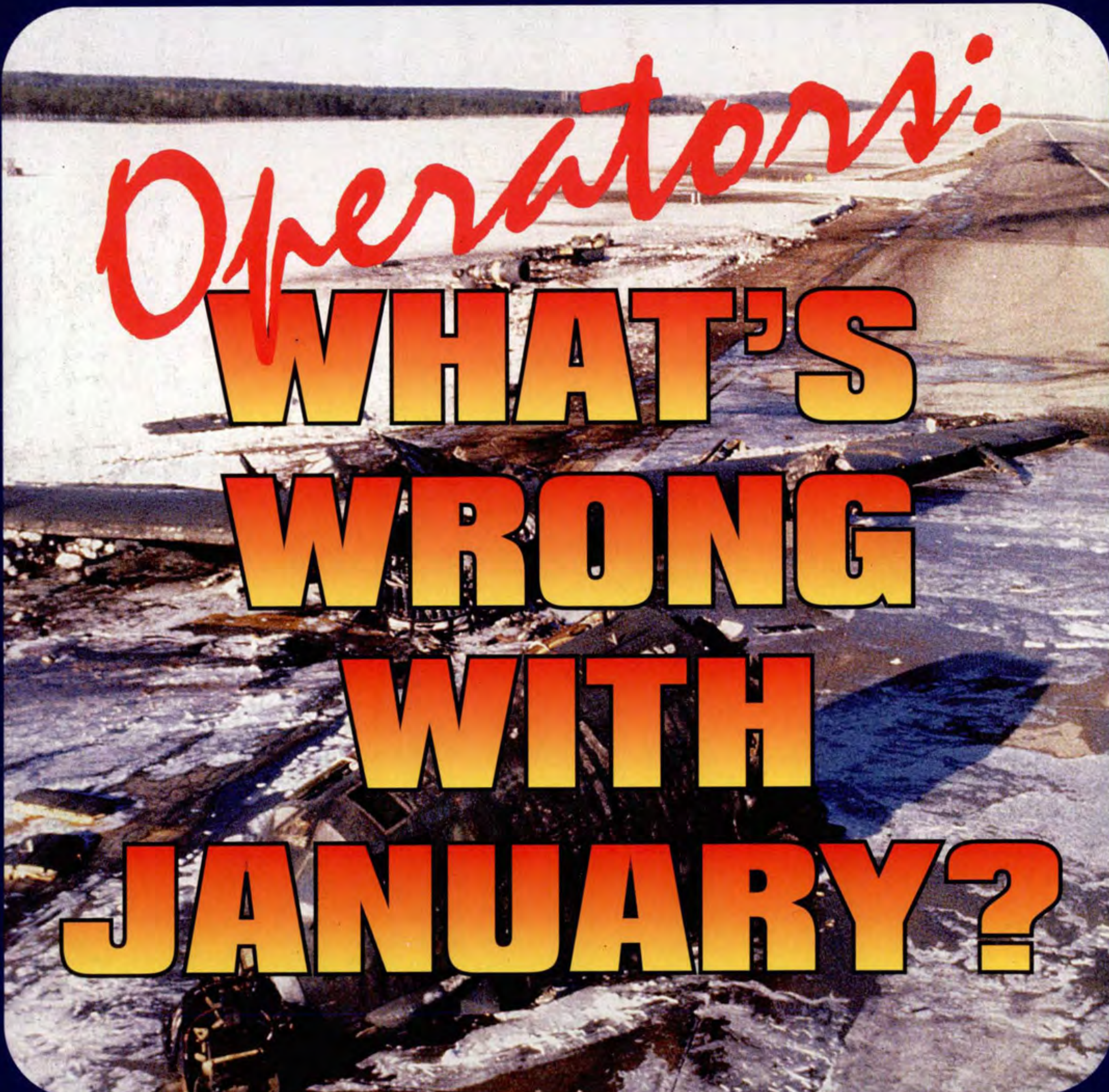
flying SAFETY

DECEMBER 1998



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PURPOSE — *Flying Safety* is published monthly to promote aircraft mishap prevention. Facts, testimony, and conclusions of aircraft mishaps printed herein may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. The contents of this magazine are not directive and should not be construed as instructions, technical orders, or directives unless so stated. **SUBSCRIPTIONS** — For sale by the Superintendent of Documents, PO Box 371954, Pittsburgh PA 15250-7954; $25 CONUS, $31.25 foreign per year. **REPRINTS** — Air Force organizations may reprint articles from *Flying Safety* without further authorization. Non-Air Force organizations must advise the Editor of the intended use of the material prior to reprinting. Such action will ensure complete accuracy of material amended in light of most recent developments.

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Tell Us Your Story

We are looking for first person articles for *Flying Safety* magazine. Have you ever bailed out of an aircraft? Experienced a potentially serious emergency? Had a near miss with another aircraft? Discovered a potential hazard? If so, tell us about it.

Our mission is to help prevent mishaps through education. Nothing beats hangar flying. Sharing your experiences means that other fliers, maintainers, air traffic controllers, life support people, etc., can learn from what happened—or almost happened—to you. Your feelings, thought processes, and actions, along with the results of those actions, can be invaluable in helping someone else be prepared for the same (or a similar) experience.

Send us your story by E-Mail (preferred), fax, or "snail mail"—typed or neatly printed. Don't worry if you don't think you can produce award-winning writing. Give it your best shot, and we will be happy to put the finishing touches on it.

The story may be any length, but we prefer to limit articles to no more than about 2,500 words. Keep the writing simple and direct. Be specific, use as few words as possible, and make those words simple, short, and familiar. Don't "utilize" something when you can "use" it. In short, we're not trying to impress someone—we just want to get the safety message across as effectively as possible.

If you have photos to support your story, we would appreciate receiving them also. They may be color, black and white, or slides. If you want them returned, let us know and we will be sure to send them back.

If you don't want your name used in the magazine, tell us and we will print your story anonymously. The message will still get to those who can profit from it, and you will have the satisfaction of knowing you did your part in reducing or *preventing* mishaps. If it's okay to use your name, please include a brief biography.

So, do your part for safety! Send your story in *now*, while you're thinking about it. Include your name and DSN number so we can contact you to let you know when it will be published and also answer any questions you, or we, may have.

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There I Was...

Anonymous
Flying Safety, Dec 92

I lied last year when I said, "The rest of the ride was pretty quiet." You remember. Everyone else on the B-52 had gone to sleep. There I was, a young copilot extraordinaire, Maple Flag bound, way, way up north in Canada.

Now, it was true I did drop down to plus or minus 100 feet, mostly minus, and skim the marshy tundra. And it was also true we all eventually woke up and went on with our mission. However, I can't say things remained quiet.

An undercast formed. We were in the clear and on top at about 2,000 AGL. We began to see less and less of the ground, until finally, we were above a featureless, vast blanket of white...in a huge, dark green air machine.

Don't get me wrong—I love white puffies and ecological stuff just as much as anyone else. The problem for me was this nice undercast was in the wrong place. Why couldn't it be just 200 feet higher? I wanted to be in the clouds, or under them, or many miles above them, but not just barely above them.

The unfairness of it all! The BUFF can't run! Its huge, square sides make it hard to hide, and it can't pull Gs. Besides, we have to fly into this postage-stamp-sized intercept area to practice getting shot down. To top it all off, we've highlighted ourselves over this white sheet of clouds.

And then, for the second (but last) time that day, I executed a brainstorm. Why not just drop down a measly few hundred feet and duck into the clouds?

I asked the nav team how much terrain clearance we would still have if we dropped down 300 feet.

(I didn't want the 40-foot fin sticking up out of the cloud—no "Jaws" music for me.) Were there any high towers along the route? Knolls, hills, ridges? Did the terrain slope up into us? Could I go down 300 feet and stay there through the target area?

Their answers were all what I and the pilot wanted to hear...so we did it. In fact, at the time, the other five folks on the jet thought I had a wonderful idea. (They were no happier at the prospect of this next "fighter exercise" turning out the way every previous one had ended for us: 16 successful intercepts—no misses.)

Yup, we did it. Ducked into the weather below a hard IFR altitude, on a training mission in peacetime. Yes, I know. Dumb, dumb, dumb. Short-sighted. Risky. Ineffective.

The radar never painted a shadow, so we were never below any ridges or other high terrain. If there were towers, we missed them.

But, the exercise monitors didn't miss us. Neither did the ATC radar. We were "clever" enough to turn our IFF/SIF to "standby," but that only had the effect of making ATC and the monitors twice as mad.

No one was waiting for us when we taxied in to parking at home plate. However, current ops did have a message and phone number for my aircraft commander to call. It was a pretty one-sided conversation on our end. Lots of "No excuse, sir"—that sort of thing.

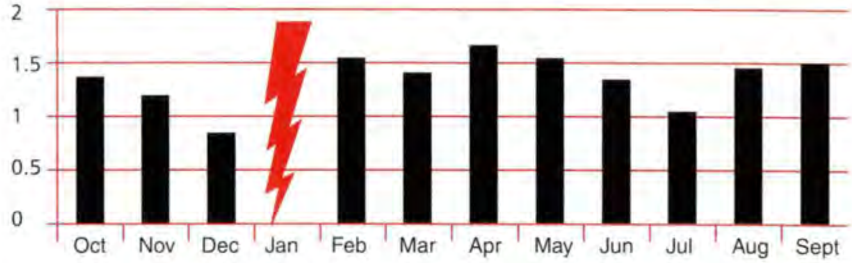
I did a lot of growing that day. We all did. When I saw people pushing too hard after that, I wasn't afraid to speak up: "Is this worth the risk?" You can, too. Please do. ✈

What's Wrong With January?

MAJ PAT KOSTRZEWA
Mishap Investigator
HQ AFSC/SEFF

After one of my fellow action officers identified a less-than-stellar performance in our recent January mishaps, the question was asked of me, "What's wrong with January?" With my statistics book in hand, I began to look at the 34 Class A mishaps we've had in the month of January in the 1990s.

Drawing conclusions from events that occur on the average of one or two sorties out of every 53,000 sorties, or, put differently, two-thousandths of one percent of the time, is a tricky business—the statistical equivalent of determining characteristics of a population of 53,000 people by examining one person. Nevertheless, if given 20 to 30 of these people, I can probably see what, if anything, they have in common. To the right is a chart of the Class A mishap rates in the 1990s broken down by month.



As you can see, there is something going on in January. First, January is the highest mishap rate month and the beginning of a string of high mishap rate months that don't end until July. It's also over twice as high as the month prior. What's wrong with January?

I divided and categorized the mishaps every conceivable way to decide if they had anything in common. I looked at them by dates of occurrence, type of aircraft, causal findings, human factors, and causal categories. I did rates, means, standard deviations, and confidence intervals. I compared January with the other 11 months of the year in all these areas. I didn't get much for my effort, but I did get something.

For some reason, we have more mishaps attributed to operations in January than at other times of the year. Two-thirds of those operations mishaps are attributed to individuals or supervisors. Further, the reasons cited for those causes are predominantly judgment, channelized attention, and task saturation. What's wrong with January?

I then polled others within AFSC for theories outside of the data.

Some said weather. The numbers show less than 2 percent of the causal findings for January Class As were attributed to weather.

Some said it's the layoff after the holidays. The numbers show only 6 percent of the January mishaps occur in the first week of January. After that, the other weeks all have an equal probability of a mishap. This would seem to indicate that the first sortie back is not the most dangerous, but the second, third, or fourth sortie of the month is the dangerous one.

Some said it was supervisors underestimating the amount of time it takes to spin back up after the holidays. This is possible, but data does not show it as a trend.

I then tried to tackle the problem from a different direction. Instead of asking why January is so bad, I asked why December is so good. Obviously, finding out why a mishap didn't happen is more difficult than finding out why it did happen. Again I polled AFSC.

Some said the reason is because we don't fly as much due to the holidays. But the graph depicts mishaps per hundred thousand hours, not total mishaps. Others have guessed we fly lower-risk missions on average during December. This may be a partial contributor, but it is impossible to quantify. Some said people actually are more conservative in how they operate during December because in the back of their minds they are thinking about spending time with loved ones, and this consciously or subconsciously biases their decisions. Good psychobabble—entirely possible—but hard to quantify.

Given all the data listed above, what do we do about January? Remember, the whole point of this exercise is to identify problems with our worst mishap month and work to decrease that mishap rate. In this case, if we can decrease the January rate, we may see a carryover into the following months which are also historically high mishap months.

In the end, I can no more tell you what's wrong with January than I can tell you what's right with December.

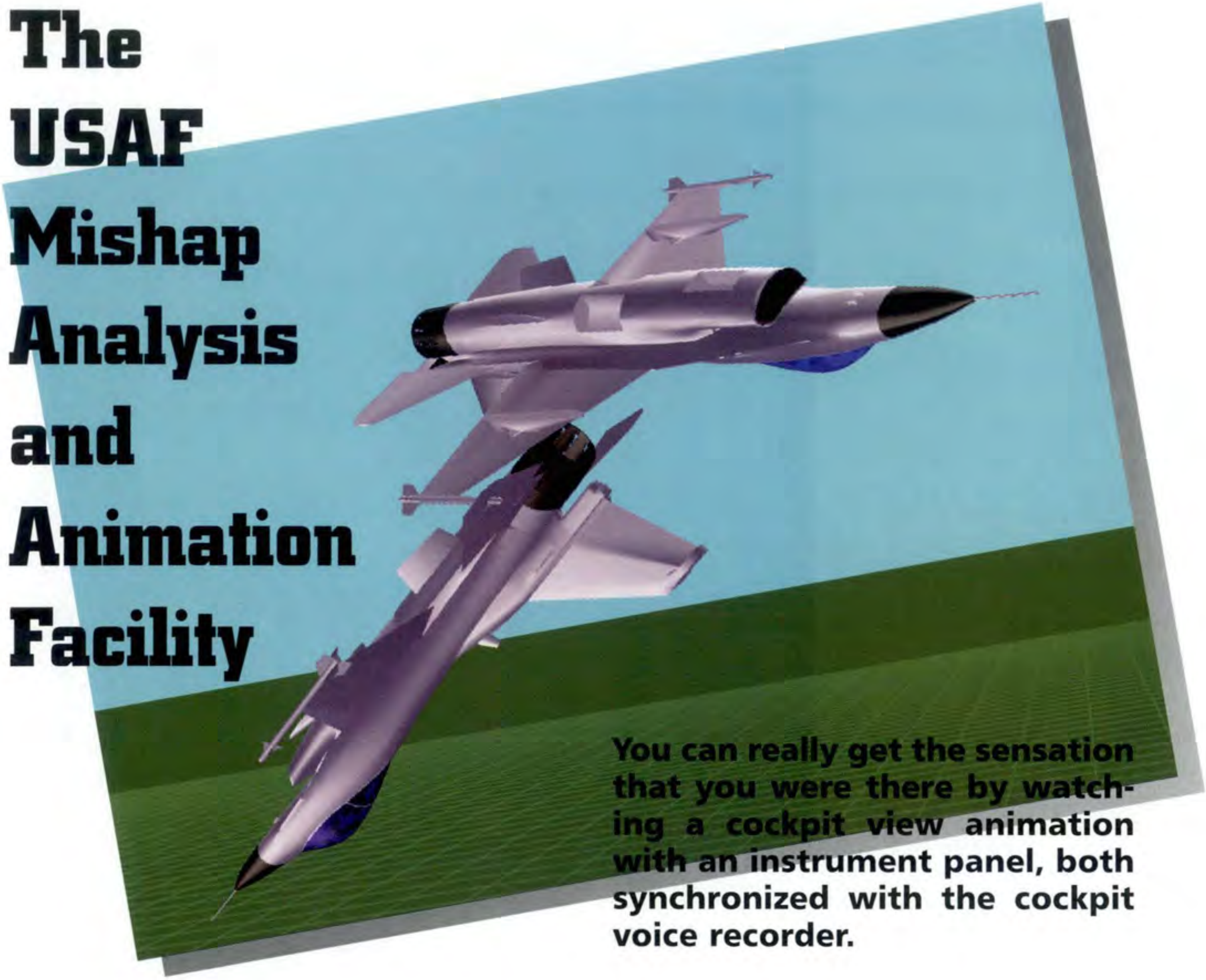
I can tell you the majority of our mishaps during the year are people mishaps, and in January that percentage goes even higher.

I can tell you that although you may fly fewer sorties in January, they are the highest risk sorties you will fly that year.

Finally, I can also tell you, after working four Class A mishaps in one year and seeing the results of four fatalities on the families, friends, and squadrons, there is no good month for a mishap.

Mishaps are a statistical certainty. Class A mishaps and fatalities are not. This January, let's work toward starting the year off right by padding what we do with a little extra caution and the realization that the greatest risk of a mishap is staring us in the mirror every morning. ✈

The USAF Mishap Analysis and Animation Facility



Up to 10 separate aircraft flight paths can be added to the animation, allowing for re-creation of multiple aircraft mishaps (above). Combining this with the multiple window and unlimited viewing angle capabilities, we can see the event from many perspectives at once.

You can really get the sensation that you were there by watching a cockpit view animation with an instrument panel, both synchronized with the cockpit voice recorder.

MR. GREG SMITH
Chief, MAAF Facility
HQ AFSC/SEFE

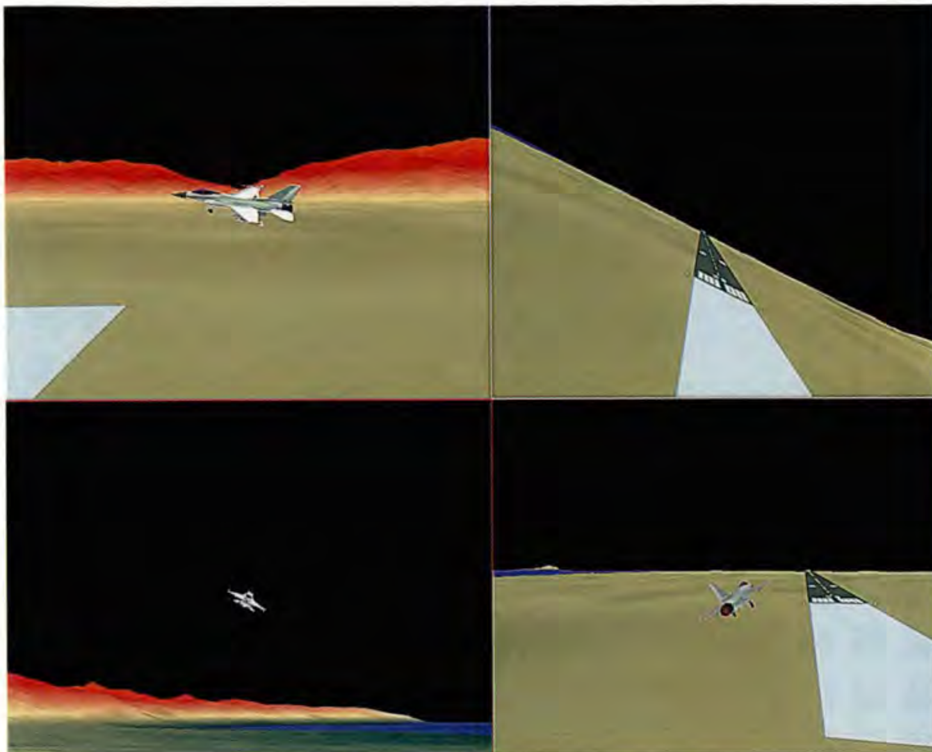
The USAF Mishap Analysis & Animation Facility (MAAF) is now operational at the HQ Air Force Safety Center (AFSC), Kirtland AFB, New Mexico, after being relocated from Tinker AFB, Oklahoma, this past summer. The MAAF's mission is to support Safety Investigation Boards (SIB) by downloading, analyzing, and animating data from the flight and cockpit voice recorders on Air Force aircraft. You can really get the sensation that you were there by watching a cockpit view animation with an instrument panel, both synchronized with the cockpit voice recorder. The visual lessons learned will stay with you for some time.

Animation is a powerful tool for analyzing and presenting the large amount of data from a mishap in a time-correlated manner. It shows you the actual timing of events—many happening all at once—just as it occurs in the real flight. It also gives you the ability to replay events in slow motion or in reverse to study the details.

MAAF History and Capabilities

The MAAF was formed as an extension of the Oklahoma City Air Logistics Center, Technology and Industrial Support Division's (OC-ALC/TILO) Aircraft Structural Integrity Management Information System, which has processed flight data for over 25 years. The MAAF went operational at Tinker in September 1994, and became an operating location of the HQ AFSC, Aviation Safety Division's Engineering and Technical Services Branch (HQ AFSC/SEFE) in January 1997.

MAAF development began in 1993 with a dual thrust from the B-1B System Program Manager (SPM)



Once recorder data and terrain information are loaded in the computer, animations of any portion of the flight can be viewed in real time, fast or slow motion, forward or reverse. Shown here (clockwise) are four freeze-frame views of the same point in the flight: chase view from abreast, cockpit view; ground observer view from the runway; and a right trailing chase view. (left)

A variety of information taken from the data recorder, or other sources, can be displayed on screen as text, on simulated instruments, or as any desired type of indicator. New improvements to the software allow the use of 3-D and photo-realistic lights and instruments. (below)

and the F-16C/D System Program Office (SPO). The F-16C/D SPO awarded a contract to Smiths Industries to deliver a system which would give the Air Force an organic capability to download, process, analyze, and animate the data from damaged and undamaged Smiths Industries Standard Flight Data Recorders (SFDR) on the F-16 A/B Air Defense Fighter variant, F-16C/D, F-15E, and C-17 aircraft. This gave the MAAF the capability to download data from individual chips of recorders that were heavily damaged in a mishap. The animation capability also included the ability to import Defense Mapping Agency (DMA) terrain elevation and features data. These capabilities were delivered in July 1994.

During the same time frame, the B-1B SPM directed funds to TILO to develop a system to analyze and animate data for the B-1B and all other "non" SFDR-equipped aircraft. In February 1994, Recovery Analysis & Presentation System (RAPS) software was installed on a Hewlett Packard computer workstation at the MAAF. Developed and maintained by the Transportation Safety Board of Canada, RAPS is currently being used by all U.S. armed forces safety centers, the U.S. National Transportation Safety Board (NTSB), and equivalent agencies worldwide.

RAPS also has the capability to recover data from tape-type flight data recorders when used with additional hardware and tape decks. In 1996, the MAAF acquired the additional hardware and tape decks needed to process the data from these recorders, which are on C-130, C-141, C-5, and E-3 aircraft. At the same time, hardware and software for downloading and analyzing cockpit voice recorders was procured, greatly enhancing the Air Force's capability to organically support its mishap investigations.

The MAAF has done more than 90 projects in support of mishaps, incidents, flight tests, and training videos in the last 4 years.

Animation

Animation is the re-creation of the

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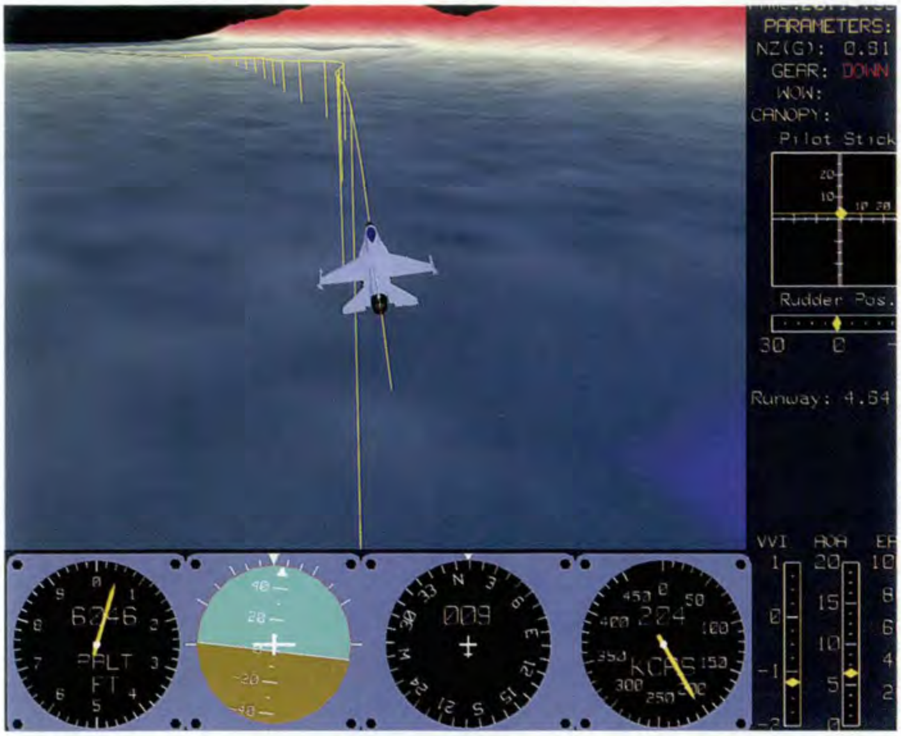
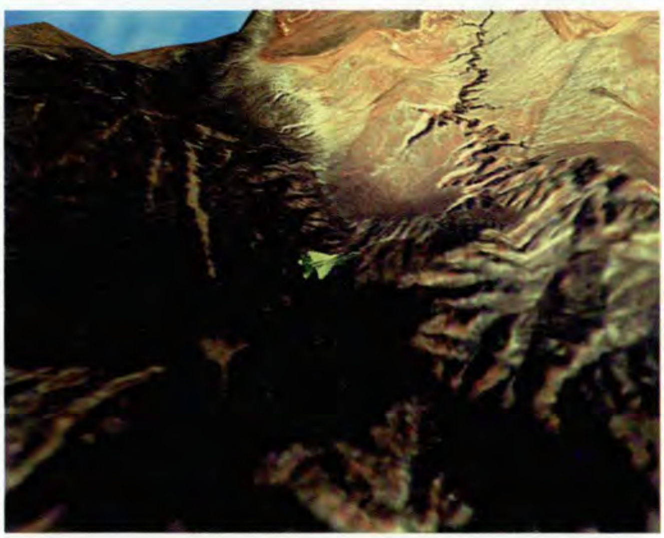




Terrain and airfields are critical to the re-creation of some mishaps. The MAAF can lay in terrain elevation data and shade it by altitude (top), or "texture map" an overhead photograph onto it for a more realistic appearance (middle). Runways can also be built and added to the animation (bottom).

flightpath and events as recorded during the mishap. The recorded airspeed, altitude, heading, pitch, and roll are used to define the aircraft's flightpath and attitude. Although Flight Data Recorder (FDR) data is the preferred source, it is not always available. In those cases, flightpaths can be built from radar data or the "best guess" information from the SIB, usually derived by reflying the mishap in a simulator and recording the simulator parameters.

Mishap animation can speed up the process of finding a mishap cause(s), improving safety and readiness. Fast resolution of mishaps can also reduce or eliminate costs for system tests that might otherwise be required in a search for mishap causes.

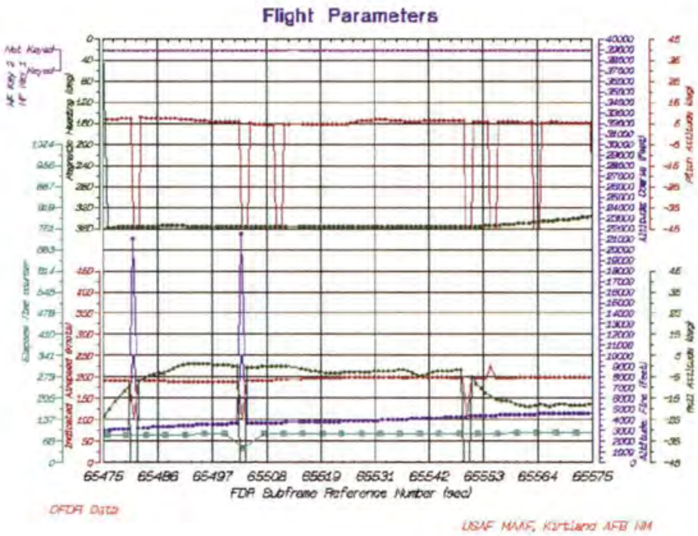
The animation software allows us to use knob box and mouse controls to change the viewing position such that the SIB can view the mishap from any angle, including chase, cockpit, and stationary ground views.

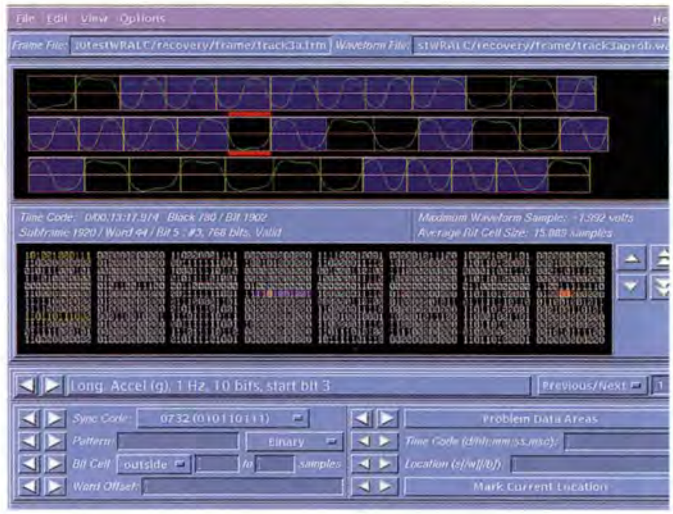
We can also add photo-realistic instruments and gauges to the instrument panel displays. The new "glass cockpit" has driven changes to the software to allow us to design any instrument or display the SIB feels is important to their analysis and presentation of the mishap sequence. Realistic HUDs can now be displayed in the cockpit view.

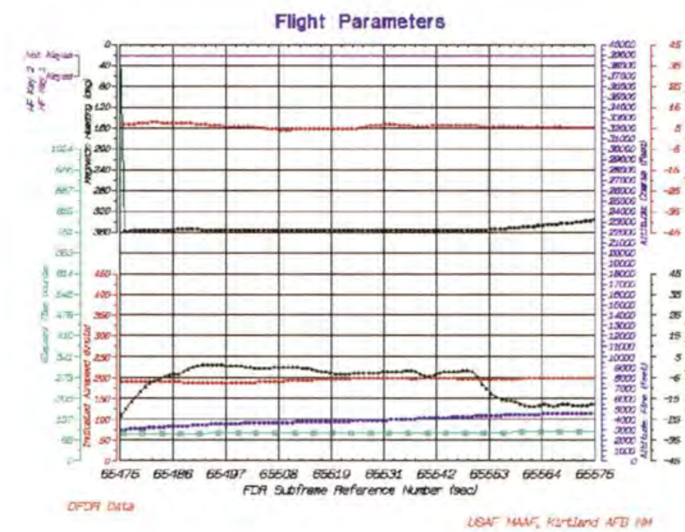
RAPS revisions since the original installation have also given us the abilities to use DMA terrain data and to put overhead photographs of the crash site on the terrain using texture mapping.

In addition to animation, RAPS also has excellent analysis and plotting tools to allow us to derive required parameters from recorded ones and display the information in fully customized color plots.

We also have the capability to recover data from a tape that would, in the past, have been lost due to mechanical disruptions in the recording process. One recent example involved a C-5 incident at Diego Garcia. The recorder was pulled for analysis and sent to the depot. Depot used standard downloading







Advanced analysis tools allow us to recover data that would otherwise be marked "invalid" and discarded, if standard tools were used to review it. The first plot shows the data before being corrected (top left). The data then is analyzed and corrected using the flight data editor (above). The bottom plot shows results of the corrections (lower left).

equipment to try to get the data, but the entire 45-second incident was missing. They sent the recorder to us at the MAAF, and we were able to recover all but 1 second of the missing data and help determine the true cause of the incident.

Interservice Cooperation

Since the beginning of the MAAF, interservice cooperation has played a key role. The MAAF, along with our counterparts in the Army and Navy, has worked to develop capabilities, which, although unique in some ways, follow a common baseline. We all gain from the capabilities and developments of each other and thus have backup and overflow facilities without having idle equipment and personnel. The U.S. Coast Guard has also helped the development of MAAF by providing downloading equipment for their fleet in exchange for MAAF support of their mishaps.

Into the Future

Several enhancements are in development that will allow the MAAF to improve service to SIBs. Now that the facility is located at AFSC Headquarters, AFSC board representatives, engineers, and the SIB can communicate more effectively. And it gives AFSC personnel the opportunity to become familiar with MAAF products and services.

We are also testing methods for creating digital audio and video files that can be transferred back to SIBs more quickly than the traditional audio and video cassettes now in use. As new recorders come into the Air Force inventory, we must also keep up with the support of these new systems. Development at the MAAF is a never-ending challenge of keeping up with the latest in computer animation, digital audio and video, and flight recorder technologies.

The MAAF is an Air Force technical resource that exists primarily to support the efforts of safety investigation boards. However, we are occasionally able to provide assistance to others under special circumstances. Please refer to AFI 91-204, *Safety Investigations and Reports*, paragraph 3.10, for technical assistance request procedures. ✈

Maintaining SA to Avoid Midairs

MAJ BILL KOUKOURIKOS
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Edwards AFB, California

Hold it! This is not some egghead article on the eyeball and how it works. Nor is it an existential conversation on aspects of situational awareness (SA). I wrote this for you and me, the everyday pilot/crewdog looking for some quick info, so sit back for a few minutes.

SA is talked about in all flying circles, from the Aero Club to the squadron bar and even on the decks of 747s. We all know what it is, we know when we have it, some of us know when we are losing it, and all of us know when we have none (remember UPT and RTU?). SA may be the single most important factor that separates the great fliers from the average ones. Those who can maintain high SA throughout a flight will always be ahead of the game, drop bombs without getting shot, and take the first missile shot before the other guy knew what hit him. This article deals with only one aspect of high SA: using it to avoid swapping paint with another jet or the proverbial "puddle-jumper."

When the weather is great, when there are no aircraft malfunctions, when the cockpit is quiet, when you are on course and the aircraft is trimmed straight and level, it's no problem maintaining high SA. Heck, you might as well be sipping lemonade on the front porch.

However, it's a challenge to maintain that same type of SA when the world around you is changing rapidly. In a NASA Aviation Safety Reporting System (ASRS) study, Chappell[1] describes that there are two time zones in maintaining SA—NOW and the FUTURE. When you talk of NOW, it involves monitoring your current situation and evaluating how it's going. When you talk about the FUTURE, you need to anticipate events and consider contingencies.

Underlying all this is "The Plan,"

what your mind develops when it includes the jet, the path of events, and the people involved NOW and in the FUTURE as a course of action. Again, on a day like the one described above, it usually is no problem coming up with "The Plan," but throw one aspect out the window, and your mind has to go into overdrive. What hinders your mind from formulating a proper "Plan" are common Traps in SA. These are the same Traps that contribute to a loss of SA and subsequent midairs.

What are these Traps? I knew you would ask. In the following discussion, I will not take into account TCAS or radar, only pure aviation skills. Why? First, technology *aids* in SA but cannot build "The Plan" for you. Second, many midairs involve jets that have that equipment but still managed to hit each other due to low SA in the cockpit.

Focus on the Right Information at the Right Time

You are setting up for some high aspect maneuvering as both jets turn away from each other to get spacing. It's a bit hazy, and you quickly become "padlocked" on the other jet. You remember that you were close to bingo fuel prior to turning away. Do you quickly check your fuel? What's more critical here?

If you lose sight during a fight, you will lose SA and may set up a midair scenario. If you wait until the other jet shows planform, or is closer, to quickly glance at the fuels, then you can make the decision to continue or call "knock-it-off" for fuel. Without getting into eyeball mechanics, when you are looking at something at a far distance and then re-focus on something close, like the fuel gauge, your eyeball cannot quickly go back to infinity—thus lost sight, lost SA.

Watch Out When You're Busy or Bored

You are flying a VFR leg at 5,000 feet AGL. Everything is going as planned—it's day VFR, no radio chatter, and the terrain is gorgeous. While you gawk at those mansions on the coastline, you notice a civilian airfield with... WHAM! Forgot to scan the horizon, huh?

On the other end of the spectrum, you can just as easily miss what's going on outside the jet when you are busy trying to solve an EP. The engine problem you're working may be important, but that Piper is about to make your day even worse. Human factors studies show that both boredom and high anxiety contribute to lost SA. A slight to moderate amount of stress is best for top performance, so never get too relaxed in the cockpit, and be aware of the pitfalls when things get really busy.

Without getting into eyeball mechanics, when you are looking at something at a far distance and then re-focus on something close, like the fuel gauge, your eyeball cannot quickly go back to infinity—thus lost sight, lost SA

Expectation Can Reduce Awareness

You're in a 2v2 fight with one bandit nicely defensive. You call him a "mort" and turn your attention to the other bandit, *expecting* the "mort" to egress the fight. Next thing you know, you get a face full of jet. The same can happen during air refueling when you *expect* your flightmates will go to a briefed position. As you come off the tanker, you start to move to your briefed position, but where exactly is your flightmate? You have limited SA if you don't know the position of other jets in the vicinity of yours and are setting up a midair. Remember, a belly check will save your life, and visually acquiring your flightmates before any major maneuvering pays big dividends in building SA and avoiding midairs.

Things That Take Longer Are Less Likely to Get Done Right

You are being vectored for an approach, and the weather is VFR. The controller warns you of three traffic conflicts. You spot two immediately but can't seem to find the third. You assume he's not a factor and continue with your approach. Maybe the canopy bow is hiding the traffic, or maybe the traffic is still at a distance where your eyes don't have the time to focus correctly (read the first trap). But, because it's taking longer to find the third target, you lose interest and go on with your business, losing SA and creating an uneasy feeling in your stomach. It's a common joke that pilots read only books with lots of pictures—that says something about our attention span. Disregarding traffic because it's taking too long is a classic setup for a midair. Remember, traffic will not move in your window if it's on a collision course with you, making it harder to see.

Reliable Systems Aren't Always Reliable

Remember the comment I made about technology only being an aid to SA, not creating SA for you. TCAS is a great gadget, but it only works if that "puddle-jumper" is squawking some type of IFF code. Just because there are no warnings doesn't mean there is nobody there. Big jet aviators depend on TCAS much more than fighter types due to limited visibility. However, TCAS will soon be available in the T-38C. This jet has great visibility and maneuverability, so it should be obvious that pilots will not (hopefully) depend on the TCAS as much as the big jet aviators.

continued on next page

Recognizing you are slowly losing SA is the first step in regaining SA.

The Mk 1 eyeball still works great. In the fighter world where air-to-air radars exist, you may never see a traffic conflict if he's hiding in the notch. Imagine a Cessna practicing stalls, into the wind, while you're zipping along at 450 KIAS+.

Distractions Come in Many Forms

A study of NASA ASRS reports details how 114 cases of distractions in the cockpit created a breakdown of SA.

Checklist	22
Malfunctions	19
Traffic Calls	16
Studying approach charts	14
Radar monitoring	12
New copilot	10
Fatigue	10
ATC communications	6
Looking for airport	3
Miscellaneous	2

These mostly pertain to commercial big jet operations, but every one of us can study the list and think of where in our mission the distractions will cause a loss of SA and loss of traffic/formation visual skills.

How do you reduce these Traps to SA?

First of all, build your experience. Several years ago, the Situational Awareness Integration Team (SAINT) at Armstrong Labs performed a study with 171 F-15 pilots to determine factors in building SA[2]. They found that experience is the single most important factor that led to high SA. Along with experience was currency. The lesson learned is to take in and learn as much as possible about your mission. Seek critiques from your squadron buds, accept the mistakes you made, learn the proper techniques, and apply them. Build your SA before you fly. This will free up some brain cells to do other tasks—like avoiding midairs.

Second, recognizing you are slowly losing SA is the first step in regaining SA. As your SA diminishes, so does your ability to clear for other jets. You become more and more involved within your jet and let "The Plan" be less of the FUTURE and more of NOW. It may be as simple as admitting you lost sight, giving everyone else in the formation the info *they* need to increase *their* SA and help them train *your* eyes on *them*, instantly rebuilding your SA. The radio is a wonderful thing. If you don't know where your wingman went, just call for a position check—instant SA.

Third, delegate responsibilities in a crew jet (CRM?) so that even though everyone may have a different task, all of you are involved in a common goal. One of these tasks should be collision avoidance. Use the information the entire crew is providing to build your SA and develop a proper "Plan." This, in itself, is a large subject to study and ponder.

Building and maintaining "The Plan" in a fluid NOW and FUTURE separates the great aviators from the average ones. Those who can stay on top will also reap the benefits of avoiding midair collisions! Recognizing the Traps that lead to a loss of SA and loss of clearing your flightpath will help you, your crew, and your unit maintain a safer flying record. Don't let a midair ruin your day. FLY SAFE! ✈

References:

1. Chappell, Sheryl L., *Managing Situational Awareness on the Flight Deck,* NASA Aviation Safety Reporting System.

2. Carretta, Dr. Thomas R., and Zelenski, Maj Warren E., "Situational Awareness, There Is No Substitute for Experience," *Flying Safety,* April 1996.

HOLIDAY "CHEER"?

MAJ RAYMOND E. KING
HQ AFSC/SEPR

'Tis the season to be jolly? Not necessarily! For many individuals—and aviators aren't exempt—the period from Thanksgiving to New Years is the saddest and most stressful time of the year. The "holiday blues" are particularly intense for us in blue because of family separations, limited flying hours (due to inclement weather and mandatory downtime), and perhaps limited financial resources. Seems only Santa Claus and his airborne reindeer get enough flying this time of year.

While personal budgets are stretched to the breaking point and time is in short supply, painful memories of past holiday disappointments may be rekindled (I'm still waiting for *my* pony). All the while, we may think everybody else is having a joyous time. This perception can make those affected feel even more isolated and lonely.

To add fuel to this already combustible mix, alcohol often flows freely. In fact, alcohol is often referred to as "cheer" at this time of year. Many inexperienced drinkers have turned to this seeming "pain killer" or mood enhancer and ended up feeling even worse, perhaps with the added stressor of increased family difficulties or even legal problems. While few may realize it, alcohol is actually a depressant, and its ability to brighten our spirits is fleeting.

Although the media may portray drinking as a glamorous holiday tradition, the results may end up being otherwise. In addition to increasing feelings of sadness, alcohol is often a factor in holiday suicides and traffic fatalities, particularly among young enlisted members. I can't count the stories I've heard from our irreplaceable human resources holding a bottle in one hand and a loaded pistol in the other, and those are the ones who survived. Not very glamorous, is it? (See "Just One Small Drink for the Road?", page 19.)

Loneliness is a common holiday experience. While it's important to not withdraw from others, surrounding yourself with meaningless relationships with others won't cure loneliness. It's possible to be lonely in the middle of a crowd.

On the other hand, military members may find themselves far from family and friends, maybe even lacking adequate social supports. These separations may be even more painful when others seem to be enjoying family gatherings.

The holidays often remind us of former times spent with loved ones who have since died. Divorced military members, particularly those separated from their children, also face particularly difficult times.

So, how to cope with this gloomy picture? To cope effectively with the added pressures of the holiday season, set realistic expectations. Accept that you cannot be all things to all people. Schedule time for yourself. Physically exhausting yourself and spending beyond your means will only result in resentment and increased unhappiness.

Encourage friends to also set more realistic expectations. Often it's wise to agree not to exchange presents with even the closest of friends. Lower expectations of yourself and others. Look out for those who cannot be with their young children during the holidays.

Many folks expect the holidays to be a magical time. With expectations running so high, disappointments are inevitable. For example, the holidays cannot undo years of family tension. It's far better to accept situations for what they are rather than force antagonistic family members to interact with each other. Forget what you see on television. Real life isn't quite so simple.

While sadness during the holidays can be a temporary and normal feeling and not a sign of true (clinical) depression, seek professional help if the sadness doesn't go away after the holidays or if it becomes unbearable. Above all else, let someone (friend, chaplain, flight surgeon, whomever) know if you're hurting, and you'll live to fly another day. ✈

Old Dogs (and Dragons) Can Still Bite

GREGORY V. LEWIS
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Mojave, California

This safety-related article describes a "near incident" that occurred during test pilot student flight-test training. Aircraft mishaps most often happen because the established, carefully constructed safety structure is nibbled away piece by piece. The concept that a "chain of events" precedes any mishap, and how breaking any one of the links in that chain could prevent disaster, is not new. A review of the events during this illustrative sortie may reinforce the need for good discipline and help others to avoid a deadly mishap.

The intent of this article is to help you remember this: Know, understand, and adhere strictly to the safety procedures and policies that were developed long before your flight. A real-time sense of urgency can easily distort perspective, and that's why relying on established safety procedures is likely to save your life.

First, it will be shown that a well-thought-out safety net was organized prior to conducting high angle of attack (AOA) training in a fuselage-loaded aircraft. Then I'll describe the real-time errors that could have resulted in the loss of the aircraft.

The National Test Pilot School

The National Test Pilot School (NTPS) has provided the U.S. Air Force Test Pilot School (USAF TPS) with high AOA flight-test training since May of 1997. The flying training consists of spin demonstration and data flights in the Aermacchi MB-326 Impala (see figure 1). Approximately 30 sorties per class are flown, two per pilot and one for each flight test engineer. The procedures, profiles, and safety planning used on these sorties are identical to those used in support of U.S. Navy training and in the NTPS Professional Course curriculum.

Figure 1. MB-326 Impala

In September of 1997, the USAF TPS also contracted for a number of flights in the Saab SK-35 Draken (Dragon). These flights were intended to provide the students with a unique aircraft to qualitatively evaluate near the end of their course. Twelve students—six engineers and six pilots—were given the opportunity to "qual" the Draken, with the engineers evaluating the weapons delivery systems (which are similar to the F-16's) and the pilots flying the NTPS standard curriculum demonstration flight card for Superstalls. "Superstall" is a term given by the Swedes to denote the Draken's deep stall/spin characteristics. It was in one of these Superstall qual eval sorties that the near incident occurred.

The Aircraft

The Saab SK-35 Draken used in the qual evals is a single-engine, afterburning turbojet fighter, capable of supersonic speeds. The wing planform is a double delta with a very high (80°) sweep angle on the inboard section of the wing (see figure 2). The aircraft flight controls (figure 3) are hydraulically actuated and consist of elevons that are used symmetrically for pitch and differentially for roll control. Pertinent to the high AOA recovery is the fact that maximum lateral authority occurs at neutral pitch stick, and maximum pitch control is available only with neutral lateral stick.

The Draken used for the Superstall training was modified with an anti-spin chute. Compressed nitrogen at 1,900 psi is used to deploy a drogue chute, which then extracts a 13-foot-diameter anti-spin chute on a 150-foot-long riser. Installation of the spin chute requires removal of the standard aircraft drag chute and also eliminates the aircraft's tail hook. The anti-spin chute installation (figure 4) was designed for the Danish Air Force, which was the source of the aircraft used at the NTPS.

High AOA Characteristics

The high AOA characteristics of the SK-35 Draken are similar to the F-16 in that the aircraft will settle into a stable, deep stall at about 60°. At departure, the aircraft typically yaws left and pitches up. The pitchup tendency at stall can be understood by referring to figure 5. The outer wing panels stall first, and as they do, residual lift from the inner wing panels exert energy at a more forward location on the aircraft, upsetting the balancing moments in pitch, thus causing the nose to pitch further up.

The curve of pitching moment vs. angle of attack in figure 6 *(page 16)* shows how even at a very high AOA, with full *forward* stick, the pitchup at stall leads to a stable point. Moving the stick full *aft* leads to a stable point at an even higher AOA, and because of this tendency, it's possible to "rock" the aircraft out of a deep stall. By driving the Draken to an even higher AOA, it's possible to develop a large pitch-down rate by abruptly moving the stick full forward. Doing this may drive the AOA dynamically to a region where it will be possible to regain normal control.

The curves in figure 6, and thus

continued on next page

Figure 2. SK-35 Draken

Figure 3. Draken Flight Controls

Figure 4. Anti-Spin Chute Installation

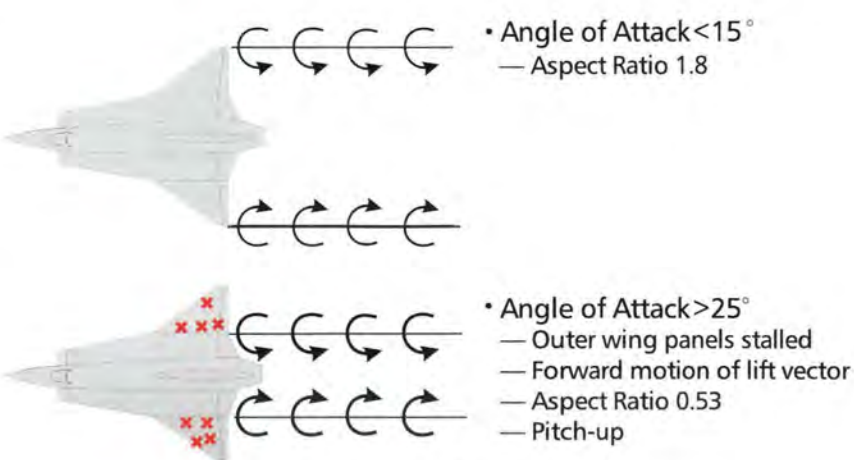

Figure 5. Stall Progression

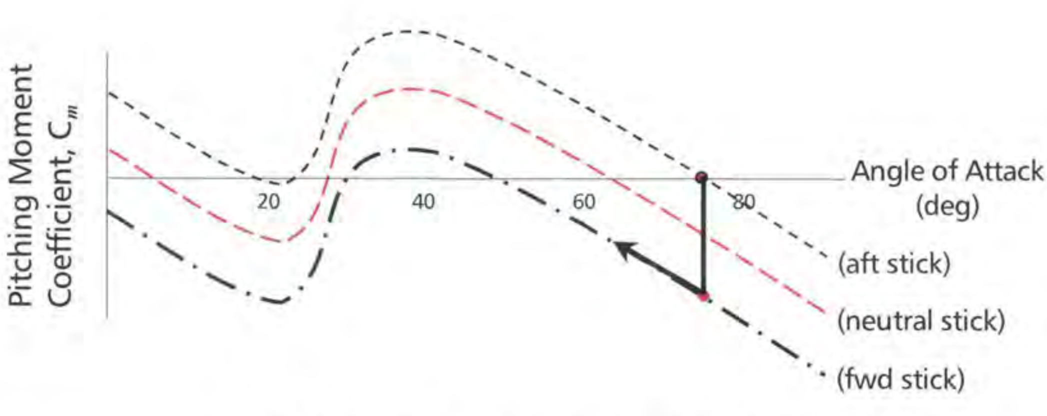

Figure 6. Pitching Moment Variation with Angle of Attack

the concept of *pitch rocking*, assume that the aircraft is *not* in an autorotative couple. Unlike the F-16, the Draken *will* rotate in yaw—typically at a slow rate of 6 to 10 seconds per turn. Therefore, it's important in the Draken that any significant yaw rate be stopped *before* pitch rocking is attempted. In a stable Superstall, the Draken's rudder is ineffective, and lateral control in the direction of the spin is used to stop the yaw rate, making it possible to then pitch-rock out of the deep stall.

Safety Provisions

Because it was considered desirable for the students to experience an out-of-control recovery in a fuselage-loaded aircraft, Superstalls were planned for the pilot qual flights. To simplify safety planning, the staff of the two test pilot schools chose to use the NTPS's standard Draken Superstall curriculum sortie flown at Mojave for all Professional Course pilots. In the detailed description of that standard sortie, safety was addressed, including the following hazard-minimizing items:

• An operable spin chute was prerequisite for the flight.

• Four different Superstall entries were detailed. All of those entries had been previously flown and cleared by school instructors as a part of their checkout training.

• All recoveries were to be flight manual recoveries. No improvisation/investigation of other recoveries was permitted.

• Minimum altitudes were spelled out:

- Entry - 33,000 feet MSL (30,000 feet AGL)
- Recovery Initiation - 28,000 feet MSL
- Spin Chute Deployment - 20,000 feet MSL
- Ejection - 13,000 feet MSL

What Happened?

The near-incident flight was the first and only Draken flight for a student test pilot in the latter stages of his training. The choice of devoting the student's only Draken sortie entirely to Superstalls was a factor in the near incident.

Both NTPS and USAF TPS staffs agreed on the sortie's contents. In retrospect, this choice was a poor one because the Draken is a relatively difficult-to-fly aircraft, and the Superstall profile (clean aircraft, high-altitude entries) results in a very short sortie, typically 35 to 40 minutes flight time. The choice was made because the out-of-control characteristics and the recovery procedures are very interesting from a test pilot training perspective. Also, there was a ready-made profile and card available from NTPS that has been used successfully for years in the NTPS standard curriculum.

However, a major difference between NTPS students and USAF TPS students is that NTPS students *must* have at least four sorties in the Draken before flying the Superstall profile. *Bottom line:* Putting any pilot in an unfamiliar, hard-to-fly, fuel-limited aircraft, in a time-constrained sortie, and then focusing solely on departures and spins, is unwise. This was the first in the chain of errors.

The Draken has very high wing loading (47 lbs/ft^2) and a very low aspect ratio (1.8). At greater angles-of-attack, these two factors result in very high induced drag. Departure speed is very slow, 90 to 100 knots (vs. a best endurance speed of 300 knots for reference). Thus, slowing down to departure speed in the spin area requires being at the right speed and altitude well before entering the spin area. If low on altitude at the last minute, there is not sufficient thrust to make a large correction. Largely as a result of a lack of familiarity with the aircraft, it was difficult for the student to zoom the aircraft properly on the first try, and he ended up entering the designated spin area 2,500 feet lower than that specified as the minimum departure altitude. Being low at entry was the second link in the chain.

When the instructor pilot (IP) allowed the student to continue with the departure, even though the entry was below the minimum briefed departure altitude, the third link in the chain was forged. The real-time rationalization was that an aborted entry would require another complete pattern (5 miles out, 5 miles in) and probably result in the loss of one departure maneuver overall, due to fuel constraints. The IP also believed

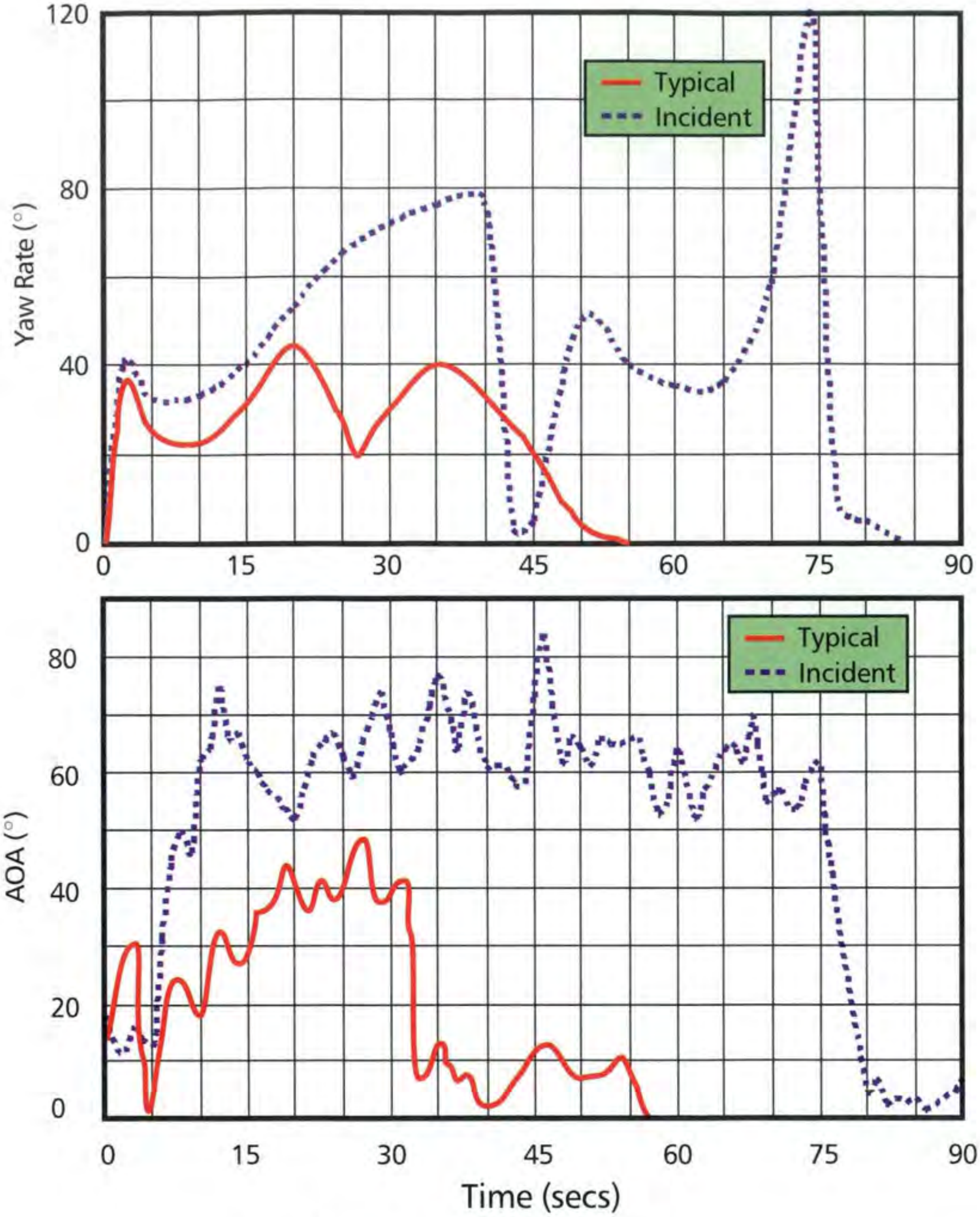

Figure 7. Yaw and AOA Angles in Superstalls

that, based on his experience with recoveries, the student would easily do so on the first try.

The fourth link in the chain was initiating recovery below the briefed minimum of 28,000 feet. Recovery was delayed for two reasons. First, because departure was initiated lower than briefed, and second, as was discussed in the pre-flight briefing, the student was assessing the effect of lateral stick on yaw rate. It's very surprising for new pilots to see how lateral stick movements produce dramatic yawing moments, so overcontrol is typical on the first attempt. However, this student used much larger lateral inputs than the "small inputs" the instructor intended him to use, and as a result, recovery had a higher than normal yaw rate, and recovery initiation was late.

Remember what I said before. *Yaw rate must be stopped before effective pitch rocking can be accomplished.* We still had a yaw component when the student commenced pitch rocking. This was the fifth link in the chain.

In the IP's view, because the whole purpose of the sortie was to let the student experience a unique aircraft departure, spin, and recovery, there was a strong desire to coach the student through the proper procedures. This desire continued beyond the time the IP should have taken control and recovered the aircraft. When the IP failed to take control of the aircraft immediately after realizing the student was recovering improperly *and* at a lower than specified

continued on next page

Be on your guard against complacency at all times, whether it be routine operational flying, flight-test training, or conducting actual flight-testing. While this is obvious, the near-incident in this situation certainly highlights the need to remain ever vigilant.

minimum altitude, link six in the chain was created.

The next link was an omission by the instructor. The minimum altitude for spin chute deployment, if still out of control, is 20,000 feet. This altitude came and went with the instructor *still* coaching the student, because in the back of his mind, he *knew* that every recovery he had initiated prior to this sortie had resulted in an immediate recovery.

The eighth link was that this spin was abnormal. It wasn't that the student had simply misapplied the controls that caused the aircraft not to recover. It was that the yaw rate had increased to the point that pitch rocking wasn't able to overcome the autorotative couple. Figure 7 contrasts a typical Superstall and the incident Superstall. Both AOA and yaw rate were significantly higher than in a normal Superstall, resulting in a more difficult, and thus delayed, recovery.

After taking control, the instructor recovered at approximately 14,000 feet, well below the briefed minimum and just above the briefed ejection altitude. Due to many previous "easy" recoveries, IP complacency was certainly a factor in this case.

Lessons Learned

Be on your guard against complacency at all times, whether it be routine operational flying, flight-test training, or conducting actual flight-testing. While this is obvious, the near-incident in this situation certainly highlights the need to remain ever vigilant.

High stress situations (especially the first time they are encountered) can cause any pilot to make errors. A gradual buildup is as important to pilot performance as it is to engineering knowledge. Carefully assess the level of stress from the student's point of view and take appropriate steps to put the stress at a level commensurate with both training objectives and safety of flight.

Don't combine envelope expansion with training. Strictly adhere to previously flown and cleared demonstration profiles, especially when doing out-of-control flight-test training. Also, minimize miscommunication by avoiding ambiguous terms ("small inputs") when briefing maneuvers.

Safety of flight is a higher priority than maximizing flight-test training effectiveness. In time-critical situations, such as out-of-control recoveries, the instructor should take control and recover sooner, rather than later, if briefed decision points are reached, or if unexpected events occur.

For NTPS Superstall Demonstration flights, the above lessons learned translated into specific recommendations:

- Strictly adhering to briefed minimum altitudes.
- Providing familiarization flights prior to conducting departures.
- Following demonstration profiles to the letter—no deviations.
- Specifying minimum altitude for the instructor to initiate recovery if the aircraft is still out of control.

Finally, this near incident reemphasized that a well-planned safety net, constructed long before the flight, can be nibbled away, bit by bit. On this particular sortie, removing any of the following links would likely have prevented the "near incident":

- The first sortie was devoted solely to high AOA, without regard to student inexperience in aircraft type.
- At departure, the aircraft was below briefed altitude.
- The IP allowed the student to continue.
- At recovery initiation, the aircraft was below briefed altitude.
- Pitch rock was used to attempt recovery from the departure before yaw rate had been eliminated.
- Instead of taking control and initiating recovery, the IP tried to coach the student through it.
- The spin chute was not deployed, even after flying through the briefed minimum altitude.
- The spin was abnormal and took longer than normal to recover. ✈

About the Author

Gregory V. Lewis is the Deputy Director of the National Test Pilot School. Among other duties at NTPS, Greg instructs high AOA testing in both the MB-326 Impala and the Sk-35 Draken. Greg joined the National Test Pilot School after serving 20 years in the U.S. Air Force. During his USAF career, Greg attended the USAF TPS and later instructed there. USAF flight testing experience included an assignment with the F-16 Combined Test Force and 3 years testing the F-15 Short Takeoff and Landing Demonstrator aircraft.

In Small Doses, Alcohol Has Odd Effects

FREDERICK V. MALMSTROM, Ph.D.
Certified Professional Ergonomist

It's the season for a little holiday cheer when alcohol becomes Everyman's drug of choice. Alcohol is a universal by-product of nature which is probably the most studied and yet the least understood. It has the power to shorten life and befuddle, yet it has been shown to lengthen life and invigorate. In short, alcohol has something to both offend and delight everyone.

This article isn't addressed to the fall-down drunks—those unfortunate people have their own AA meetings to attend. This is for the average guy in the cockpit. Alas, contrary to urban myths, the great majority of pilots aren't legendary boozers who seek out barroom brawls and collect DWIs like Green Stamps. They are—like you and me—casual drinkers who can sip a highball or two and leave it at that.

Much of the information passed out during mandatory alcohol and drug education is geared to the long-term effects of heavy boozing—liver damage, broken homes, etc. That information isn't exactly wrong, but it doesn't give the whole picture, especially about the effects of *small* doses of alcohol. I'd like to clarify and correct some misconceptions and then offer advice to ourselves, the casual drinkers.

So You think Alcohol Is a Depressant?

The information given to the general public is that alcohol is a depressant. Well, not exactly. It's a stimulant, too. Unlike those classical depressants, phenobarbital and morphine, and those classical stimulants, amphetamine and cocaine, which seem to be tailor-made for specific brain receptors, alcohol has the unfortunate ability to invade and saturate nearly every cell of the body, not unlike the effects of plowing a rose garden with a bulldozer. It's the lack of specific effects that makes alcohol research so frustratingly elusive.

Since our 3-pound brain utilizes a massive 20 percent of our total body metabolism, that organ is a sitting sponge waiting for alcohol absorption. To backpedal a bit into basic chemistry, the ethanol (i.e., grain alcohol) molecule is an extremely simple and small structure which is *both* fat and water soluble. It's easily and quickly absorbed through the tongue, stomach, small intestine, and passes readily through the blood-brain barrier. Hence, in small quantities, alcohol can activate both the sleep and arousal centers at the same time. It's only in huge doses that it has the power to stupefy and depress. Having that small "nightcap" can also have an opposite, stimulating effect, leaving you wide awake.

Does Alcohol Destroy Brain Cells?

While it's true that alcohol abuse does wreak a lot of

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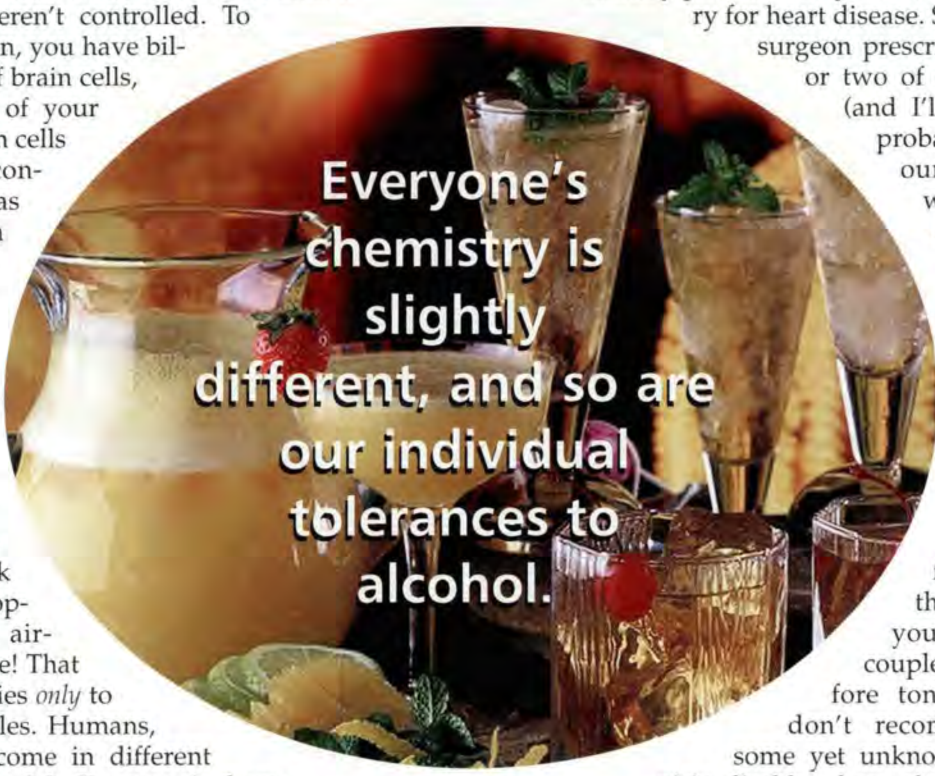
bodily damage, and it's also true that pure alcohol is a powerful solvent, direct destruction of brain cells *isn't* one of those effects. Back in 1990, the popular press picked up on a study by some pathologists who weighed the brains of alcoholics and nonalcoholics and observed that deceased alcoholics had lighter brains. This may have been so, but there was no sound reason to jump to the next conclusion that alcohol was a direct cause of the brain weight differences. Other factors like malnutrition and age weren't controlled. To misquote Carl Sagan, you have billions and billions of brain cells, so the probability of your running out of brain cells due to alcohol consumption is about as likely as the sun running out of nuclear fuel in the next decade.



The Myth of the Typical Drinker

Most general literature tells us our bodies can safely metabolize one alcoholic drink per hour and still operate that car or airplane safely. Beware! That rule of thumb applies *only* to young, healthy males. Humans, like automobiles, come in different years, colors, and models. Everyone's chemistry is slightly different, and so are our individual tolerances to alcohol. It's a fact that about 50 percent of persons of Asian descent lack sufficient stomach and liver enzymes to metabolize alcohol efficiently, so toxic intermediate by-products of alcohol breakdown collect in their systems, leading to some quite unpleasant side effects of nausea and dizziness known as the "alcohol flush." Likewise, young females have fewer alcohol metabolizing enzymes than young males. Hence, everything else being equal, pound for pound, a young woman will probably get tipsy faster than a young man. So will a 40-year and older man.

Wine and Heart Disease

In both 1996 and 1997, there were widely circulated reports from the U.S. Department of Health and Human Services and the *New England Journal of Medicine* that an alcoholic drink or two a day *reduced* a person's risk of heart disease. In fact, epidemiologists had noticed as far back as the 1970s that the French, who consume a lot of red wine and yet eat lots of fatty foods, also had low incidences of heart disease. However, these findings shouldn't have been that surprising. Despite the press furor generated over the beneficial effects of alcohol, keep in mind that for decades many savvy cardiologists have recommended to their patients small doses of liquor—precisely for its stimulant qualities.

But, before the reader leads a stampede to the Class VI Store to stock up on Beaujolais as a heart attack preventative, keep this also in mind: You can reduce your risk of heart attack much more effectively by losing weight, exercising, and quitting smoking. Besides, your average military pilot is hardly in the high risk category for heart disease. So, if your flight surgeon prescribes you a glass or two of red wine a day (and I'll bet he or she probably won't), be our guest. Otherwise, if you don't drink, there is no good reason for you to start.

Aspirin and Liquor Don't Mix, Either

In dreaded anticipation of flying hung over the next day, have you ever taken a couple of aspirin before tonight's party? I don't recommend it. For some yet unknown reasons, aspirin disables those alcohol breakdown enzymes, thus intensifying the effects of alcohol and keeping it in your bloodstream longer. Hence, you should probably save the aspirin for after the party. If you take the aspirin beforehand, you may decrease your hangover effects but prolong the buzz. Likewise, it's well documented that certain classes of prescription antidepressants (like Paxil™ and Prozac™) and benzodiazepine tranquilizers (like Xanax™ and Valium™) have multiplier or synergistic effects when mixed with even small amounts of alcohol.

Will Just a Wee Nip Affect My Flying?

Most aviation-related studies seem to confirm one alcoholic drink doesn't affect routine flying duties. Gross measures of flying ability such as balance, coordination, reaction time, and orientation aren't affected. If that is so, then why shouldn't the FAA permit every pilot to have just one small one for the road?

You've probably guessed the catch here is the word "routine." A small dose of liquor doesn't interfere much with grossly *overlearned* skills like bicycling, driving, and flying, but it certainly has subtle interference with the ability to both learn new procedural responses and perform complex tasks. And it also increases in the pilot a sense of confidence, perhaps overconfidence. Therefore, if I were an airline passenger who could absolutely predict the flight would be routine, I'd feel safe with a pilot who had a drink or two prior to takeoff. But heaven help the drinking pilot who comes up against a situation he hasn't seen before.

Alcohol and Caffeine

So the final question is, if you need to sober up quickly, will a cup of coffee or a bottle of caffeine-laden cola do the trick? This coffee question has been batted around for centuries, but it's only within the past decade that the answers have begun to emerge. The answer is both yes and no. Fact is, alcohol and caffeine are antagonists, and they *do* offset each other's effects—but only up to a point. The main pharmacology problem in using coffee to sober up is that whereas caffeine has a plateau effect, alcohol doesn't. In other words, after 5 cups of coffee, you're about as wired as you can get. There is no ceiling on how inebriated you can get. Too bad, because if that weren't the case, you could gulp down five rum-and-colas in 15 minutes without feeling a buzz. Yes, a good strong cup of coffee will offset most of the effects of *one* drink, but after that one drink, your system becomes swamped by alcohol.

Some Recommendations

Let's be fair. Light alcohol consumption may have some beneficial effects, but those effects don't include flying duties where both complex procedures are required and unexpected events will pop up. The old rule of thumb of abstention, 12 hours from bottle to throttle is still a good one to follow—but only if you're a young, healthy Caucasian male. If you don't fit that category and, for example, happen to be over 40, Asian, female, and/or taking prescription drugs (or even aspirin), your body may require a great deal more time to offset the effects of even one drink. Check it out with your flight surgeon. For further factual and entertaining reading, I also recommend Stephen Braun's 1996 paperback book *Buzz. The Science and Lore of Alcohol and Caffeine.*

THE LT GEN GORDON A. BLAKE AIRCRAFT SAVE AWARD

MSGT JAMEY WILLIAMS
HQ Air Force Flight Standards Agency

The following individuals received the Lt Gen Gordon A. Blake Aircraft Save Award for the second quarter of calendar year 1998:

TSgt Joel G. L. Patrick (Tower, Watch Supervisor), 49th Operations Support Squadron, Holloman AFB, New Mexico. During a period of busy and complex air traffic at Holloman AFB, an F-117 reported his gear down to the local controller. While the local controller's attention was with traffic in the overhead pattern, TSgt Patrick observed the F-117 without gear. He immediately instructed the local controller to advise the pilot that the aircraft's landing gear did not appear to be down. A "check wheels" call was made to the pilot, who then lowered his gear on short final and landed safely. TSgt Patrick's situational awareness averted a potential hazardous situation.

Amn Latisha R. Gray (Local Controller Trainee), 88th Operations Support Squadron, Wright-Patterson AFB, Ohio. On a calm Easter Sunday, a Piper Cherokee requested a takeoff clearance, and Amn Gray cleared it. With all controllers in the tower observing the takeoff, Amn Gray was the only one who noticed that the right main landing gear and strut departed the aircraft at liftoff. She immediately informed her monitor, who informed the pilot, and then called the base Aero Club Supervisor of Flying. Amn Gray observing the gear fall off when the aircraft was only a few feet off the ground was truly remarkable! The pilot felt a bump on takeoff but thought it was just the rough surface of the runway. The pilot was en route to another airport to practice touch-and-gos. Had Amn Gray not observed the gear falling off, the pilot would not have been prepared to compensate for the lost gear. Amn Gray's attention to detail and awareness of her surrounding environment prevented a possible disastrous situation for pilot, passenger, and aircraft.

HAZARDOUS AIR TRAFFIC REPORT

HAZARDOUS AIR TRAFFIC REPORT

MSGT JAMES K. ELLIOTT
HQ AFSC/SEFO

This article gives you a breakdown of FY98 reportable incidents (figure 1), some trends, HATRs by location and MAJCOM (figures 2 and 3), and some future changes to the HATR Program.

Trends for FY98 Reportable Incidents

There were 81 HATRs filed from 1 October 1997 through 30 September 1998. Near Midair Collisions (NMAC) represented approximately 53 percent of the HATRs filed. These incidents involved:

• VFR aircraft not using "see and avoid" procedures (majority).

• Separation errors by ATC.

• Pilot not adhering to ATC instructions.

Pilot procedures were second with 11 percent. ATC Services and Ground Incidents were tied for third with 10 percent. Examples of these incidents were:

• ATC separation errors.

• Communication problems between controllers and pilots.

• Questionable controller judgment.

• Unauthorized vehicles on an active runway.

Communication problems were fourth with 9 percent. The "Other" category was next with 6 percent. FLIPs/NOTAMs had 1 percent, and Publication/Directives came in last with no incidents for FY98.

Future Changes

Several changes to AFI 91-202, *Attachment 3, Hazardous Air Traffic Report Program,* are in the works to improve the HATR Program. They are:

• Establish functional procedures for international reporting.

• Streamline Table A3.2., List of Addresses for HATRs, by placing communications center message addresses on this list.

• Create an address indicating group (AIG) #9791 that sends all HATRs to the following agencies: HQ AFSC/SEF, HQ AFFSA/XA, MAJCOM SEs/DOs/ATs, NAF SEs and DOs, HQ FAA/AAT-4 and ASY-300, and Navy and Army safety centers. This new AIG will eliminate the confusion on where to send HATRs.

• Update Table A3.1, FAA Air Force representatives and regional boundaries by state.

Other initiatives include:

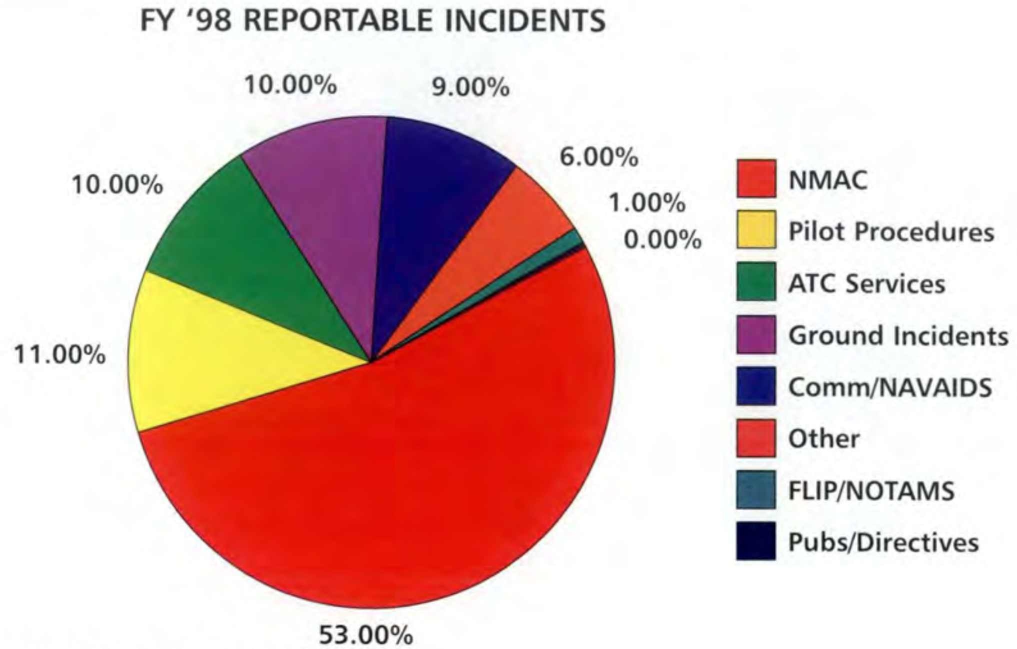
• Update AF Form 651, Hazardous Air Traffic Report Form.

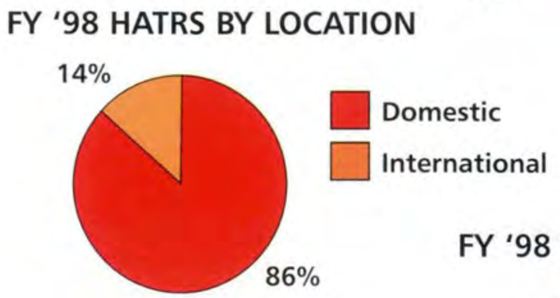
• Creating a HATR web site (http:// www-afsc.saia.af.mil/AFSC/RDBMS/Flight/fltops/home.html).

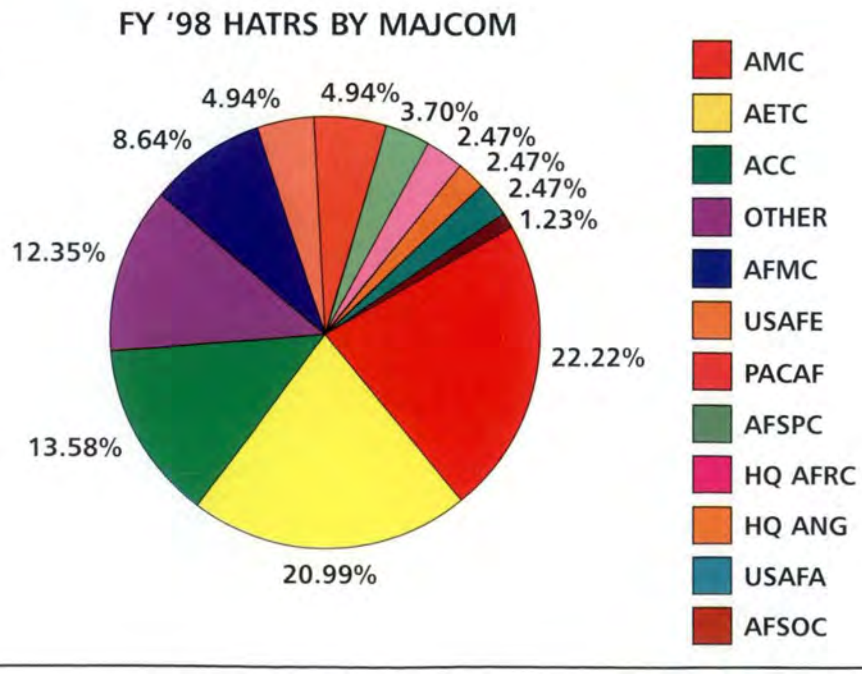
• Establish ties with international aviation organizations to attain agreements for the exchange of HATR-type information.

Conclusion

Efforts continue to simplify and encourage HATR submissions. Send your comments to HQ AFSC/SEFO, 9700 "G" Avenue, S.E., Kirtland AFB NM 87117-5670; call DSN 263-2034, or e-mail elliottj@kafb.saia.af.mil.







An Inspiration to All Who Knew Him

CAPT STEVEN P. DICKEY
Andrews AFB, Maryland


M.J.(Jeff)Simpson, sitting in cabin.

Everyone liked Jeff. He was one of the most popular guys in our school and one of my very best friends. Very bright and motivated, he had career plans of becoming a pilot or astronaut. Jeff Simpson was the "all American" boy. He excelled at everything—sports, academics, hobbies—he was class president 3 out of 4 years and highly ambitious. As it turned out, Jeff went on to create and lead a highly successful contracting corporation in Fort Lauderdale, Florida. I was not surprised to hear of his success. I always figured a goal-oriented person like Jeff was destined for greatness.

I hadn't seen Jeff for many years, and while on a Florida vacation in February 1998, I decided to look him up. What I discovered next, and the impact it had on me, is why this article is in your hands.

The receptionist at M. J. Simpson Corporation answered my call in a pleasant and helpful voice. I asked if her boss, M. J. (Jeff) Simpson, could be my friend Jeff I had known so many years ago. She said, "Probably not, sir. Mr. Simpson passed away nearly 2 years ago." From this, I envisioned an elderly and, therefore, different Mr. Simpson than my friend. I responded, "Okay, this must not be him because Jeff is my age, and I'm only 37." *She then told me Mr. Simpson was about that same age, and he had died in a plane crash!*

An inspiration to all who knew him. These were the words I somberly read as I stood beside my friend's grave. I remember thinking to myself: "How could this be? This just isn't possible." With deep sorrow and grief, I wondered how my amazing and seemingly invincible friend could have met such a fate. What follows is a description of that fateful flight and what likely caused it to abruptly end in catastrophe. Maybe we can all learn some lessons from Jeff's tragic death.

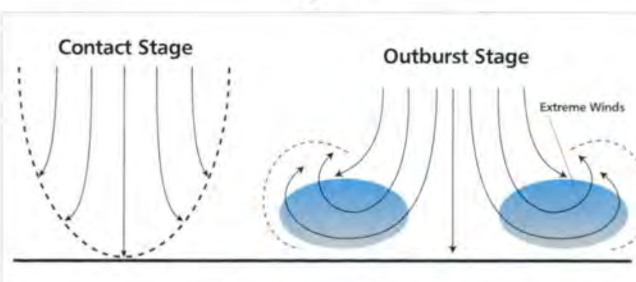
The Fateful Flight

The National Transportation Safety Board (NTSB) concluded: "Probable cause of this accident was the pilot's failure to maintain visual flight conditions which resulted in the loss of control and subsequent in-flight breakup of the airplane when he exceeded the design stress limits of the airframe." Sounds a bit cold, doesn't it? The actual report (NTSB ID: ATL96FA066) is some 36 pages in length and contains details far beyond space available for this article. But we must take at least a brief look at Jeff's flight.

On the morning of 15 March 1996, Jeff (flying alone) departed Executive Airport located near his business in Fort Lauderdale, en route to Indianapolis, Indiana. The aircraft was a six-seat Cessna 310R, tail number N447T. His plan was to stop for fuel in Athens, Georgia, then onward to Indianapolis. The first leg of this nearly 1,100-mile flight went without a hitch. However, while approaching his planned stop in Athens, Jeff couldn't help but notice a rather ominous-looking sky toward the west.

Transcripts of the conversation between Jeff and an Automated Flight Service Station (AFSS) weather briefer clearly indicate Jeff's concern about the line of thunderstorms which lay northwest of Athens—a line which formed an imposing barrier laced with a multitude of hidden dangers. Although we learn thunderstorm basics in flight school, few of us ever really gain the level of understanding and respect these rogue warriors of nature deserve. It was obvious in his 4-minute conversation with the weather briefer that Jeff attempted to gather all

Figure 1



information he could about the current and forecasted position of these storms. Sadly though, this wasn't enough to save his life. Jeff's last comments to the briefer were, "Okay, I'll sit tight for a couple of hours and then give you a shout back." The AFSS never heard from him again.

Approximately 50 minutes later, at 1420 EST, Jeff was issued taxi instruction for a runway 27 departure. At 1425, the flight was cleared for takeoff. At 1445, two Georgia Department of Natural Resources enforcement agents were standing on the shoulder of Flanagon Mill Road in northwest Barrow County (29 miles west-northwest of Athens airport, just 4 miles past Winder, Georgia) when they heard not only the familiar sounds of thunder, but also a sound resembling "incoming artillery." Since this odd sound soon mixed with the sound of more distant thunder, they didn't give it much thought other than it sounded "unusual." Within a minute, they heard a similar sound, this time much louder and closer with about a 3-second duration. At this point, they looked up into the heavy overcast base of a cumulonimbus (thunderstorm) cloud and saw no fewer than 20 metal pieces of debris falling from the cloud base. With the majority of large pieces impacting to the west and south, they ran east for cover. The largest pieces impacted on the south side of the road. At this point, they reached for their mobile radio and called in a small plane crash at their location. Time on the 911 log: 1448 hours. The awesome, unforgiving power of nature had just ended my friend's life.

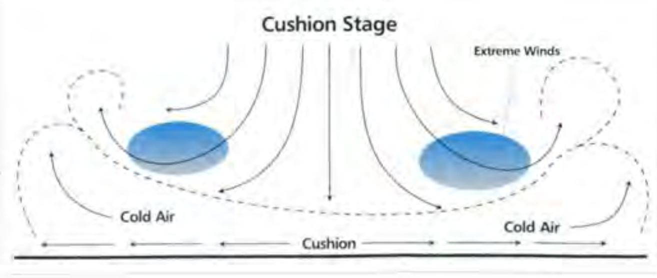
So, what can we learn from this tragedy? What can we take away from this loss of life that may save our lives one day? First and foremost, we are mortals with strong purpose, but made only of fragile flesh and bone. We can never afford to underestimate the deadly forces of a thunderstorm and its many hazards, the most deadly for aviators likely being the microburst.

In Jeff's case, judging by the total in-flight breakup of his aircraft and subsequent 4,700-foot path of scattered debris, he was the victim of such a microburst. In order to enhance your own personal safety, you owe it to yourself to learn about this violent act of nature which, as we have seen, can quickly result in catastrophe.

Downburst Classification

Damaging thunderstorm winds have been termed "downbursts" by renowned severe storm researcher Dr. Ted Fujita. He further classifies these events as macrobursts (outflows of > 2.5 miles in diameter), and microbursts (outflows < 2.5 miles in diameter). Generally, a macroburst is on the scale of the entire cold air outflow field of a thunderstorm or group of thunderstorms; whereas the microburst is a sub-thunderstorm scale outflow feature—smaller, more focused, potentially devastating to aircraft, especially during takeoff and landing phases of flight. Keep in mind a microburst releases sufficient energy to down the most powerful airliner or the fastest, toughest fighter humankind can invent. Simply put, you are no match for this force. Your defense: Understand it; stay away from it!

Figure 2



Development of a Microburst

A microburst initially develops as the downdraft begins its descent from the cloud base. The downdraft accelerates, and within minutes reaches the ground (contact state). It's during the contact stage that the highest winds are observed. During the outburst stage, the wind "curls" as the cold air of the microburst moves away from the point of impact with the ground. During the cushion stage, winds about the curl continue to accelerate, posing an extreme threat to nearby aircraft.

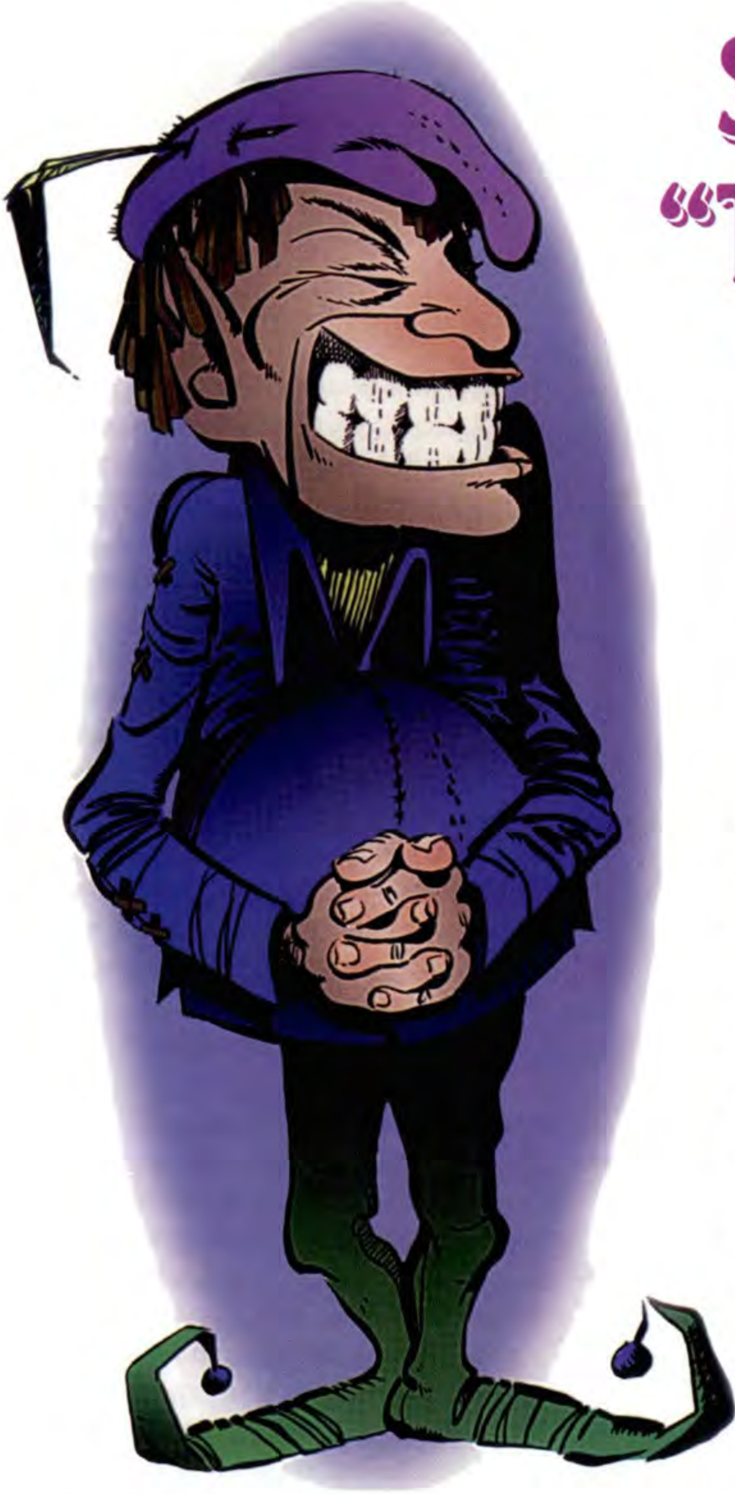
From the figures, you can see how a microburst can be devastating. For example, while on final approach, depending on runway orientation and the relative position of the storm, you can cross the downdraft in such a way that a 50-knot (or more) headwind can suddenly become a 50-knot (or more) tailwind. The associated loss of lift will be substantial. Can you recover?

Or worse yet, as was likely the case for Jeff, you may encounter the extreme wind as it is moving in a downward direction, pushing your aircraft to the ground. Attempts to recover may overstress the airframe, resulting in structural failure—that is to say, your airplane can break apart in flight. We have seen that it can happen.

There is some good news, however. It has been determined that only about 5 percent of all thunderstorms produce a full-blown microburst. Also, the average life span of a microburst is only 15 to 20 minutes. As the name implies, it is a localized, short-lived phenomenon, so your chances of encountering one are low. However, if you do, especially in a light aircraft, your chances for survival are also low.

Eulogy

Jeff did not deserve to die—no serious aviator ever does. He was a beloved son and brother and a dear friend to many, including me. He was full of life, his outlook purely inspirational. He was a good pilot. His only shortfall? A lack of experience, maybe just like you and me. Learn all you can from his story. Let it inspire you to study more about aviation hazards. Celebrate Jeff's life, for the world is a much better place because of it. But also remember his fate the next time you are faced with tough choices. I believe he would be very glad you did. ✈



SHAKESPEARE
"TO THINE OWN

Late winter and early spring are cold s
Much has been said about self-medication, su
Arfin® to overcome a sinus block. This over-th
prevent the complications of flying with a col
with all episodes of self-medication, any flight
So, to admittedly stir the pot a little, her
comment from the Naval Safety Center Surgeo

LT ROBB WEBB
Courtesy *Approach*, Mar 98

It was one of those rare good deals. Because the weather back in Texas was the typical winter trash, the squadron sent a bunch of us students to NAF El Centro to generate some ACM "X's." Raging around the CAVU desert in TA-4Js, mere sorties away from getting our wings—it just doesn't get any better.

At the end of 2 weeks, our confidence was sky high, and we were looking ahead to upcoming carrier qualifications. Unfortunately, the combination of the desert dust and an oncoming head cold concerned me. As I closed the canopy while taxiing for a 1 v 1 hop, I knew things were not right.

My sinuses protested the slight overpressure on deck, but I could clear my ears, so I pressed on. After all, I had my emergency bottle of Afrin® in my flight suit, just like the doc recommended. After barely making it through a slow descent from the MOA, I decided to snivel out of the next day's flying and asked to catch the airlift home in 2 days.

I planned to spend the next day in the rack trying to get healthy, but things changed quickly. A rapidly moving cold front descended on Texas and had already dumped snow on Dallas. Ops wanted to beat the storm home and decided to launch the Skyhawks immediately.

At the same time, they insisted that we not just ferry the jets but fly air-navs on the way home. This left me in a tight spot. I knew I was not feeling 100 percent, but the squadron made it clear they had to justify every flight hour. Since I could still clear my ears, I decided that I could probably hack it.

The single leg home was right on the edge of a TA-4J's max range, necessitating a high-profile ramping up as the plane got lighter. To make matters worse, the weather forced us to deviate from our planned route. Two hours into the flight, I knew we were looking at an idle descent from the high 30's. Cabin pressure was in the mid-20's as I started the penetration.

As the cabin pressure stabilized at 8,000 feet, I felt a blinding pain in my forehead. I immediately leveled off and had the IP take the jet. I inhaled half my Afrin® bot-

SAID IT BEST:
SELF BE TRUE"

asons. Of course you can get sick at anytime. h as the crew-dog who thought he could use e-counter medication, however, is not likely to l and could foster a false sense of security. As urgeon will tell you, *"Don't!"*

is another article supplemented by a definitive .

tle to try to make the pain stop. By now, I was nearly incapacitated with pain from my front sinuses. The IP quickly reminded me that we had to get down now for fuel.

By the time we leveled at 2,000 feet, the pain had subsided a little, and I could land the jet myself. Walking back to the hangar, I noticed blood in my mucous, and I knew I had done some serious damage.

The flight surgeon confirmed what I suspected and promptly grounded me. After 2 months of antibiotics, sinus operations, pressure chamber rides, and watching all my classmates get winged, I was finally back in the cockpit, much wiser about my personal limits and instincts. You have to learn when to put your own concerns ahead of squadron plans. As Shakespeare said: "To thine ownself be true." Later, when I was a sergrad in the same squadron, several students learned the hard way, as I had, by injuring sinuses and eardrums.

A bottle of Afrin® won't save you when you know you shouldn't be flying.

A sinus block can be painful, disabling, and may result in a prolonged recovery. But the dangers of flying with a cold may go far beyond the complications of a sinus block. When you have a cold, the associated inflammation and swelling of the mucous membranes throughout the respiratory tract could include problems with the inner ear and the vestibular apparatus that is responsible for balance and sense of position in space. If a cold causes problems with your inner ear and vestibular system, vertigo and spatial disorientation could develop. These medical complications would be far more disabling than a sinus block.

The aviator in this story decided he could fly with a head cold and hack it, partly because he had his "emergency" bottle of Afrin® tucked in his flight suit, "just like the doc recommended." The flight surgeon in the story didn't do anyone a favor and was partly responsible for the false sense of security that could have led to a disaster.


Robert Trotter
color - Laurinda Minke

Afrin® did not prevent the complications of flying with a cold, and it is unlikely that it will. Afrin® is not an authorized medication for aviators in a flight status. If an aviator's condition warrants the prescription of Afrin®, the flight surgeon should consider temporary grounding. A bottle of Afrin® should never let you feel you can fly when you shouldn't.—Capt James Fraser, MC, Naval Safety Center Surgeon.

Maintenanc

Will You Kids Please Stop Slamming Those Doors!

Two worker bees had just finished a job and climbed into their step van to head back to the shop. They climbed in through the sliding doors, fastened their safety belts, and proceeded. Everything was hunky-dory until they approached the first "Stop" sign. As the driver slowed the van, his sliding door remained open. The passenger's sliding door was open too, but, since *it wasn't locked* in the "open" position, it accelerated forward with incredible speed and lots of momentum. Suddenly, the door was completely closed. And latched. Not a big deal, except that the passenger's hand was braced against the front edge of the doorframe when the slider slammed shut. Result? One severely crushed finger. Lesson learned? Don't place hands or other precious body parts in the path of (potentially) moving objects!

Improper Bleeding = Needless Bleeding

Three airmen were performing routine maintenance checks on a B-4 stand with one of the airmen positioned on the platform. During the course of the checkout, the airman on top of the platform stated it felt "spongy" in the raised position. When this condition exists, it's almost always due to air in the hydraulic system, and applicable tech data provides step-by-step procedures for remedying it.

The right tech data was available at the job site. *Available,* but not used.

One of the two airmen on the ground indicated he knew how to correct the problem and took charge. Because of the sequence of events that followed, we can presume—reasonably—at some point here, he said "Watch this" to his two fellow maintainers and moved under the workstand. He was going to demonstrate a "shortcut" (translation: a procedure not prescribed by tech data) for bleeding air from the system. With the airman who was originally on top of the elevated platform still there, and no safety pins installed, the airman had chosen to crack open the hydraulic line fitting attached to the hydraulic ram that's used to raise the platform—instead of cracking open tech data.

While in an awkward, squatting position, he placed his hand on the stand's frame to steady himself while loosening the hydraulic fitting. He bled the air out of the line and was re-tightening the fitting when it happened—the hose fitting blew off. And in less than a nanosecond, the full weight of the elevated platform and its occupant collapsed on the four fingers of the hand he was using for balance.

After the man on the platform climbed down and the stand could be raised enough to permit it, the injured airman freed his fractured fingers and was transported to a medical treatment facility. After some surgery, a day in the hospital, and several days on quarters, he was released back to his work center with a prognosis for complete recovery.

In retrospect, you can draw several conclusions from this unfortunate airman's mishap, but here are a few. *One.* When someone says "Watch this," dissuade them or be prepared to dial 9-1-1. *Two.* The airmen who witnessed this event will depend on tech data a lot more than they ever did before. *Three.* All three airmen will regale future trainees with tales of this mishap for years to come and admonish them to always use tech data. *Four.* That's why they're called "Safety Pins." Use them. And *Five.* Often, the longest distance between two points is a shortcut. Be safe and follow tech data.

ce Matters

Bent Back Follies

We in the maintenance world are one "can-do" bunch. But sometimes we let pride or a false sense of urgency overcome common sense. We neglect to ask for help when needed and needlessly injure ourselves. Here are two recent examples.

Scenario One. Some aircraft troubleshooting necessitated use of a test set, but to get it to the jet, the airman needed to load it in the back of a truck. In preparation for doing a swift clean-and-jerk of the 85-pound dead weight from ground level, he bent over at the waist, kept his knees straight (is that the way you do it?), and promptly—you guessed already, didn't you?—wrenched his back right out of joint. From this painful, semipermanent, toe-touching vantage point, we speculate he could clearly see the "Two-Man Lift" label on the test set.

Scenario Two. Two NCOs were loading an engine generator in the back of a truck to transport it to an aircraft. Total weight of the generator and its shipping container? A whopping 200 pounds! While carrying it the 4 feet from an equipment cart to the back of a truck, one of the NCOs twisted his body at the waist and—you guessed again, didn't you?—strained his back.

These instances cost both maintainers some time in the hospital and several days on quarters. Unfortunately, they'll probably be nagged by persistent back pain for quite a while.

Reminder: Chapter One, "Manual Material Handling," in AFOSH Standard 91-46, *Materials Handling and Storage Equipment,* contains valuable information that can help prevent these types of injuries. Besides providing ground rules for the handling of weighty objects, it also gives "how to" techniques that will prevent the types of debilitating back injuries described above.

Final Score: Pintle Hooks 3, Fingers 'n Hands 0

Food for thought: *There are no small jobs in maintenance.* Three recent mishaps prove once again that even everyday, routine tasks can be hazardous to your health.

In the first mishap, an individual was helping maneuver a trailer carrying a 1,000-gallon capacity oil bowser—which was full—into position so that it could be moved. The trailer tongue length was 3 feet, so the shop tug was positioned so that its pintle hook was approximately 3 feet in front of the bowser trailer. The rear wheels on the trailer are equipped with foot-pedal parking brakes, which were properly set, and the trailer tongue is attached to the two front wheels for steering. The mishap worker picked up the trailer tongue and moved it around so it would line up with the tug's pintle hook. This caused the bowser contents to shift and the trailer to move forward slightly—just enough to crush his left hand between the pintle hook and the trailer tongue.

In the second scenario, the mishap worker was disconnecting a hydraulic mule from the tow vehicle. He lifted the mule's tow bar tongue to the upright position, then reached down to put the safety pin back into the tow vehicle pintle hook. Unfortunately, he failed to ensure the hydraulic cart tow bar was locked in the upright position, and it fell down, crushing his thumb between the pintle hook and tow bar.

In the final mishap, an individual was attempting to connect a light-all to a bobtail. He released the brake on the light-all and began pulling it over to the bobtail's pintle hook. The unit was parked on a slight incline, so the initial pull caused it to roll faster than the mishap worker expected. He was concentrating on slowing it down and failed to realize how close the tow bar *and his fingers* were to the pintle hook on the bobtail. Result? One crushed finger.

There are no small jobs in maintenance. Maintain situational awareness and be safe! ✈

Crossfeed

A Hair-Raising Experience

AD2 JEFFERY HARLAN
Courtesy *Mech*, Jul-Sep 98

Long hours turning wrenches to maintain mission-capable aircraft can be tedious until something goes wrong. Then, you had better know what to do and do it quickly. Training prepares us for the dangers we face each day.

I was borescoping No. 1 engine during extended phase maintenance when I smelled something burning, and my borescope probe and optical tube got very hot. Thinking I was imagining it, I asked a shipmate if he smelled anything and if he too thought the borescope was unusually warm. He confirmed that something very strange was occurring. Another shipmate saw smoke coming out of the light source. My hair was tingling.

As I'd been trained to do, I set down the borescope, unplugged the light, and headed to maintenance control to tell them I had a problem with my test set or electrical outlet. On my way to the office, I saw a light cloud of smoke in the hangar and detected the acrid smell of an electrical fire. I looked around and saw that the aircraft's grounding cable was burning. One of our QA reps also saw the fire and ran to secure hangar power from the aircraft. After it was secured, another maintainer rushed to the grounding cable and kicked it away from the aircraft. The fire was quickly extinguished. Then I made the mandatory trip to the doctor; you can never be too safe when electricity is involved.

Investigation revealed that the electrons powering our tools almost chose me for a ground but decided on the grounding wire because the aircraft was correctly grounded. No wonder the hairs on my neck started to tingle! The electrical shop and public works personnel found a short where the power cord connects into the hangar-power unit. They determined that 115 volts had shorted to a neutral contact on the power cord and energized the skin of the aircraft.

Training and teamwork kept me from becoming a maintenance statistic. There wasn't time to look in a book or ask questions. All my shipmates handled this incident correctly and responded swiftly.

Never think that grounding an aircraft is trivial.

How Qualified Are YOU?

AME2 TIMOTHY TABER
Courtesy *Mech*, Jul-Sep 98

In today's Navy, maintenance people have to be more qualified than ever before even for day-to-day tasks ashore. "Extra" qualifications help relieve some of the workload from other work centers and increase your value within your squadron.

During the air wing's third day of cyclic ops, our maintenance control chief called the AME work center and reported possible FOD in the cockpit of aircraft 621. A flight-deck troubleshooter had searched for the FOD but didn't find it. The work center's CDQAR (Collateral Duty Quality Assurance Representative) gathered his tools and protective gear and headed for the roof (flight deck).

The FOD search continued through the launch. Then the handler told the CDQAR that his yellowshirts needed to move the aircraft from forward of the island to the finger area just aft of elevator 4. The CDQAR told the handler that he was a qualified brake-rider and would stay with the aircraft for the move.

With the director leading the way, the towed aircraft crossed the landing area toward the LSO observation platform. After three attempts to park and several fouled-deck waveoffs by the LSO, the air boss directed the handler to move the aircraft to the starboard shelf just aft of elevator 3.

As the tow-tractor pulled the aircraft across the landing area again, the brake-rider noticed an increase in speed and motioned to the director to slow down. The director didn't see the signal and continued to direct the aircraft aft. He signaled the driver to turn left, with the nose of 621 heading for the scupper on the edge of the flight deck.

During the turn, the brake-rider believed the aircraft was too heavy and was going too fast to make the turn. He thought the nose gear would hit the deck edge, so he applied easy pressure to the brakes to slow the Prowler's forward momentum. After a few seconds, the brake-rider realized the aircraft wasn't slowing fast enough; his only option was to use the parking brake. This locked the brakes and brought the aircraft and the tow-tractor to a noisy stop.

When the smoke from the mainmounts cleared, the nose of 621 was less than a foot from the scupper drain. The tow bar had a 25-degree bend 2 feet from the attaching point, but everybody and the aircraft were safe.

Thanks to his training and experience, the brake-rider recognized a hazardous situation and knew how to correct it. By using the parking brake, he prevented the possible loss of an aircraft and kept at least two people from getting hurt—himself and the tractor driver. That brake-rider is a versatile mech: He's a qualified plane captain, a final checker, a dual work-center CDI, and he's flight-deck qualified. He is currently the egress/environmental work center's LPO (lead petty officer).

Take pride in being qualified to do more than work in your specialty; you never know when you'll need it to prevent an accident. ✈

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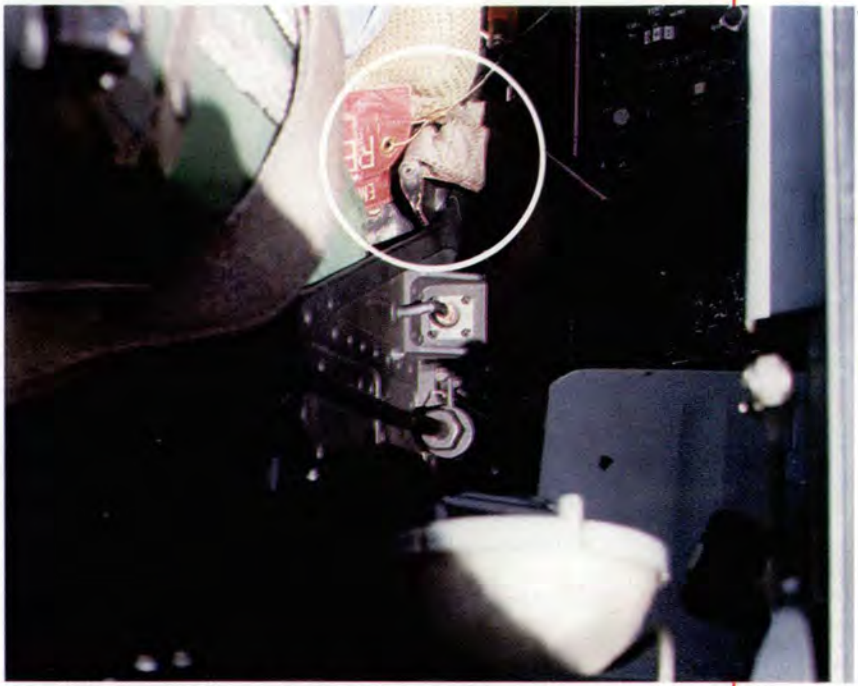
You Gotta Watch the Details

ATCS(AW) WILLIAM SCHLITZ
Courtesy *Mech*, Jan-Feb 96

During high-tempo ops that included a missilex, we towed one of our aircraft to the missile-loading area to hang some live ordnance as quickly as possible. We had worked long hours and were a tired crew.

Our plane captain started his preflight on the cockpit when he noticed that the lap-belt koch fitting for the front ejection seat had wedged itself between the console bulkhead and the ejection-seat guillotine linkage. He immediately called an AME (aviation survival systems mechanic) CDI (collateral duty inspector), who told us the aircraft was down for an unsafe condition.

We determined the lap belt had probably fallen down when the seat was all the way down. When someone raised the seat, the lap belt became wedged between the bulkhead and the ejection seat. We lost use of an aircraft for the better part of the day while we pulled the seat and replaced the guillotine linkage. We may have been able to avoid this problem with a little common sense. ✈



(Above) The lap belt is caught between the bulkhead and ejection seat.

(Left) The ejection-seat guillotine linkage was bent when someone forced the seat up while the lap belt was wedged between the seat and the bulkhead.

Seasons Greetings

...From the staff of Flying Safety Magazine and the Air Force Safety Center. We wish every Air Force member and their families a prosperous and SAFE new year.