And of course, you may always contact any member of the Air Force BASH Team via the Web site to request more specific data and answer any questions you may have.

The simple message here is to be proactive and persistent in your BASH management programs and help eliminate damaging wildlife strikes Air Force-wide. As noted earlier, nearly 50% of all wildlife strikes this past year occurred in the airfield environment, an environment you have the most control over. The goal of all safety programs is to improve safety while maintaining operational capability. A wise person once said, "We cannot eliminate the wildlife in and around the airfield, but by being prepared and vigilant we can reduce the hazard."

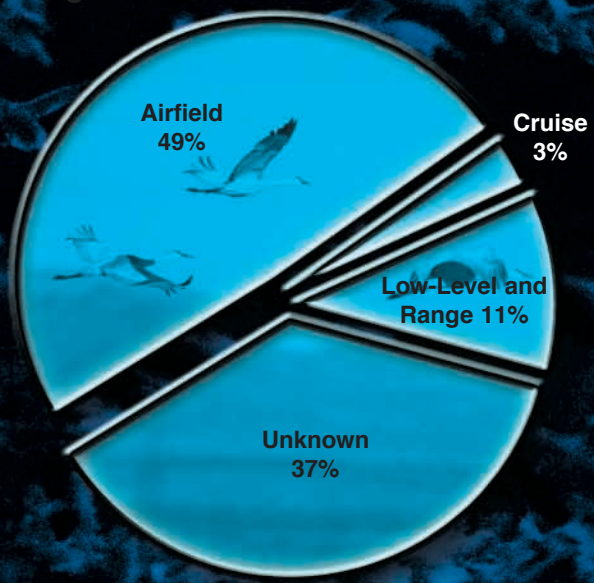
Top 10 Wildlife Strikes Counts (FY01)

Common Name	No. of Strikes
American Mourning Dove	123
Horned Lark	100
Barn Swallow	83
American Cliff Swallow	55
American Robin	55
Chimney Swift	50
American Kestral	50
Common Swift	39
Killdeer	32
Red-Tailed Hawk	28

Top 10 Wildlife Strikes Costs (FY01)

Common Name	Total Cost
Double-Crested Cormorant	$19,613,193.00
Lesser Scaup	$2,756,335.36
Ring-Billed Gull	$1,666,494.74
Black Vulture	$1,143,044.43
Caspian Tern	$845,876.74
Red-Tailed Hawk	$741,828.46
American Kestral	$398,421.00
Gadwall	$342,999.08
Canada Goose	$273,265.00
Song Sparrow	$184,645.62

Flight Phases of FY01 Wildlife Strikes



Mishaps, Media and You

Illustration by Dan Harman

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HQ AFSC/JA
LT COL DAVID C. TALLEY
SAF/PAN
CMSGT JEFFERY A. MOENING
HQ AFSC/SEMM

Your day starts out great with a short flight for some fun flying. Then things go wrong fast and the next thing you know you are floating down at the end of a parachute. As you look in the distance you see your "fun ride" impacting the earth below. After safely landing and ensuring all your body parts are still intact, now what? You see the neighborhood farmers and the local law enforcement officials coming to your aid, followed closely by the media. You know Safety and Accident Investigation Boards (SIB/AIB) will be convened and your actions and comments are going to be questioned. However, your first dilemma is that you have a local reporter, with camera crew in tow, sticking a microphone in your face. What do you say? What do you do? What happens if you give an interview? What are you legally required to do? Even you, the aircrew member, have rights when it comes to an interview, and here are some pointers from SAF/PA.

In interviews of a spontaneous nature, such as described above, you have the right:

- To just say no.
- To know who is interviewing you and whom he/she represents.
- To have total agreement by both parties of the ground rules, no matter how hastily arranged.
- To be treated courteously. The questions can be tough, but the reporter's demeanor should not be abusive.
- To have "off-the-record" comments, if previously expressed, honored. (As a rule, never say anything off-the-record unless you know and trust the reporter.)
- To not be physically threatened or hindered by hand-held lights too close or microphones shoved into your face.
- To break the interview off after a "reasonable" amount of time, but only after the important questions, as determined by you, have been answered.

Other tips that can help you are:

- Always consider yourself "on the record." *Never* say anything you don't want to see in print.
- Remember to speak the public's language; watch the acronyms and technical terms.
- Don't argue, as you won't win.
- If asked a question based on false data, protect and correct the record, and don't repeat false data or negative statements.
- Always answer honestly. If you don't know the answer, or the answer is classified or would invade someone's privacy, it's okay to say so.

Everyone wants to cooperate with the media and the Air Force has always taken a stance in line with the Secretary of Defense principles of public information and full disclosure/minimum delay standard. The key to this policy is that information is cleared by proper authority prior to release, to protect the rights of the individuals involved in the mishap. There are several Air Force instructions

dealing with media relations and Air Force mishap investigations:

- AFI 35-101, *Public Affairs Policies and Procedures*
- AFI 91-204, *Safety Investigations and Reports*
- AFI 51-503, *Aircraft, Missile, Nuclear, and Space Accident Investigations*

What do you say to the reporter? First and foremost, you are under no obligation to talk to the media, and you should ALWAYS refer the press to Public Affairs (PA). This is a simple and easy rule to remember, and when you are "alone, unarmed and under the lights," simplicity works.

Second, everything you say to the media after the accident can be used against you. Once you make the information publicly known it is available to everyone, to include the investigation boards, so stick to the facts; don't speculate.

Third, anything you say to the media cannot be taken back. What you say to the media is or can be heard by other witnesses to the event and your words may influence their statements, which, once again, could jeopardize an investigation. The Air Force needs every witness's unvarnished statement to ensure we determine the cause(s) of an accident and prevent future mishaps.

Finally, you've just done a picture perfect PLF, you are all alone, except for the strangers rushing toward you, and neither PA, the Judge Advocate (JA) nor the board president is around to give you advice. Plus, you don't have all those AFIs in your pocket. Stick to the basics! Remember, you don't have to say anything, and don't reveal anything that could later come back to haunt you. You can just say "Please talk to the base Public Affairs office."

It should be obvious, but after an aircraft accident, especially one involving property damage, injuries or loss of life, there is a legal minefield facing the aircrew member who gives an interview to the media without PA and JA help.

Aircrew and any other Air Force members should refrain from discussing any mishap as it relates to other members whose involvement has either not been established or is currently under investigation. This is prudent because your comments may mislead, confuse or prejudice the investigation. Witnesses have unique observations because they experience different elements or aspects of a mishap. If they read about what you saw or did during the mishap, they may be influenced by your testimony. That's one reason why accident investigators direct witnesses not to discuss their testimony with others.

Once a safety officer assigned to the Disaster Control Group, or an Interim Safety Board or SIB member interviews you under a promise of confidentiality, another rule kicks in. Air Force Instruction 91-204 prohibits you from identifying what questions you were asked by safety investigators or what responses you gave, or identifying any other information discussed during the interview. That prohibition is permanent. Improper disclosure can carry criminal penalties.

After the Accident Investigation Board (AIB) forms, there are more rules about the release of information. This information includes the status of search and rescue missions, recovery of remains, salvage, and the progress of the investigation. The AIB president can release information collected by the investigation to the public before the report is approved and released, but it will require convening authority (typically the MAJCOM commander) approval. JA, PA and the AIB and SIB presidents will all coordinate. If the accident involved fatalities, then nothing can be released until the Chief of Staff has approved. The information in question includes your testimony to the AIB!

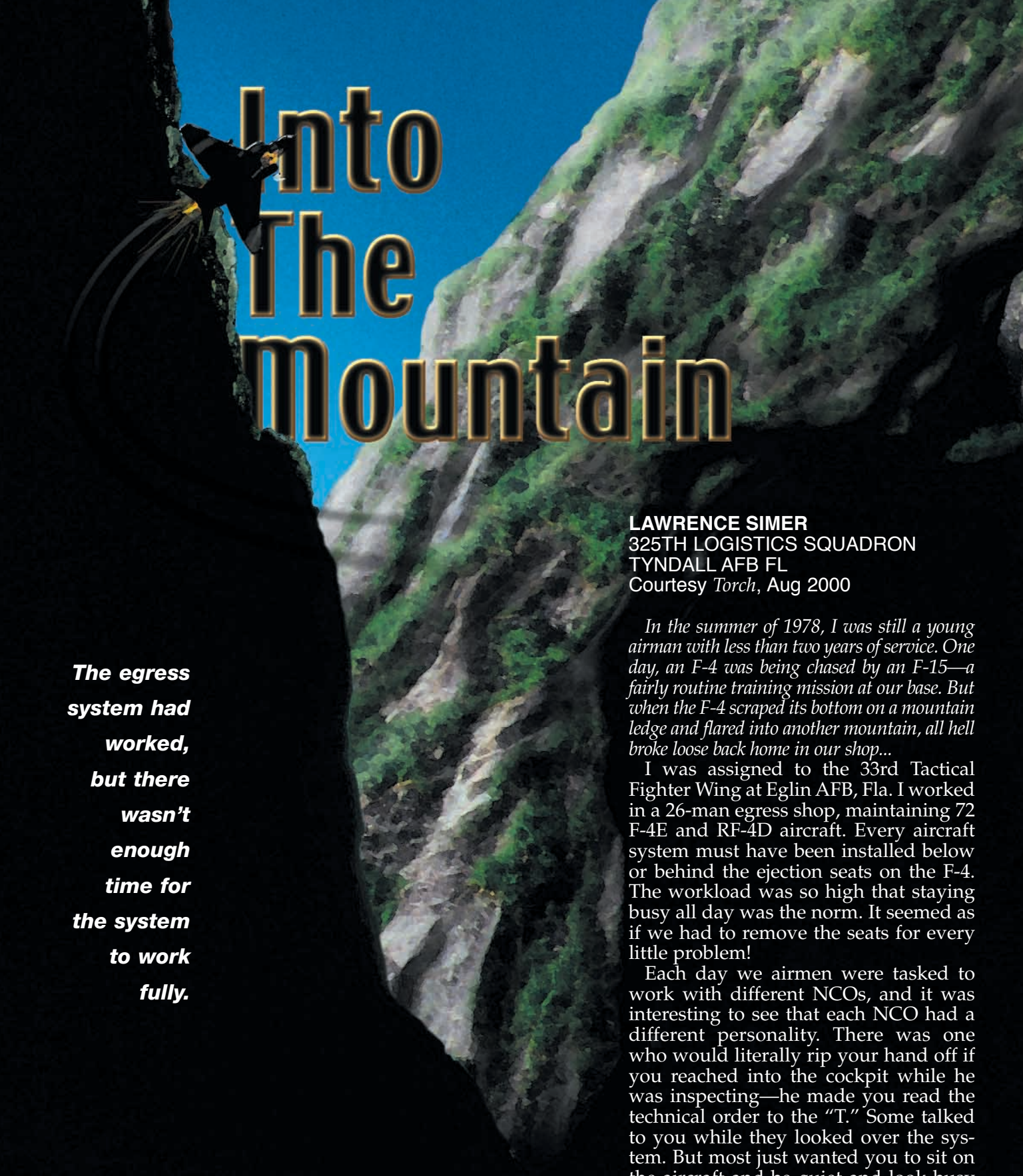
During an AIB interview, you may be given information collected by the board. Perhaps they are trying to clarify or guide your testimony, or they may be asking for your expert assistance. You are prohibited from disclosing that information without the AIB president's approval or until the AIB report is approved and released. This prohibition carries potential criminal penalties. Further, as stated above, the AIB president will direct you not to disclose your testimony to anyone until the report is approved and released.

After the AIB report has been released, you must still be careful. If there are any potential claims or litigation arising out of the mishap, the convening authority's JA must be consulted. In general, the Air Force wants to remain a neutral party in private litigation and will only allow our personnel to testify as fact witnesses in litigation after receiving approval to do so. They are prohibited from giving personal opinions or providing expert testimony unless, again, they are given specific authorization. It is also the policy of the JA office responsible for aerospace claims and litigation not to allow Air Force members to talk with attorneys, private investigators or parties involved in claims or litigation without express approval. And if you get invited to a deposition, there will be an Air Force attorney present.

Like we said…the minefield is real and extensive. Before you give an interview or make a statement to the media, here are some simple rules of thumb:

- Stay calm.
- Think before you act or speak.
- Seek guidance from your chain of command.
- If it's appropriate to give an interview, your responses should be factual.
- Never offer your personal opinion about the cause of a mishap.

Remember, your chain of command is there to help. PA and JA want to assist. Use the resources that Air Force leadership makes available to keep you out of trouble.



Into The Mountain

LAWRENCE SIMER
325TH LOGISTICS SQUADRON
TYNDALL AFB FL
Courtesy *Torch*, Aug 2000

The egress system had worked, but there wasn't enough time for the system to work fully.

In the summer of 1978, I was still a young airman with less than two years of service. One day, an F-4 was being chased by an F-15—a fairly routine training mission at our base. But when the F-4 scraped its bottom on a mountain ledge and flared into another mountain, all hell broke loose back home in our shop...

I was assigned to the 33rd Tactical Fighter Wing at Eglin AFB, Fla. I worked in a 26-man egress shop, maintaining 72 F-4E and RF-4D aircraft. Every aircraft system must have been installed below or behind the ejection seats on the F-4. The workload was so high that staying busy all day was the norm. It seemed as if we had to remove the seats for every little problem!

Each day we airmen were tasked to work with different NCOs, and it was interesting to see that each NCO had a different personality. There was one who would literally rip your hand off if you reached into the cockpit while he was inspecting—he made you read the technical order to the "T." Some talked to you while they looked over the system. But most just wanted you to sit on the aircraft and be quiet and look busy while they inspected.

Have you ever wondered why technical orders require you to follow guidelines that sometimes just don't seem to make sense? In the egress career field, a

Photo Illustration by Dan Harman

requirement exists in which two people must be involved whenever work is accomplished on an ejection system. It's called demand and response, where one person is required to read the technical order and the other person does the task. You would think that if one individual has full knowledge of the system, they should be able to do the work without that second person.

But on this day, I learned a valuable lesson on that very subject.

After the F-4 crashed, it didn't take long for Quality Control personnel to come into our shop and confiscate the maintenance records on this aircraft. The NCOs in the shop became really nervous—all but one, that is. The NCO who made us read the technical orders wasn't concerned.

When the word came that a chase plane had seen the rear canopy jettison, but did not see any chutes, the nervousness in our shop turned into open arguments and finger-pointing. For three weeks there was uneasiness in the shop as the NCOs discussed who might have signed off the last inspection and maintenance on the mishap aircraft. The fact that many of them didn't follow the demand and response requirement made those NCOs even more nervous.

Arguments and yelling became the norm, along with the high workload. The egress career field is an unusual field because day after day, week after week, month after month, and year after year the systems are worked on, but, fortunately, rarely used. Unfortunately, complacency is a real problem. Add the fact that people who do the work for many years feel they know everything they need to know and no longer feel they need the technical order to do the job, and the stage is set for a "reality check." For three weeks our shop wasn't a comfortable place to work. Finally, the accident investigation team allowed the mishap report to be read at our shop.

The weapons system officer had attempted to eject when he realized they were about to hit the side of a mountain. The canopy jettisoned and his seat was almost out of the aircraft when they impacted. The egress system had worked, but there wasn't enough time for the system to work fully. The NCOs "breathed a sigh of relief" when they found out they weren't at fault. But they endured a very intense period, because many hadn't been following the rules.

When I became an egress system inspector, I ensured that the airmen under me would remember me as one of those who made them read the technical order every time. My intention wasn't to have to remember if I did my inspections right; I intended to *know* I had done them right!

It was interesting to see the different personalities of the airmen. Some of them would read the technical order without question. Some needed coaxing—they wanted to talk. Some of them argued how senseless it was for them to have to read the technical order every time ...

The NCOs in the shop became really nervous—all but one, that is.

Mountain Flying: Skill And Know-How

Photo by LCpl Joseph Price
Photo Illustration by Dan Harman

Courtesy, Directorate of Flying Safety
Australian Defence Force

A circus performer walking a tight-rope, an artist trying to produce his best work, an athlete attempting to win a race and an aviator flying in remote mountainous areas are all under strain. The only difference is that an aviator is under more than mere stress, because his life and aircraft are at stake. While a circus performer, an artist and an athlete are tops in their fields, the aviator must top them all when he pits his skill and aircraft against the mountains. The following accident gives a bird's-eye view of some of the problems aviators face when flying in the mountains.

Before taking off in a Huey on a photographic mission in mountainous terrain, the pilot estimated his gross weight to be between 9100 and 9200 pounds. Although concerned about the amount of equipment and number of personnel on board, he performed a go/no-go check and felt he could still fly the mission safely.

When the aircraft reached the mountain range, which was about 10 miles from the takeoff point, a high recon was made and a suitable dropoff site was selected for the photographers. The copilot attempted an approach to the southeast but aborted at 50 feet AGL due to insufficient left pedal. He then made an approach to the southwest but also had to abort because of a fast rate of closure. The pilot then took the controls and landed in a westerly direction on the mesa at an altitude of about 6200 feet MSL. Two photographers got off, and the pilot then flew west about five miles to locate positions for two other aircraft.

During an approach into a proposed site, the UH-1 spun 360° to the right because of insufficient left pedal. At this time the aircraft was 20-50 feet above the ground and spinning at approximately 15° per second. The pilot lowered collective and flew out of the area. Just before the spin, it was estimated that the aircraft was pulling 45 pounds of torque.

The crew then decided to burn off fuel to reduce aircraft weight. After flying for 30 minutes, they returned to the mesa to pick up the two photographers who had completed their filming. They remained on the ground for 15-20 minutes, and the pilot kept the operating RPM at 6000 to burn off more fuel. A pre-takeoff check was made, and the aircraft was brought to a two-to-three-foot hover. Torque was just below 40 pounds, N_1 was well below the red line, and EGT was slightly over 500°C. Therefore, the pilot decided not to perform a complete go/no-go check.

A normal takeoff was made and transitional lift was reached after about 10-15 feet of forward flight. The pilot then applied forward cyclic and increased power to 42 pounds of torque to gain airspeed. The

aircraft began to settle, so a small amount of aft cyclic was applied. By this time, the aircraft had travelled 50 feet and had attained 10-15 kts of ground speed.

On approaching the edge of the mesa, the pilot felt a weak gust of wind, and the nose of the aircraft started to move right.

The pilot added left pedal, which hit the stop as the aircraft reached the edge of the mesa. The aircraft started to turn right, and the pilot tried to compensate for the situation by adding left aft cyclic. The aircraft failed to respond and spun 90° right. The nose dipped downward and the pilot applied more left aft cyclic to level the aircraft. As the aircraft completed a 360° turn, the pilot tried to reduce power but could not as he was over a slope and a drop-off. The aircraft continued to spin and began to pitch and yaw violently. The pilot rolled off throttle, and the aircraft crashed left skid low and bounced forward on the right skid.

Fortunately, neither the crew nor passengers were injured and the aircraft sustained only minor damage. However, similar accidents have had catastrophic results.

At the time of the accident, the gross weight of the aircraft was 8796 pounds, density altitude was 6100 feet, and pressure altitude was 5900 feet. The UH-1 Operator's Manual cautions about left pedal travel limitations above 5000 feet. The caution states that at high altitudes and weights where directional control is marginal, simultaneous climb and acceleration takeoffs may result in loss of control at a height and airspeed from which recovery is not possible. In addition, it states there is insufficient left pedal to maintain directional control when hovering or making takeoffs or landings in adverse winds at weights above 8300 pounds at 5000 feet and lower weights at higher altitudes. The manual also describes where directional control problems may occur when gross weight and density altitude are high. In this instance, the directional control problems associated with the UH-1 at high gross weights, high altitudes, and in adverse winds detracted from its suitability to perform its mission.

A qualified weather forecaster said that with the prevailing winds and topographic features at the crash site, the winds may have been as strong as 20-30 kts at the edge of the mesa, and wind eddies, both crosswind and downwind, probably existed. The winds at the edge of the mesa would have been approximately from the west-northwest or from 30°-80° off the nose of the aircraft, which was on a departure heading of 205°. The operator's manual states that under these conditions, marginal tail rotor control of less than 10 per cent may be available, depending on wind velocity, density altitude, gross weight and rotor RPM.

There were several causes for this accident, but the more prominent ones were inadequate training and improper supervision. Neither pilot had adequate mountain flying training or experience to fly this mission. The pilot had no mountain flying experience, and the copilot had not flown in the mountains for eight years. Although they operated in mountainous terrain, the commander failed to provide his pilots with mountain flying training and briefings. In addition, their SOPs did not address high altitude or mountainous terrain operations in accordance with prescribed procedures. Neither pilot had read or been briefed on the cautions and warnings in the operator's manual concerning the left pedal limitations under certain gross weight, density altitude and wind conditions. They disregarded these limitations during flight planning, then used poor judgment by continuing to fly without sufficiently reducing their gross weight after experiencing left pedal problems on the first two approaches to the mesa.

Because of the inadequate training, the pilot added unnecessary power to gain forward speed when taking off from the mesa, which caused loss of directional control due to insufficient left pedal.

Aircraft performance is affected by varying altitude, temperature, wind and aircraft load. In addition to knowing the direction and velocity of the wind, an aviator must vary his aircraft load to correspond with altitude, temperature and wind conditions. Because winds are extremely tricky and dangerous in mountainous areas, every effort should be made to determine existing conditions before takeoff and while en route. Weather forecasters can provide general information, but accurate information for the specific area of operation is not available through this source. In areas of operation where ground communications exist, aviators should contact those on the ground to determine the existing wind conditions.

Windsocks are the next best avenue for determining wind conditions, and
should be installed at LZs where repeated operations are conducted. Unfortunately these sources are not always available, so the aviator must use visual cues to estimate wind direction and velocity.

Next to the windsock, smoke grenades provide the most accurate indication of wind direction and velocity. In light wind, smoke will rise vertically with very little horizontal movement, whereas in strong winds it will disperse horizontally with very little vertical movement.

Unusual atmospheric conditions in mountainous areas are the rule rather than the exception. An aviator who operates in the mountains must know the capabilities and limitations of the aircraft being flown, must have acquired precision in handling the controls, and must have mastered the basic techniques of flying to the extent they are instinctive.

U-2S:

America's Eyes And Ears

Safety is, therefore, an essential component of mission effectiveness.

MAJ CORY BARTHOLOMEW
9 RW/SEF

The U-2 program had another excellent year in FY01, with only one Class C Mishap. This is a noteworthy accomplishment when you consider the operations tempo in worldwide locations.

Originally designed as a simple, high-altitude camera platform, the U-2 "Dragon Lady" has evolved into an extremely capable, all-weather reconnaissance system of astonishing versatility. The modern U-2 can carry a 4000-pound equipment payload, tailored to meet the needs of the particular mission it has been assigned. While it will still carry a variety of conventional cameras when tasked to do so, the U-2 can also mount a multi-spectral electro-optical sensor or an advanced synthetic aperture radar. The electro-optical sensor can "see" in a much broader spectrum than the human eye. And, of course, the radar can take high resolution "pictures" at night or through solid cloud decks. In addition to these imaging systems, the U-2's payload can also include a bewildering array of signal collection equipment. The U-2's high-tech hearing is every bit as acute as its vision. Depending on mission requirements, the information gathered by these various sensors can be recorded for future study or transmitted immediately to ground stations for near-real time dissemination to the users in the field.

As good as it already is, the U-2 just keeps getting better. Current upgrade programs include a new electrical system designed to allow the use of even more powerful sensors, a new angle-of-attack display and warning system for enhanced safety, and soon, an all-new cockpit full of cutting edge avionics. These improvements will allow the U-2 to remain highly effective for many years to come.

The one area of U-2 operations where technology seems to have stagnated is in the yoke actuator—the pilot. Due to the glacially slow progress of biological evolution, today's U-2 pilots are physically not much improved over the original 1950's model. True, there have been some small advances in nutritional science. But these seem to have been offset by the widespread effects of excessive junk food consumption. And despite all of the wonderful advances made to the U-2, its peculiar configuration makes it a tremendously challenging aircraft to fly. For this reason, and because U-2 pilots fly high-profile sorties without the benefit of a copilot or a wingman, the 9th Reconnaissance Wing employs a rigorous interview process when considering new pilots for assignment to the U-2 program. Only highly skilled, strongly motivated pilots need apply. (For the specific requirements to apply to the U-2 program, visit the Beale AFB Web site at www.mil.beale.af.mil.) The two-week long interview is absolutely

USAF Photo by TSgt Bill Evans
Photo Illustration by Dan Harman

necessary because, although the U-2 fairly leaps off the ground and is surprisingly agile at altitudes above FL600, it takes an exceptionally skilled and extensively trained pilot to bring it safely back to earth.

Unfortunately, as the Air Force has become leaner and meaner over the last few years, the pool of qualified applicants to the U-2 program has also shrunk dramatically. And while the number of pilots available to choose from has been reduced, the requirements for hire into the program must, for safety reasons, remain stringent. This trend has made it difficult for the 9 RW to recruit as many new pilots as it needs to replace the ones it has lost to retirements, separations and PCS moves. The resultant critical manning levels coupled with a wartime ops tempo represent one of the U-2 community's greatest safety concerns. To meet this challenge, Operational Risk Management (ORM) has been incorporated into the squadron scheduling process, and ORM is addressed in every preflight briefing.

Squadron flight schedulers use the Computer Aided Aircrew Scheduling System (CAASS) to check currencies and qualifications before assigning aircrew to sorties. Individual training objectives for which the pilot is unqualified or non-current are identified. Instructor pilots are assigned, if required. Squadron supervisors then review the schedule as a "sanity check" prior to signing the flight authorization. And finally, each pilot reviews an ORM matrix during the preflight briefing. The matrix addresses issues such as pilot experience level and currency, sortie type, and weather conditions. The pilot is asked to assess his own personal abilities as well, considering such factors as stress and physiological readiness. Number values are assigned to each condition, with cumulative values above a certain level requiring the notification of squadron supervision. In many cases a sortie can be altered slightly to bring the total risk assessment number in line with the expected benefit to be achieved. Occasionally a sortie is cancelled. Of course, there are times when the risk, though high, is considered acceptable because of the overriding requirements of national security. Even then, every effort is made to mitigate the risk. The U-2 and its pilot are both rare commodities, in high demand. Safety is, therefore, an essential component of mission effectiveness, and the past few years of safety statistics show how ORM can be used to mitigate risks.

The U-2 has been called the most important development in reconnaissance tools since the invention of the telescope. Considering the contributions the U-2 has made to the security of our nation over the past 45 years, that statement may be more than just flattering hyperbole. Day in and day out for over four decades (from the Cuban Missile Crisis to the war in Kosovo) the U-2 has delivered reconnaissance products that influenced national policy and shaped world events. If the Air Force can continue to find pilots willing to squeeze into a full pressure suit, get strapped into a cramped cockpit and spend several hours flying a single-engine aircraft at the edge of its performance envelope alone, unarmed and unafraid over unfriendly territory, then the "Dragon Lady" will continue to serve as America's eyes and ears well into the 21st century.

Its peculiar configuration makes it a tremendously challenging aircraft to fly.

What's an IO To Do?

Brief the team on safety privilege, and ensure information is stored properly.

MAJ TONY MONETTI
Student, Air Command and Staff College
Maxwell AFB AL

So, you just found out you're the lucky Investigating Officer (IO) to investigate a Class A mishap, and you ask yourself, "What's an IO to do?" Here's what I learned, and hopefully the following information will make your job a bit easier.

Before Leaving Home Station

Ensure your admin folks properly annotate your travel orders to include "Variations Authorized" and a rental car. This will save you valuable time when you return. Plan to bring proper clothing requirements based on where the mishap occurred. More is better. An extra pair of boots and leather gloves are a must! AFI 91-204, *Safety Investigations and Reports*, and ACC's "Bear Traps" (lessons learned from safety boards) will be highly beneficial to read during the plane trip to the site. You can find the "Bear Traps" by going to ACC's safety web page at https://wwwmil.acc.af.mil/se/ and clicking on Flight Safety, then scrolling down and clicking on Bear Traps. Bear Traps provides a great synopsis of lessons learned from previous Safety Investigation Boards (SIB). You will benefit greatly if you take the time to read them before embarking on this adventure.

When You Get There

Upon arrival at the site, meet privately with the board president (BP). The BP should understand you're the investigating officer, and as such, you are primarily responsible for managing and organizing the investigation. As the BP, he or she holds the hammer. The BP's role is to be the final point of release for all information, including the report of findings, causes and recommendations (FCR). However, you're the school-trained, aircraft-proficient crewdog who'll help form this team and determine why the mishap occurred.

As SIB members arrive, stress the importance of security to the group. Brief the team on safety privilege, and ensure information is stored properly. Change the locks to the SIB room, and provide a key to each member of the SIB. The Interim Board (IB) should already have secured the site and preserved evidence. After conducting a hand-off briefing with the IB, begin the process of developing a team. Success in determining the reason(s) the mishap occurred is dependent upon how well members communicate and function cohesively as a team.

Think "Team"

Think of ways to develop esprit de corps. One way to break the ice is to ask each member what his or her "call sign" is. If they don't have one, assign them one accordingly, and include each mem-

HQ AFSC Photo by TSgt Michael Featherston

ber—officers, civilian contractors and enlisted personnel. Consider purchasing "Friday name tags" for each member. Meet one of Maslow's hierarchy of needs by getting a snack bar going. Also, one of the greatest motivators in team performance is for each member to feel they have a significant role in determining the success or failure of the team.

To help maximize the team's effectiveness, use each member. A key member on the team is the assigned Air Force Safety Center (AFSC) rep. Keep in mind he or she is there to help the team, not lead it. Ask the AFSC rep to conduct 30-minute training sessions during the first couple of weeks to teach topics such as interviewing techniques, definition of terms, review of tabs A through Z, etc.

As time progresses, you'll develop a sense of the strengths and weaknesses of each individual. Find ways for team members to complement each other. If you think a particular board member isn't quite up to par, get an additional subject-matter expert to supplement. Be decisive! Remember: The team has only 30 days to figure out this puzzle, write a couple-hundred-page report, write safety messages and develop a briefing for a four-star. Be creative, and think of ways to mold a balanced team that communicates effectively.

To improve communication within the group, facilitate daily meetings at a set time and location, and ensure all members of the SIB attend. To help organize the team's efforts, post a "to do" list specifically defining required tasks, OPR and completion dates. During round-table discussions, ask the recorder to document what each member has accomplished, and update the "to do" list. Whatever you do, ensure the meetings don't drag by limiting them to 90 minutes. Help foster an atmosphere that encourages open discussion that is free from retribution. Always encourage the team to look under every rock during the investigation, think "outside the box" and constantly ask the "why" question. Remember: There are no dumb questions—except the ones not asked. It may also help to plant a spy within the group to act as the devil's advocate. It's easy for the team to fall into "groupthink" scenarios—but the quiet ones usually have the answer!

The Investigation

As you continue your fact-finding efforts during the first couple of weeks, never do something you can't undo! As the sage, Mr. Mike Hannah from the Southern California Safety Institute, would say, "The truth is in the wreckage." Before you permanently alter evidence, think it through. Whatever you do, don't lose any evidence. Maintain a log on where the evidence is, who's analyzing it and what the team has learned. The evidence will be sent to various agencies across the country. The BP will provide guidance on how it gets there,

continued on next page

Remember: The team has only 30 days to figure out this puzzle.

by what method, and how it returns. It's important to have positive control of each piece of evidence.

As the results return, the facts of what is known will become clearer. To help organize the team, determine a management tool to guide the investigation. You'll discover that everyone has a "technique" on how to do this. A simple yet effective tool is to list three columns on a dry erase board: (1) What we know. (2) What we think we know. (3) What we need to know. During daily meetings, update the lists. Eventually, the facts will present themselves.

There are other tools available, such as root-cause analysis, engineering flow diagrams, etc. The key is to find one that works for the team, and then stick to it.

Writing the SIB Report

Throughout the investigation process, it will be necessary to pace the team. One technique is to ask each member to write Tabs A through S early in the investigation (i.e., during the first two weeks). It's beneficial to use a file cabinet to organize the tabs with three sets of Tabs A through Z. On the top cabinet, place the working copies of the tabs. Use the middle cabinet for refined working copies. The bottom cabinet is reserved for "finished products." Ask the BP and AFSC rep to QC each tab, in accordance with AFI 91-204. It's also beneficial to compare finished tabs with a good copy of a "white elephant" (final SIB) report. The AFSC rep will provide one for you. Use the sample as an example and not a source of plagiarism. Always ask the BP to QC all final products. The BPs aren't colonels for nothing! They're good writers and will help clean up the final product.

Write Tab T to the person who knows nothing about the mishap.

Another area to get ahead on is the formal briefing. Ask the AFSC rep to secure sample briefing slides, and ensure the BP is working on his briefing. Complete filler slides early by assigning team members to help with the appropriate slides. Remember that each member of the team is focused on his or her own specialty. Together with the BP, attempt to become intimately familiar with what each person is accomplishing.

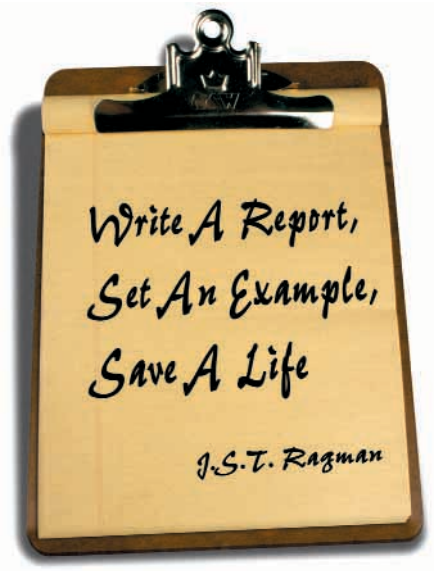
There will come a time in the investigation when the cause of the mishap will hit you in the forehead like a two-by-four. When that time comes, attempt to achieve consensus on the findings, causes and recommendations (FCR). A technique for writing FCRs is to exclude the BP from heated discussions. Ask the BP to develop his own FCRs, then compare the two. Chances are, they'll mirror each other. If not, the FCRs will be a more refined product. Correctly defining and wordsmithing the FCRs is critical—it provides the foundation of the dreaded Tab T, "Investigation, Analysis, Findings and Recommendations."

Without question, writing a quality Tab T will be the toughest thing to accomplish. Tab T consolidates all of the team's efforts and summarizes the SIB's FCRs. As you write it, remember to SAVE, SAVE, SAVE it often and on various sources. Also, write Tab T to the person who knows nothing about the mishap. Include enough detail to "walk" folks through the entire mishap. When proofreading, attempt to read Tab T like you're reading it for the first time. This document will take a lot of time and go through many revisions. Use a footer that shows the date and time last revised. After developing a semi-finished Tab T, make a hard copy and ask each SIB member to review it. A great idea is to list each member's position with different color ink on the top right-hand corner of the document. Ask each to modify it with their specified ink color. By doing so, you'll know who's giving you the input. This process helps keep the editing process organized.

Bottom line is: You, the IO, must write Tab T. If someone's got major heartburn with a particular issue, attempt to work it out. However, you and the BP must decide on the final product. If an agreement still cannot be reached, inform the team member they can write a minority report.

Last, take some time off occasionally. Hit the gym. Never lose your sense of humor. But most of all, remember this is important stuff. What the SIB accomplishes may save a valuable jet or, more importantly, lives. I guarantee, it will be a rewarding experience.

(At the time this was written, Maj Tony Monetti was a B-2 Instructor Pilot and Chief of Flight Safety at Whiteman AFB MO.)



Late Spring, 1982, a low-level search and rescue mission out of Elmendorf AFB, Anchorage, Alaska. Seven sets of eyes on our C-130 are scanning the terrain 500 feet below us. We've been scanning for hours and the search has been on for days. I am a young, still-impressionable second lieutenant; a sponge, watching, listening, and learning. The lesson I was about to learn was not a pleasant one...

Something caught my eye, out to the right and high. The eye-doctor-types tell us our peripheral vision notes movement. The movement I noted was a light aircraft, less than 20 feet above us, 90 degrees to our heading, passing right to left. I could see the mud on the tires, the white ball-cap the pilot was wearing, the oversized beard he was sporting.

That was close! But for 20 feet, *we* might have been the objects of the next search. Two sets of aircraft fatalities and several SGLI pay-outs.

My aircraft commander was the Squadron Flight Safety Officer. Upon our return, I offered to file a report of our near-miss, with the suggestion that on all low-level search missions, someone be assigned the duty of *clearing the airspace* while the rest of the crew searched the terrain. Particularly on those beautiful Alaska days when "Doctor Bob" was most likely to be out and about, hunting caribou, moose, sheep and bear.

My aircraft commander stated there was no need to file a report of any type. He being a major and I being a second lieutenant, I did not directly question his reasoning. Instead, I approached the "squadron heavy," the Chief of Stan/Eval, another major. The Chief of Stan/Eval stated that it was the Flight Safety Officer's call. The incident was never discussed at any squadron flight safety briefing. No report was ever filed and no other aircrews ever received the benefit of our near-death experience, and the resultant flight safety lesson: Whatever the mission, *someone* on the crew needs to be assigned the duty of clearing for traffic!

Equally important, a young and still-impressionable second lieutenant had just learned that field grade officers, to include Flight Safety Officers and Chiefs of Stan/Eval, don't always do the "right thing" on flight safety. *Not* the lesson we want to be teaching young second lieutenants.

Summer 2000, a low-level C-130 formation airdrop mission. Lead aircraft is ten miles out from the drop zone. The crew is focused on the run-in, altitude, airspeed, drift, alignment, checklists and wingman consideration.

Like my C-130 experience from 18 years earlier, my friends in the lead aircraft never saw the traffic they were overtaking at their 12 o'clock and level. Their eyes were on the drop zone, their instruments, their charts and their checklists. Six of my friends, plus the light aircraft. Husbands and fathers. Friends. Good Guys.

As we sat in the squadron briefing room a few days later, I was torn by anger at the memory of my own experience 18 years earlier. If we had filed a report years ago, on that fine Alaskan afternoon, perhaps someone on the lead aircraft would have been assigned the duty of scanning for traffic. Perhaps this might never have happened. I thought of the wives and the children. I thought of my own wife and my own two sons.

Here I sat, eighteen years later, with a hundred-plus squadron members. Dejà Vu All Over Again.

With a major twist: The crew was *alive* to tell their story to all who could/would listen. A *report was filed* by the Chief of Stan/Eval, a major, the aircraft commander. In attendance at the briefing were the Wing Commander, the Vice Wing Commander, the Ops Group Commander, the Squadron Commander, the Wing Flight Safety Officer and the Squadron Flight Safety Officer. The *"leadership"* was talking. Nothing under wraps, nothing hidden from view. Flight safety lessons were being learned in this squadron and, equally important, in every other squadron in which our report was being discussed. Lives were being saved in briefing rooms throughout the Air Force.

Leadership was speaking. More importantly, *future leadership was listening*. As I looked about the briefing room, I counted eight lieutenants in flight suits, along with ten airmen. An example was being set; a leadership lesson, as well as a flight safety lesson, was being learned. Indeed, it could be argued that the two lessons were one and the same: Leadership demands flight safety and flight safety demands leadership.

Write the report and save a life. Exercise leadership and save a life. Set an example and save a life. The life you save could have been mine, 18 years ago. The life you save could have been my/your friend's this past summer. Fly Safe.

("J.S.T. Ragman" is the pen name of a C-130 pilot and unit commander in the Air Force Reserve. He is also a Boeing 777 pilot for a major airline.)

The education of all air traffic system users is the key.

HAZARDOUS AIR TRAFFIC REPORT (HATR) SUMMARY FOR CY01

MSGT JAMES K. ELLIOTT
HQ AFSC/SEFF

This article breaks down the CY01 reportable incidents, trends, HATRs by location and MAJCOM, and the HATR Safety Automated System (HATR SAS).

CY01 Reportable Incidents

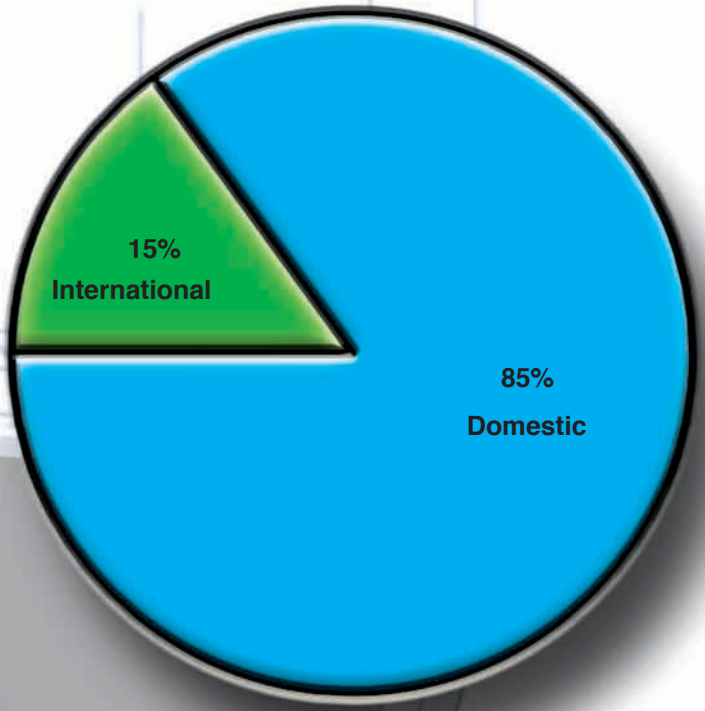
There were 143 HATRs filed from 01 Jan 01 through 31 Dec 01. Near Midair Collisions (NMAC) represented approximately 59% of the reportable incidents, which is up slightly from FY00. The majority of NMACs were between USAF aircraft and civilian general aviation aircraft not using correct "see and avoid" procedures. Base safety offices must keep the civilian flying organization knowledgeable of their local hazards and their flying missions through their Mid-Air Collision Avoidance (MACA) program. The education of all air traffic system users is the key for decreasing the number of hazardous situations faced by flying communities. The second largest category was ground incidents. The majority of these incidents were between USAF vehicles and USAF military aircraft. There was a mixture of causes, mostly vehicle operators not adhering to and understanding ATC instructions around the runway environment. Unit flightline driving managers must continue to be aggressive with their training programs, especially with contractors not familiar with the base runway environment. There were no significant increases/decreases in the other categories to quantify any trends.

HATR SAS

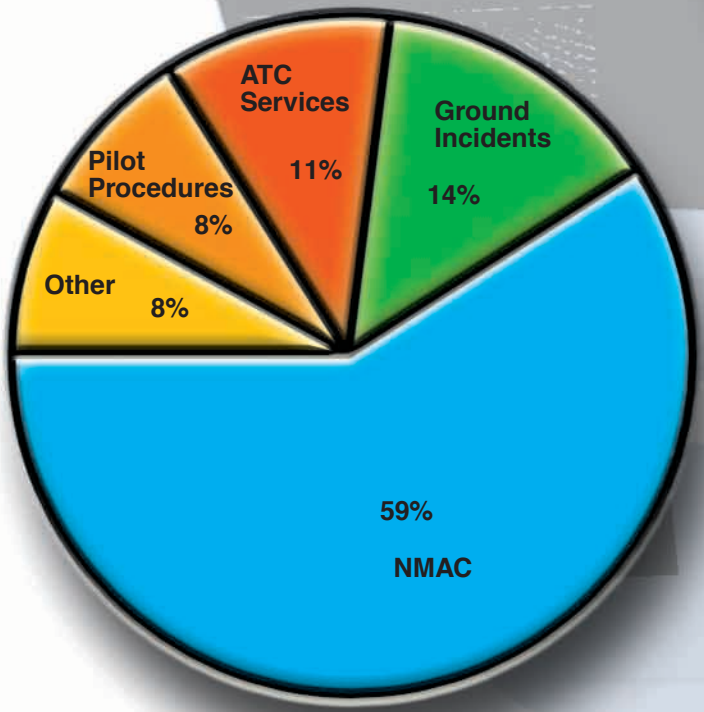
The new HATR SAS web-based database was created in early 2001 and production of the system has been in use since May 01. We created the system to help make it easier for the unit flight safety offices to file and retrieve HATRs from the database. There has been an overwhelmingly positive response from the field since its inception.

Conclusion

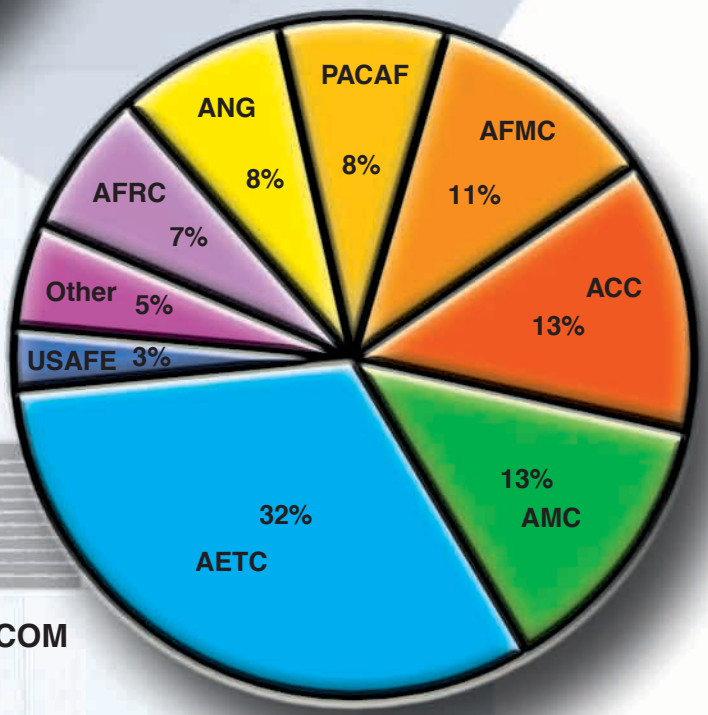
To ensure success in mishap preventon, we need all units to continue their HATR submissions. Send your comments to HQ AFSC/SEFF 9700 "G" Avenue, SE, NM 97117-5670; call DSN 263-2034; or e-mail Kevin.Elliott@kafb.saia.af.mil.



CY01 HATRs by Location



CY01 Reportable Incidents



CY01 HATRs by MAJCOM

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

WHO GOES THERE?

This is usually a question asked by a sentry protecting our resources, but unfortunately some aviators had to worry about "Who Goes There?" as they were taxiing or landing. Keep your eyes open for that unplanned runway user.

Runway Visitor Number 1

The MC-130P crew was cleared to land by a CCT (combat control team) on a local auxiliary field. As the Combat Shadow crew approached on NVGs they saw vehicle headlights on the runway departure end and initiated a go-around. As they overflew the departure end of the runway, they saw a forklift exiting the runway. How could this happen with a CCT and only properly-trained people operating near the runway?

In this case, the ever-friendly aerial delivery folks were completing operations for the night, and the supervisor sent the forklift driver ahead of the team. The operator followed the access road, and his unfamiliarity with the road led him to turn early and encroach the runway, *losing situational awareness*. The driver quickly realized he was in the wrong place and performed a 180 to exit the departure end of the runway. The Combat Controllers saw the forklift but *believed* it to be clear of the runway. The aircrew judged the vehicle to be *on* the runway.

The aircrew did the smart thing and went around for another chance, and the CCT ensured the forklift was off the runway. Remember, if you aren't sure the runway is clear, don't guess, especially when you have people on the ground who can make sure it is clear!

Visitor Number 2, Come On In

At one of our northern bases a B-1B was on short approach when a snowplow entered the runway from one of the taxiways. The tower noticed the vehicle and tried, with no success, to contact the vehicle. With no contact with the vehicle, they initiated a go-around for the aircraft. Unfortunately, the aircraft was too close to the end of runway and instead of a missed approach had to fly a short touch-and-go. About this time, the vehicle operator

realized his place in the world and immediately exited the runway.

The big question is how could a trained snowplow operator get onto the runway without clearance? The driver was clearing the taxiway and, not wanting to drop any snow on the taxiway, lost sight of his whereabouts and crossed the hold line onto the runway. Luckily, he realized the mistake and exited stage left. The tower was right on the job by noticing the incursion and trying to clear the runway and initiating the go-around. The aircrew did a great job responding with very little notice and ensured they would not become a statistic, other than a HATR. You never know when someone will enter your path.

Visitor Number 3, You're On Stage

An FAA Flight Check aircraft was performing a recorded instrument landing of the runway when tower controllers observed a blue truck on the runway near a taxiway. The tower had not been called and had not cleared any vehicle onto the runway. The tower then broadcast a blanket radio call requesting identity of the vehicle, which then identified itself as a civil engineer (CE) supervisor's vehicle. The vehicle was instructed to immediately leave the runway, and unfortunately the incoming aircraft was diverted to a low approach that cancelled the instrument landing check.

What happened here? For your information, the vehicle was escorting a work team performing airfield mowing operations. The vehicle had tried to contact the tower once, one hour prior to the incident, but a barrier maintenance crew stepped on their radio call. The tower heard the barrier maintenance crew, not the mowing crew, and had granted permission to the barrier crew. Do you see the failure to communicate here? Luckily, the tower was observant and saw the incursion in time to prevent an incident, and base CE learned some valuable lessons about runway procedures and where and when they can cut the grass.

Visitor Number 4, Speed Buggy

A T-38A was cleared to taxi to the runway and hold short. The tower then observed the aircraft traveling at a higher than normal rate of speed (maybe they were running late), and advised the aircraft to stop. Unfortunately, when the aircraft stopped, the tower observed the aircraft rear tires to be on the runway hold line. Not a good thing for the C-21A that was less than one mile on final approach, so they were sent for an uneventful go-around.

The rest of the story…the approximately 75-foot skid marks left by the T-38A on the wet taxiway showed the main gear tires to be at the hold line. Leaving the front of the aircraft approximately 29 feet into the runway. The moral of the story: How fast are you taxiing for the conditions you are encountering? Don't forget, "Speed Kills" in many ways!

Our Final Visitor

An F-16 aircraft had just landed with a hot gun emergency and was cleared to the hot-cargo pad where the emergency vehicles were waiting. As the F-16 was passing the 5000 feet remaining marker, tower noticed a vehicle crossing the runway at the departure end. Tower advised the emergency aircraft to exit at the high-speed taxiway due to the unauthorized vehicle, which it did uneventfully. As this part of the episode concluded, the IFE was terminated and the same vehicle was observed crossing back across the runway. Once again without clearance, and to the frustration of a C-12 crew that was on short final and had to be sent around.

Emergencies are part of the flying world, but we should not create one in responding to one. The driver held short of the runway hold line and had requested crossing clearance. In all the radio traffic, the vehicle heard the word clear, then replied the event vehicle was cleared to cross and report when off. He also replied to tower when he cleared the runway. Unfortunately, he didn't bother to ask permission the second time. If the event vehicle had asked permission to cross, how could this happen? Another case of failure to communicate between vehicles using the runway and the control tower. Operators beware, as not everyone listens when you are in critical phases of flight, and many people use the same frequency as you do. Make sure the radio call you hear is meant for you!



HQ AFSC Photo by
TSgt Michael Featherston

Editor's Note: The following accounts are from actual mishaps. They have been screened to prevent the release of privileged information.

HOW MUCH DID IT COST TO FINISH THE JOB?

This issue is about those unfortunate maintainers who didn't quite finish the job, or the job was finished but not quite the way it was supposed to be. Just think of the lost mission-capable time to repair the aircraft, the additional parts from an already short supply system and having to do the job twice–and let's not forget our wasted tax dollars. Lessons learned never come cheap!

Strike Eagle Bitten

An F-15E aircraft undergoing a phase inspection needed the delaminated speed brake repaired. The sheet metal tech checked in with the phase dock supervisor and was cleared to start. The speed brake is usually removed to fix delamination, but this time it was not. Main reason, the aircraft was a day late out of inspection and this would save repair time. The speed brake was then propped up with a 16-inch wooden wheel chock. Now in come the other interested parties in this mishap. Two phase workers were attempting to service the JFS (jet fuel starter) accumulator, and according to T.O. 1F-15C-2-80JG-10-1 external power must be on and hydraulic power applied to *all* systems. Do you see where this story is going?

The two phase workers applied electrical and hydraulic power, and you guessed it, the speed brake closed on the 16-inch wooden chock. Guess which part won this battle? If you guessed the chock you guessed right, as it extensively damaged the speed brake. Luckily, no one was injured except the poor speed brake and some maintainers' egos. Unfortunately, the speed brake had to be repaired at a cost of $11,649 of your tax dollars. Remember, clear the work area first, then apply power, plus do not forget that the shortcut you used last time may not be so short this time.

C-5A Needs Another New Tire

Prior to this incident the unfortunate C-5A received a fresh set of rubber on five of the main gear wheels. This being a rather large task (remember the size and number of C-5A wheel assemblies), it was not finished in one shift, and the swing shift turned over the tire changes to the oncoming night shift, who finished the five tire changes. The 7-level supervising the tire change was also training a new 3-level on the procedure and was being very deliberate to explain each step and specific reasons behind the T.O. procedures. Good job to the supervisor for utilizing a training opportunity. There were no

distractions and no interruptions to the task at hand and the forms documentation was done just as the book states.

Six days later, the aircraft got to roll out for a local air-refueling sortie. During takeoff roll the aircraft gave the operators a *flickering* Det Fail light (anti-skid detector fail) at rotation speed. The aircrew, smartly may I add, took off and continued the sortie. Upon landing roll the crew received another *flickering* Det Fail light along with delayed braking action until below 65 knots. The aircrew pulled off the active runway and deplaned the scanner to check things out. Everything looked fine on the landing gear, so the aircrew taxied back to parking and turned the aircraft over to the maintainers. Now the rest of the story came out, and any guesses on what happened?

During the post-flight inspection they found a broken tire deflation valve on a wheel assembly, damage to the wheel well assembly and a *missing* inner wheel bearing. How could a training session on tire changes go wrong? Needless to say, this goes back to what has been said thousands of times before: "Always check your work, and make sure it's by the book." Cost of this little incident: only a minor $23,647 of your tax dollars.

F-16C Does The Splits

During a scheduled 300-hour phase inspection the mishap aircraft required the removal of the engine and the inspection of the main landing gear door bushings. After engine removal, a crew jacked the aircraft to facilitate the removal of the main gear door bushings for inspection. After the gear doors were removed, the aircraft was lowered off jacks onto metal skid plates to allow the landing gear to seat and prevent stress to the airframe. The miscue started here, as T.O. 1F-16C-2-07JG-00-1 para 2-1-1 Step 16 requires the aircraft to be repositioned off skid plates after it is lowered. Current policy, in this phase dock, was to leave the aircraft on the skid plates until the gear door bushings were reinstalled. This *saved* the phase dock crew from having to remove the plates and reinstall them two days later, a time saver. In the meantime, the engine bay was inspected along with the rest of the aircraft. The machine shop was still inspecting the landing gear door bushing when the engine was ready to be reinstalled in the aircraft. Now think here: The engine is going back in, the gear doors are still removed and the skid plates are still installed. Do you see a trend?

The mishap crew now started to install the engine back in the mishap aircraft and proceeded without incident until…the mishap crew began to lower the jackscrews on the aft cradle of the engine removal and installation trailer. This action transferred the weight of the engine back to the airframe, which, remember, was still sitting on skid plates. The crew lowered the jackscrews and removed the safety pins, leaving the jackscrews extended one-inch above the trailer base plate. Can you guess what happened next? The aircraft shifted on the skid plates and the extended jackscrews came in contact with the engine monitoring system processor and cooling lines, along with damage to the engine trailer. What went wrong? You decide. What step or steps would have prevented this incident, and could supervision have helped prevent the damage and subsequent extra work? Did the phase dock save time or waste time? Cost to you, the taxpayer: only a meager $27,400.

E-4B Hurts Itself

Another high-priced Air Force asset, this time an E-4B, was undergoing a scheduled phase inspection. The day prior to the mishap, the jet techs were dispatched to perform an inspection of the #1 engine. In order to open the engine cowling, a helpful crew chief retracted the #2 leading edge flap (LEF) to provide clearance for the cowling. Once done, the jet troops opened the cowling and proceeded with their inspection. The next day, two electro/environmental technicians were dispatched to perform a duct leakage bleed-down test on the aircraft. These checks require the technicians to check the bleed air ducts extending through the engine struts. This task also requires the LEFs to be extended and safety locked prior to pressurizing the system, and a warning in T.O. 1E-4B-2-36-11-00 states "install locks to prevent injury from inadvertent operation of flaps." The aircraft forms indicated that all safety locks were installed.

Remember what happened the day prior to this incident? I bet you guessed what happened during the bleed air duct check. If you guessed the #2 LEF segment extended and contacted the now open #1 engine cowling, you are correct! Unfortunately you don't win a million dollars. "What went wrong?" you might ask. How about deviation from the routine, the proper or improper documentation of safety equipment installed or not installed, and once again, how about doing a walk-around to check everything before you start the task? Remember, moving parts can hurt you and the aircraft you work on. This little episode cost taxpayers another $40,149 of our hard-earned money. Good thing it's tax time!

FY02 Flight Mishaps (Oct 01-Feb 02)	FY01 Flight Mishaps (Oct 00-Feb 01)
14 Class A Mishaps	6 Class A Mishaps
5 Fatalities	2 Fatalities
9 Aircraft Destroyed	7 Aircraft Destroyed

14 Oct	♣	An HH-60 crashed into a river while flying a low-level training mission.
17 Oct		An F-16CG was severely damaged following an aborted takeoff.
25 Oct		An F-16C departed the runway after landing.
02 Nov	♣	An MH-53 crashed while performing a mission.
05 Nov	✶	An F101 engine undergoing Test Cell maintenance sustained severe fire damage.
12 Dec	♣	A B-1B crashed into the ocean shortly after takeoff.
21 Dec	♣✶	A C-141B sustained a collapsed wing during ground refueling operations.
30 Dec	♣✶	An RQ-4A Global Hawk unmanned aerial vehicle crashed while returning to base.
08 Jan		A C-17 was damaged during landing.
10 Jan	♣	An F-16C crashed during a surface attack training mission.
10 Jan		An MH-53J crashed during a search and rescue mission.
17 Jan	♣♣	Two A-10As were involved in a mid-air collision. Only one pilot ejected safely.
24 Jan		An MH-53 crashed while performing a mission.
25 Jan	♣✶	An RQ-1 Predator crashed on landing.
31 Jan	♣	A T-37 crashed during a training mission. The two crewmembers suffered fatal injuries.
02 Feb	♣	A C-21 crashed while landing. The two crewmembers suffered fatal injuries.
12 Feb		An F-15 was severely damaged due to an engine fire.
12 Feb	♣	An MC-130P crashed during a mission.

- A Class A mishap is defined as one where there is loss of life, injury resulting in permanent total disability, destruction of an AF aircraft, and/or property damage/loss exceeding $1 million.
- These Class A mishap descriptions have been sanitized to protect privilege.
- Unless otherwise stated, all crewmembers successfully ejected/egressed from their aircraft.
- Reflects only USAF military fatalities.
- "♣" Denotes a destroyed aircraft.
- "✶" Denotes a Class A mishap that is of the "non-rate producer" variety. Per AFI 91-204 criteria, only those mishaps categorized as "Flight Mishaps" are used in determining overall Flight Mishap Rates. Non-rate producers include the Class A "Flight-Related," "Flight-Unmanned Vehicle," and "Ground" mishaps that are shown here for information purposes.
- Flight and ground safety statistics are updated frequently and may be viewed at the following web address: http://safety.kirtland.af.mil/AFSC/RDBMS/Flight/stats/statspage.html
- **Current as of 25 Feb 02.**

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The Aviation Well Done Award is presented for outstanding airmanship and professional performance during a hazardous situation and for a significant contribution to the United States Air Force Mishap Prevention Program.

Captain James J. Curtis
44th Fighter Squadron
Kadena AB, Japan

On 1 August 2000, immediately following a Basic Fighter Maneuvers (BFM) engagement, Capt Curtis experienced a sudden and uncommanded roll and yaw to the left in his F-15C. Capt Curtis immediately countered the roll with opposite aileron and recovered the aircraft to an upright attitude. Following the recovery, however, the aircraft maintained a very uncomfortable yaw position, requiring excessive control stick input just to maintain straight and level flight. Capt Curtis noted that both rudders were deflected to the left and exhausted all available trim resources in an attempt to correct the situation. He informed flight lead of the flight control problem involving uncommanded rudder deflection. He found it extremely difficult to maintain aircraft control, requiring almost full opposite rudder and nearly 60 percent stick deflection.

While returning to base, Capt Curtis and flight lead accomplished all appropriate checklist procedures for flight control malfunctions, but the problem persisted. Combating fatiguing flight control inputs to keep the aircraft from rolling inverted, Capt Curtis configured his F-15C for a controllability check. Throughout the check, the heavy control forces remained and the aircraft was difficult to fly, but Capt Curtis determined his aircraft was safe to land. Meanwhile, weather conditions were deteriorating at the home base of Kadena and his main radio became inoperative, significantly complicating the recovery.

The nature of the flight control malfunction made right turns almost impossible, so Capt Curtis had to maneuver his aircraft using only left turns. Additionally, ATC instructions had to be relayed by flight lead due to his main radio problems. Heavy crosswinds, turbulence and a wet runway at Kadena further complicated an already challenging situation. Despite deteriorating circumstances, Capt Curtis executed a flawless instrument approach, broke out of the weather and successfully engaged the approach end cable.

Capt Curtis demonstrated superior airmanship and skill in handling an unusual and complicated emergency situation. His knowledge of aircraft systems and flawless execution prevented the loss of a multi-million dollar Air Force combat asset.

How many more in 2002?

USAF Photo
Photo Illustration by Dan Harman