flying

SAFETY

OCTOBER 1986

What Next?

The Great Bird Detectives

The Chiefs of Flying Safety

MIDAIR

A New Approach

■ *Flying Safety* magazine is changing again. We are expanding our coverage to include all areas affecting flight safety. This includes maintenance, flight medicine, aviation physiology, etc. This change was necessitated by the cancellation of *Maintenance* magazine and the *Air Force Safety Journal*. Our name won't change, only the coverage. *Flying Safety Maintenance Journal* is a bit cumbersome for a title, so we'll remain *Flying Safety* magazine.

Since we can't add any more pages to the magazine, we won't be able to give full coverage to all areas. We will try our best to give a fair shake to all. Rest assured we will continue to provide the quality safety articles you expect from *Flying Safety* magazine.

New monthly features include Tech Topics and the FSO's Corner. We will also have a quarterly feature for flight surgeons and aviation physiologists. Except for these regular features, the magazine won't be divided into sections. The amount of coverage of the different areas will be based on such factors as relative importance, timeliness, and quality of inputs.

Welcome to our new readers! To all our readers, please bear with us during our transition period. As always, we welcome your inputs. Let us know what you think of the new *Flying Safety* magazine and what you think could be improved. Also, send us articles you have written, ideas for articles, or interesting photos.

I think you will enjoy seeing what some other people in related areas are doing. Reading about these other fields can really improve your perspective of the whole scheme of flying safety. (You thought I was going to say the "Big Picture," didn't you?)

Be Safe! ■

Jimmie D. Martin

JIMMIE D. MARTIN, Lt Col, USAF
Editor

UNITED STATES AIR FORCE

flying

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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What Next?

LT COL JIMMIE D. MARTIN
Editor

■ Have you ever had one of those days when nothing seemed to go right? A day when you were afraid to say "It can't get any worse" for fear it would? I thought so — just about everyone has. I'm sure you can relate to the following true story about an F-4 crew enduring such a day. I'll call them Snakebit 2.

The crew took off as No. 2 of a 12-ship strike package on an ORI mission. In addition to the 12-ship strike package, there was also a 4-ship escort flight plus 2 IG chase aircraft and 3 aggressor aircraft. The mission included air refueling, reacting to enemy threats, and low altitude tactical weapons delivery.

Everything was normal until the mishap F-4 approached the IP. At that time, the crew noticed the gear and flap indicators in both cockpits indicated unsafe (barber pole). The problem was quickly analyzed as an indicator malfunction, and the flight continued onto the range. The flight was unable to positively identify the target and aborted the weapons delivery attempt.

As they were returning to the IP for a reattack, Snakebit 2 called joker fuel. At the IP, Snakebit 2 called bingo fuel. (Both joker and bingo fuel had been set abnormally high because of single runway operations at the deployed recovery base, suita-

Have you ever felt Rodney Dangerfield's "I don't get no respect" applied to you? It seemed to fit this F-4 crew at the time.

bility of alternates, and the number of aircraft airborne at one time.) At this time, the flight lead told Snakebit 2 to depart the flight for the recovery base.

When Snakebit 2 reached the control zone and checked in with approach control, he was told to hold northwest of the field. While holding at 3,000 to 4,000 feet, the pilot decided to lower the gear and flaps to see if he had good cockpit indications. The indicators still showed unsafe, and the pilot contacted the SOF for assistance. After confirming checklist accomplishment with the SOF, the crew returned to approach control frequency to get a chase aircraft and raised the gear and flaps.

Snakebit 2 then found the approach control frequency was swamped due to all the returning aircraft. The pilot was finally able to get through on the radio and declared an emergency. As Snakebit 1 was rejoining on 2 to act as chase aircraft, they heard on the radio that an aircraft had crashed on the runway and the field was closed.

With 2,000 pounds of fuel remaining (minimum fuel), Snakebit 2 requested vectors for the flight to their alternate. Since the alternate was only 10 miles away, the flight decided to remain at 3,000 feet and 250 knots (normal GCA vectoring airspeed). The flight was soon on radar downwind. As Snakebit 2 was about to turn base with 1,500 pounds of fuel (emergency fuel), the crew was advised the runway was closed due to an aircraft with blown tires and structural damage. This was only 6 minutes after the runway closure at their first recovery base.

Now things were getting tight. After 2 minutes of trying to get through on the congested approach control frequency, the flight finally received general vectors to another alternate about 30 miles away. Snakebit 2 was now down to 1,000 pounds of fuel. This diversion was complicated by several factors. The radio frequencies were very congested as both military and civilian aircraft were requesting clearances and vectors. The civilian field Snakebit was going to had no navigation aids, so they had to rely on radar vectors. Approach control let the flight fly a roundabout course to the field rather than a straight line. A haze layer made it difficult to locate the field visually. Oh, yes, one more thing — it was night.

After about 10 minutes, Snakebit 2 was finally brought to a close in base followed by a steep final. At about one mile out on final, the WSO noticed the RPM fluctuating on both engines. Fifteen seconds before touchdown, the right engine flamed out. The left engine flamed out at or near touchdown.

After two runway closures, two diverts, and a lot of communication problems, they were finally safely back on the ground. But, it wasn't over yet.

The pilot deployed the drag chute and told the WSO to activate the emergency brakes. Since both engines had flamed out and the antiskid system was not available, the pilot used minimum braking to slow the now quiet Phantom down until just prior to a taxiway near the end of the runway. The pilot decided to try and clear the runway so his leader could land since lead was also low on fuel, and there were no other divert fields available.

With the nosewheel steering inoperative, Snakebit 2 used the left brake to turn onto a taxiway which branched off the runway at about a 60 degree angle. Sometime during the turn, the left tire blew out and the pilot lost directional control. The F-4 left the taxiway at a slow speed and came to a stop in the infield. The flight lead landed safely.

The next day, both wheels and tires were replaced and the aircraft was flown home. What caused the gear and flap problem, you ask? Oh, that was a popped circuit breaker in the rear cockpit.

Before you start making derogatory comments about the WSO, let's look at some facts. The WSO looked for popped circuit breakers and didn't see any. But, this circuit breaker is located where it is virtually impossible to see if it is popped, and it must be checked by feel. I'm sure you're saying "If he had really checked the breakers like he should have, the rest of the problems wouldn't have happened."

Maybe not, but consider this. If they had found the popped circuit breaker when the problem first happened, they wouldn't have returned early. Their normal recovery would have put them in the pattern at about the same time with the same amount of fuel, or maybe less.

The series of runway closures and diverts had nothing to do with the original problem. It was a very unusual series of events, and the crew had no reason to expect them to happen. We could sit back and Monday-morning quarterback this one to death. We could go through a lot of "what ifs." The odds of both fields closing are pretty remote. But, it happened, and we almost lost an aircraft as a result.

I think the important thing to learn from this mishap is this: Never take anything for granted. Some strange things happen when you're flying airplanes, and we should try to anticipate the unexpected and have a plan of action. Don't say it can't happen. Also, don't hesitate to declare an emergency. If the primary radio frequency is so congested you can't even talk, use guard channel to get some help.

Anticipation, preplanning, and decisive action can turn the tide. A day in which nothing is going right can be changed to one which is going your way. Don't be a victim of circumstances — be a victor over circumstances. ■

The Great Bird Detectives

CAPTAIN THOMAS A. FARRIER
89th Military Airlift Wing
Andrews AFB, DC

■ The crew was halfway through a routine cross-country return when it happened: *Crack!* The whole aircraft was jolted by a tremendous impact on the copilot's windshield! The crew began an immediate descent, staring back and forth between the smashed outer pane of glass and the altimeter in disbelief — a *bird strike* at FL 430?

The safety staff roared into action before the aircraft had even made its uneventful landing back at home station. A crowd of interested parties was on hand to greet the arriving aircraft, and to pay their respects to the intrepid bird that had somehow made its way to 43,000 feet (most likely without supplemental oxygen). The evidence was plain to see: The remains of the outer windshield were pushed inward, with the exact point of impact obvious from the cracks radiating out from it, and with a rather disreputable smear being the only organic remains of the feathered missile.

It was late in the evening when the aircraft landed, and the few artificial lights scattered along the flightline made it difficult to see the rest of the airframe clearly. The aircraft was towed into a hangar, pictures were taken, and quality assurance began a careful survey of the entire plane which lasted into the small hours of the morning.

Early the next day, the quality assurance inspector reported there were traces of blood on the No. 2 engine inlet (copilot's side). That clinched it: A new record altitude for a bird strike had been set, shattering the previous mark by more than 5,000 feet! Excited calls to the Bird/Aircraft Strike Hazard (BASH) Team at Tyndall AFB, Florida, were met with skeptical enthusiasm — the pros had their doubts, but definitely wanted to work with the windshield in hopes of retrieving some of the trace remains that were still spread all over it.

The dreams of a Guiness' entry evaporated late in the day. The chief of quality assurance called the flight safety office with the disappointing (not to mention embarrassing!) news that the windshield seemed to have been the victim of a failure of the anti-ice strip, rather than having been struck by a record-setting fowl. A red-faced, hasty reassessment of the facts and testimony was initiated. The following are a few investigative tips, offered in the spirit of helping other safety people avoid similar subtle traps.

■ **If it feels wrong, it might be wrong.** Logic argued against having encountered a bird anywhere near the altitude where this incident took place. The crews' insistence there had been an "impact," along with the (apparent) physical evidence spread all over the windshield, led the investigators to accept the improbable.

■ **Listen to what your witnesses**

are saying. The flight mechanic's testimony contained an interesting observation: "About a second before it hit, I saw a flash." What he saw most likely was arcing of the windshield's anti-icing strip, which weakened the outer pane of the windshield enough for the windblast (at .83 Mach) to do the rest of the damage.

■ **Use all of your senses, and use them where they're effective.** The first investigator on the scene had run across bird strikes before. He knew they smell bad. Having not had dinner, he didn't want to take a big whiff on an empty stomach, so he kept a respectful distance during his initial observations. By not getting close enough to pick up even a trace of that characteristic fragrance, he denied himself an important clue. In addition, the ambient light was almost nil, and maintenance people were hot to get the airplane fixed and back on the line. A cursory look-see made under weak artificial light with tired eyes runs a poor second to a detailed inspection with magnification, preferably made under strong natural light by a well-rested investigator.

■ **Don't jump to conclusions.** This is stating the obvious . . . or is it? This message is taught in detail at safety school, but it's a lesson that can be quickly forgotten under time pressures, self-imposed or otherwise. In this case, a damaging bird strike apparently had been experienced. AFR 127-4, Investigating and Reporting US Air Force Mishaps, has a reasonable timetable for submission of preliminary reports of Class C mishaps.

The trouble is, the destruction of a windshield alone was a "single-system" failure. As such, it wasn't reportable under Class C criteria. The safety staff decided it was such an extraordinary event it needed to be reported upchannel somehow. The vehicle of choice became a HAP message, with its accompanying shorter suspense. The desire to "get the word out fast," coupled with the brief time the aircraft could be left in its original damaged condition, led to a too-fast judgment of the "cause."

Remember, "preliminary" reports are just that — *preliminary.* It may be hard to preserve evidence as long as long as you'd like, but an intelligent strategy of picture- and statement-taking can do wonders toward remarkably accurate reconstructions of the sequence of events.

As a matter of general interest, the windshield failure *did* show several symptoms of having undergone a bird strike. A number of dramatic color pictures are available, any one of which could easily support such a theory. What actually happened is far more subtle:

■ The windshield was weakened by local melting at a "hot spot" created by the windshield heat tape malfunctioning.

■ The weakened spot collapsed suddenly under aerodynamic loading. The failure caused cracks to propagate outward from the original damage, creating the same kind of fan-shaped pattern customarily associated with impact.

■ The plastic of the outer windshield continued to be heated by the faulty strip (which did *not* pop its circuit breaker). Melted and discolored, the plastic flowed away from the source of the heat along the fresh cracks, leaving "feathered edges" in the slip-stream.

With the appropriate apologies, it must be noted this is definitely a question of whether the chicken came first! The windshield heat damage was assumed to be the result of the "impact," rather than the start of the mishap sequence. That false start, supported by all of the other circumstantial evidence, led to a logical (but completely wrong) theory of what happened. *Caveat Lector* (let the reader beware)!

It goes without saying that this crew could have had a very unpleasant evening if the inner windshield had not held. A windshield failure of *any* type at high altitudes and high true airspeeds can ruin your day, regardless of what causes it. If an aircraft comes back with bird strike damage, make sure you consider all of the alternatives before blaming it on a "phantom flier!"

(Oh, yes — those of you who were paying attention may recall a reference to blood found in the No. 2 engine inlet. The blood was there, and it really *was* blood. From a red herring, perhaps? Who knows . . . ?) ■

These photos clearly show how misleading physical evidence can be. This is especially true if you've already reached a tentative conclusion and are looking for evidence to support it.

CHIEFS OF FLYING SAFETY

LT COL PAUL F. HENRY
Commander
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Seymour Johnson AFB, NC
with input from
CAPT JOSEPH A. LANNI
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■ On 20 November 1985, the 335th Tactical Fighter Squadron's "Chiefs" made safety history, becoming the first fighter unit to surpass 110,000 flying hours without a Class A mishap. Perhaps similar records exist outside the tactical fighter arena, but for people who fly with guns and bombs, often at very low altitude and high speed or "turn and burn" against air-to-air adversaries, this record is a special one indeed.

The march to the 110,000-hour benchmark began on 2 October 1969, nearly 17 years ago; and since

The History Of The Chiefs

JAY BARBER
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■ The 335th Tactical Fighter Squadron is one of the Air Force's most distinguished units. Like its sister squadrons, the 334th and the 336th, the 335th traces its lineage to Great Britian's Royal Air Force.

Before the United States' entry into World War II, American volunteers were already serving as combat veterans in Royal Air Force Squadrons 71, 121, and 133. When the United States entered the war, these units, and the American pilots in them, were transferred to the US Army Air Forces, forming the 4th Fighter Group which became the genesis of Europe's mightiest air armada, the 8th Air Force. Royal Air Force Squadron 121 became the 335th Tactical Fighter Squadron.

The 335th was credited with destroying 262 aircraft during World War II — 165 in the air and 97 on the ground. The squadron produced 10 aces.

During the Korean Conflict, the Chiefs destroyed 218.5 enemy aircraft, becoming the world's leading MiG killers and added 12 more aces to its rolls.

that time, it has taken the concentration and cooperation of hundreds of professional airplane drivers and airplane fixers to keep the Chiefs' incredible string intact.

You might say there's a certain burden associated with maintaining this outstanding record, and there is. It is like a pilot or weapon systems officer having a reputation for good performance on the bombing range and then having to live up to that "Top Gun" image every time he flies.

There's definitely an incentive to maintain the squadron's safety momentum — nobody in operations or maintenance wants to be the person responsible for breaking the spell which has sustained the record through tough times, including combat in Southeast Asia and the tactically demanding flying done at

continued

Maj Ed Kroboth, a 335th Tactical Fighter Squadron pilot, knows his personal equipment has been as carefully prepared for this flight as he has. (Photo by Amn John Stricklin)

The 335th Chiefs came to Seymour Johnson AFB, North Carolina, with the 4th Wing in December 1957 and have continued to serve the Nation with distinction.

Since their incredible safety record began in October 1969, the Chiefs have participated in hundreds of exercises, inspections, and deployments which have taken them to all parts of the United States, Canada, Asia, and Europe.

The Chiefs operated out of Kunsan AB, Korea, from December 1969 to June 1970. In July 1972, they deployed to Ubon Royal Thai AB, Thailand, for 6 months, flying more than 1,700 missions in support of the war in Southeast Asia.

The 335th deployed to Spangdahlem AB, West Germany, in July 1975. This was the first of a series of tactical deployments to improve Tactical Air Command's capability to respond to European contingencies. The Chiefs deployed to Lahr AB, a Canadian base in Lahr, West Germany, in 1977, in an exercise designed to familiarize TAC air and ground crews with the unique aspects of air operations in Europe.

The squadron assumed a dual-based mission with Ramstein AB, West Germany, and deployed there in 1978, 1979, and 1980. The unit deployed to Karup AS, Denmark, in support of Coronet Musket in 1982 and in 1985, became the first American fighter squadron to deploy to Wittmundhaven, a West German air base.

Lt Col Paul F. Henry, 335th Tactical Fighter Squadron commander, preflights an F-4E as he prepares to add another record-setting mission to the total. (Photo by A1C Scott A. Blackhall)

Today, the 335th is a "front line" operational unit, ready to respond to crisis situations anywhere in the world on a moment's notice.

Although 335th aircrews are trained to deliver a variety of conventional weapons, their special capability is the GBU-15 glide bomb. The squadron is virtually "writing the book" on the employment of the electro-optical GBU-15, a heavyweight standoff bomb that can be delivered with pinpoint accuracy.

In 1983, aircrews of the 335th began upgrade training in this system, and in November 1983, the Chiefs became the first Air Force operational squadron to achieve combat-ready qualification with this unique munition. The Chiefs also conducted the first operational launch of the GBU-15 under realistic combat conditions while participating in Red Flag in January 1985 at Nellis AFB, Nevada.

The Chiefs have a long and distinguished history. But, it doesn't stop here. They are adding new achievements with each passing day. ■

home and on deployment for so many years. While pressure is a fact of life in sustaining this achievement, the 110,000-hour mark creates a special safety awareness among the jet jockeys and the wrench turners which is unique to the unit.

People don't talk about it all that much or brag about it to folks in other squadrons, but they don't forget it either. The knowledge that you're playing a part in something important is there, and it influences how you approach day-to-day business, whether it's making an engine change, troubleshooting an electrical problem, or leading a six-ship cell across the pond.

The awareness of that safety clock continuously ticking in the back of your mind reinforces a lot of good habits, a healthy conservatism if you will. Maybe that engine change won't be just routine this time even though you've gone through those familiar motions so often; you can't seem to duplicate that electrical malfunction, but you'll try one more time; you know wing stan/eval spun those fuel numbers but you'll check them personally just in case.

The almost subconscious effect of the big 110,00 in the sky makes people skeptical of easy answers and suspicious of the quick fix. They aren't content with the superficial but rather insist on an extra margin of thoroughness. After all, they reason, "It's not going to be me that puts the jinx on this safety record and louses up what hundreds of other Chiefs before me have achieved . . . no way!"

From the crew dog's eyeview, one point about the squadron's safety record comes through loud and clear: Doing it tactically sound and doing it safely are not mutually exclusive possibilities. Like everyone else in the fighter business, the Chiefs have enjoyed the quantum improvements in readiness which realistic training can bring.

The squadron has had a generous share of the "biggies" like Red Flag and Maple Flag, as well as the lesser known but equally tough stateside composite force training exercises, Inspector General support trips, and middle-of-the-night mobilizations and operational readiness inspections. There have been plenty of overseas jaunts too, yet the "train like you're going to fight" phenomenon, while implying greater risk, has not automatically created what some may view as the obligatory smoking holes which accompany hard-nosed combat training.

To go along with the inherently challenging kind of flying done by combat coded units like the 335th, the amount of flying has pretty much gone off the chart compared to the old days when the squadron was posting say the 10,000 or 50,000 safe flying hour marks. The utilization rate now routinely being sustained on the F-4E airframe would have been the punch line of a cocktail party gag 10 years ago.

So the 110,000-hour figure takes on a whole new significance for aircrews when you consider the intensity of the tactical environment and the frequency of exposure to it are both way up. Realistic, productive training can be done safely — that is the signal the 335th Tactical Fighter Squadron is sending.

It would be foolish not to acknowledge there has been a measure of luck involved in bringing the

As SSgt Tommy Miller goes through prelaunch procedures, he knows he and his coworkers in maintenance have done their best. His F-4E is fully prepared for another successful mission. (Photo by Amn John Stricklin)

Capt Michael D. Hynek, weapons systems officer with the 335 TFS, performs a thorough armament check during the aircraft preflight. He makes sure nothing is left to chance. (Photo by Amn John Stricklin)

WHEN DID IT HAPPEN?

335th Tactical Fighter Squadron's Record

Hours	Date
10,000	December 1970
20,000	June 1972
30,000	July 1973
40,000	May 1975
50,000	January 1977
60,000	July 1978
70,000	January 1980
80,000	September 1981
90,000	February 1983
100,000	June 1984
110,000	November 1985

Chiefs to where they are today — beyond 110,00 hours and still counting. The Gods have no doubt smiled from time to time, turning a potential disaster into what becomes merely a good war story for the lounge or a barbed entry in the "douffer" book.

But luck, as somebody once said, is the point where preparation and opportunity meet. Without constant emphasis by the unit leadership and professional performance by aviators and support people for more than 16 years, the Chiefs would be just another fighter squadron with a good but undistinguished safety record.

What has made the difference is not the quality of the people — there are good ones, even exceptional ones everywhere you look — but that added dimension of "awareness." It's at work from the oldest old head to the newest new guy, from the senior lieutenant colonel to the junior airman. The 110,000 mishap-free flying hour mark is a living record which the 335th's operations and maintenance team nurtures every time a sortie gets in the air, and their goal is not to reach any magic number so much as it is to keep the string going and going and going . . . ■

Editor's Note: on 5 Sep 1986, the 335th's string came to an end when they experienced an F-4 mishap. The squadron's record stands at 115,874 mishap-free hours — an outstanding achievement. Now they're working on beating that record.

Well before the sun comes up, a 335 TFW crew chief readies his F-4E for another day of flying. Hours later, en route to Florida on a GBU-15 training mission, the Phantom is refueled by a KC-10 from the 68th Air Refueling Group at Seymour Johnson. (Photo by Jay Barber & SSgt Pete Wright)

IFC APPROACH

By the USAF Instrument Flight Center, Randolph AFB, TX 78150-5001

You Can't Get There From Here

MAJOR DAVE PERRY

■ You're probably familiar with the old story about the city-slicker tourist who stopped to ask directions from a farmer. The farmer thought it over and said, "You cain't get there from here." Whereupon the tourist snapped, "You don't know much, do you?" "Mebbe not," drawled the farmer, "but I ain't lost."

Filing an airways flight plan can be just as frustrating. You know where you are and where you want to go but you need a Triple A Triptick to find your way between. The shortest distance between two points ought to be a straight line. However, traditional flying being what it is, aircrews are bound by two things: The need to fly either toward or away from a ground based navigation aid, and the need to stay on established airways (routes between NAVAIDS). Quite often, these airways are not conveniently aligned with the shortest (time or distance) route of flight and require extra time and fuel to follow.

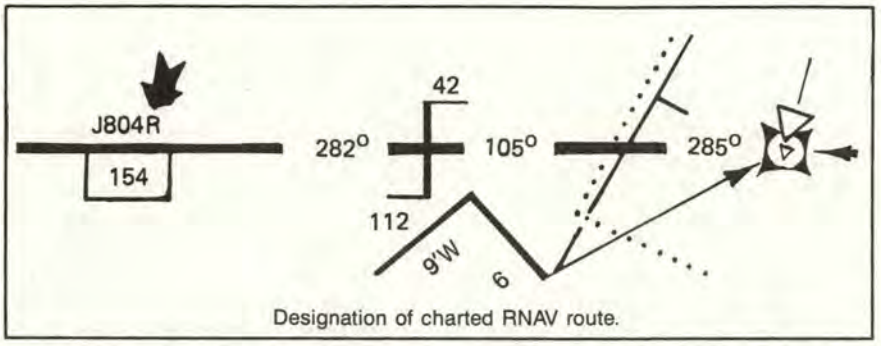
Enter RNAV. RNAV is short for area navigation. There are two types of RNAV, charted and random. Charted RNAV routes exist between published waypoints not co-located with ground based facilities, or facilities too far apart to provide positive, continuous course guidance. In the 70s, there was a system of charted RNAV routes in the United States. The system was ultimately discontinued due to lack of use. The Alaska high charts (see figure) depict the remnants of this system; the routes are shown with the suffix "R."

The other type of RNAV is what this article is about . . . random RNAV. A random RNAV route is created when the aircrew defines one on a flight plan or requests one en route. Within the confines of a few simple rules, random RNAV can be the most direct and/or the shortest route, regardless of the placement of navigation facilities.

Two relatively recent developments have eased the rules which restricted aircraft to flight between navigation facilities. First, computer navigation systems (with inertial, TACAN, VOR, LORAN, or other positioning sensors) give the aircrew a true area navigation capability. Routes can now be defined by latitude/longitude or radial/DME waypoints with the navigation computer displaying a continuous position relative to the great circle course between waypoints. Secondly, stateside radar coverage gives ATC controllers the ability to continuously monitor aircraft progress throughout an entire flight.

Renewed USAF interest in random area navigation stems from the results of Operation Free Flight, a 1980 FAA test of the viability of a random RNAV system for commercial aviation. Of special interest was the impact on pilots, controllers, and fuel consumption. Data was collected for flights between 27 city-pairs by 4 major airlines. The results were encouraging. Almost 80 percent of the flights saved fuel, based on comparisons to non-RNAV fuel consumption. Those flights which did not save fuel usually blamed weather diversions or inaccurately forecast upper level winds. Fuel savings amounted to an average 2 percent of estimated en route fuel.

The FAA determined there was no adverse controller impact. Although random RNAV traffic was handled differently, system conflicts



Designation of charted RNAV route.

were reduced. FAA officials stated, "Having all traffic along established routes may provide uniformity but adds to the potential for overtakes and head-on situations while reducing some of the flexibility for pilot discretion descents. All in all, potential en route airspace conflicts appear to lessen in most cases of direct routing."

The results indicated area navigation was the way to go, especially for a fleet of large aircraft. The problem was to routinely perform area navigation, aircraft equipment had to be certified in accordance with an FAA directive that set very high course tolerance standards.

During Operation Free Flight, the FAA re-evaluated certification requirements for RNAV aircraft. Because radar controllers must provide radar separation service to RNAV traffic, course tolerance (although important) is not as critical as for airways traffic. The FAA concluded there should be new equipment suffix codes "to identify aircraft with *any* type of area navigation capability, regardless of the method of certification."

Within the USAF, specific aircraft RNAV certification is done by the major command. Guidance for filing and flying RNAV is contained in FLIP General Planning (GP). Essentially, you may designate an Area Nav Suffix to the transponder code if your aircraft has a computer or combination of computer and TACAN/VOR systems which can:

a. Display random courses, based on coordinates or radial/distance from a point of origin to a clearance limit.

b. Provide the pilot with a continuously updated aircraft position with reference to the selected course.

c. Allow adherence to the existing federal airway/jet route structure.

Paragraphs a and b are basically the definition of an RNAV computer. Paragraph c requires further explanation.

For an RNAV flight to take place in the CONUS, it must be radar monitored (lack of constant radar monitor is the reason for limited random RNAV in Alaska). If, for any reason, radar coverage is no longer available or if the controller cannot provide the radar monitor, aircraft must immediately return to the published VOR/TACAN airways. If the RNAW equipment is certified accurately enough to allow adherence to these routes, it is all you need. If the equipment cannot adhere to airway route tolerances, you need a TACAN/VOR navigation system.

aircraft authorized for *en route* area navigation. En route meaning departure fix to IAF. USAF aircraft are not authorized to fly RNAV approaches.

C-5	WC-135
C-9A/C	VC-137
C-12F	KC-10
C-20	E-3A
C-21	F-15
C-22	F-16A/C
C-23	F/RF-4 (ARN-101)
C-130 w/NAV	FB-111 (AGN-16)
C-135	FB-111 (ASN-141)
C-141	B-52 (APN-89)
KC-135	B-52 (ASN-36)
VC-135	

So, there you are in Base Ops filing a flight plan. What can RNAV do for you? If you file to cruise at FL 390 or above, you have the simplest option of all available. The first point in the route section is the published fix from which you intend to begin the random route and climb to 390. The second, and last required fix, is the published fix *and* latitude/longitude from which you intend to begin an approach to the destination airfield (i.e., an IAF). It is important for your first and last fixes to smoothly transition you to and from the local traffic area.

If you don't routinely operate at FL 390 or above, you can still file RNAV by adhering to two simple rules.

- You must file at least one waypoint in each ARTCC over which the random portion of flight will be conducted. Such waypoints must be located within 200 NM of the preceding ARTCC's boundary.
- All random route waypoints must be published fixes or fixes described by a radial/DME plot (i.e., no latitude/longitude fix descriptions).

The easiest way to plan a route is to use the high chart and lay out a direct route from departure to destination with a string or straightedge and pick out convenient published fixes to fly over. About seven fixes should take you coast to coast. If you have the time and inclination, you could plot out radial/DME fixes which would give you a perfect great circle route, coast to coast. Consult FLIP GP Chapter 4 for complete guidance.

Now you are ready to file your flight plan and go direct to destination, right? Wrong. The shortest air time between two points may not be a straight line. If the direct RNAV route causes you to lose a big tail wind or gain a big head wind, you may be in for trouble, especially if you based your fuel on the ragged edge of the extended range chart or the computer flight plan. A quick look at the appropriate wind chart would definitely be in order. Random RNAV is a powerful, flexible planning tool which produces a route that is not only simpler, but shorter and cheaper. Routine use of RNAV not only benefits you, but exercises the ATC system. The more you use RNAV, the better the chance that next time you will be able to get there from here — direct. ■

MAJOR RICHARD E. BEARD, Jr.
Directorate of Aerospace Safety

When this article first crossed my desk, I rejected it as being unsuitble for our magazine because it didn't say anything about safety. Then, I reread it and found it really gives the basic foundation for safe operations even though the word "safety" is not used. — Ed.

It Isn't Easy

■ Those of us in the United States Air Force take great pride in being the *best* around. While it is often the pilots who get the limelight, anyone who works with our complex systems (missiles, sensors, aircraft, or whatever) knows it is a team effort, and each member of that team must be a professional. Whether officer or enlisted; maintenance, admin, or crewmember; young or old; you are all military professionals.

While being called a "professional" has a nice ring to it and sometimes includes a few true "bene's," it also carries some heavyweight responsibilities. Certain standards of conduct are expected from the true professional, and the professional *always* does professional-quality work.

Often in our society, the professional athlete is characterized as the epitome of the professional. During the recent NBA Championship, one athlete definitely measured up to the standard of a professional, and we should learn from his example.

Larry Bird of the Boston Celtics entered the 1986 championship with his best yearly performance yet. He was selected the Most Valuable Player of the NBA for the third time and is universally considered one of the best players ever. He knew he was good and so did everyone else.

About now, you are probably wondering what Larry Bird and the NBA playoffs have to do with being a professional in the Air Force? Well, did you happen to notice what Larry Bird was doing before each game? He wasn't in front of the press saying how good he was or bad the opponents were. He was practicing. Not just a half-hearted effort but a long, full-blown shooting drill. Here we had one of the best shooters in NBA history doing what the rookie does, out shooting hoops for several hours. Practicing what he does and doing it until he got it right.

The moral of this story: The next time, and everytime, you go to do that job for the Air Force, whatever it is, do it the best you can and, besides that, do it right. The lives of us all depend on it.

It isn't always easy, but nobody said being a professional was going to be easy. ■

MIDAIR

SQN LDR A.G. BRIDGES, RAAF
Directorate of Aerospace Safety

" . . . it will be seen that in the UK the average distance a passenger may travel before being killed is about equal to twice the distance of the earth from the sun."

Railway Passenger Travel, Sep 1888

■ Almost a century later, there is nothing new under the sun. Today, the airplane has largely usurped the train as a passenger carrier, but passengers, nevertheless, remain singularly interested in not being killed; and the crews who fly these airplanes, military or civilian, have the same interest in life. Or do they?

One aspect of airplane operations which often shows a woeful disregard for basic airmanship and commonsense is the midair and near midair collisions. In 1985, 777 near midairs and 24 midairs were reported in the United States. (The FAA classifies a near midair when airplane separation is less than 500 feet.) A remarkable number of these incidents occurred in visual meteorological conditions (VMC), although often hazy and partially obscured.

There were no collisions involving air carriers in 1985, but this year the DC-9 and Piper Archer in Cerritos, California, claimed 67 lives.* The 1956 Super Constellation and DC-7 midair took 128 lives; in 1960, 134 died when a Super Constellation and a DC-8 came together; and 144 died in the 1978 midair between a DC-9 and Cessna 172.

It is in the "little" airplanes, operating under less stringent controls, where people are dying. In this area, it becomes almost exclusively the pilot in command disregarding basic airmanship who must accept the blame. Perhaps a few "real life" reports from the last couple of years will illustrate the point.

*This does not include the people who were killed on the ground as at the time of this writing, that total was not available.

Hazy conditions demand a good lookout. Under these conditions, most of your time should be spent looking outside the cockpit. Two Lears going into two airfields within a few miles of each other almost had a coming together. Both Lears were on the same radio frequency, both were erroneously cleared to the same level, and one was then given traffic advisory on the other. Not liking the situation, one Lear pilot turned left, commenced a climb, and then saw the other Lear so close to him he could read its tail number.

The sun can present similar problems to haze. Two military airplanes were carrying out a practice air intercept when one airplane flew into the other, destroying both airplanes and killing two crewmembers. One airplane had approached from below so that the top airplane stayed in a constant relative position with the sun behind it. Fighter pilots learned as early as the First

continued

MIDAIR

continued

World War to look for threats in the sun to stay alive. This is still important today to avoid being hit by an airplane whose pilot is not looking out.

Under poor visibility conditions, lookout is paramount. If radar has you, request radar vectors clear of conflicting traffic, but continue your lookout. Without radar to help, be aware of all that is going on around you; listen to the radios; know your position; and use a good lookout, even employing the aid of others in your airplane. Passengers can see areas you can't see; use them; you'll probably make their day.

Getting traffic advisories while you are under radar control is certainly nice, but be wary. A Beech King Air was in a climbing turn after takeoff when it missed a Cessna Centurion by 100 feet. The Beech was under radar control. The Cessna was probably operating legally under visual flight rules (VFR) but it was never picked up on radar and could not be traced after the incident. At a different airfield, the same act was performed — the actors being an IFR Lear and a VFR Cessna 172. This time, the separation was established at 50 feet. A VFR Cessna was hit from the rear by an IFR military F-4 in clouds; the F-4 crew did not realize they had hit another airplane, but the Cessna occupants all died.

So, don't feel good about being on radar, and if you are VFR in a "lighty," remember to use transponders and radios, and look out. Be aware of your location and proximity to hazardous areas such as airfields, and file a flight plan whenever possible, updating it with regular position reports.

Even with radar up and running and all targets painting, air traffic controllers are not infallible. An example involved a near miss by a Boeing 707 and a Cessna. The Boeing was on climb after takeoff, maintaining 250 knots while below 10,000 feet. However, after passing 10,000 feet, the Boeing airspeed and rate of climb increased significantly. Although the controller then asked the Boeing to maintain 12,000 feet until past the Cessna which was cruising at 13,000 feet, the Boeing reached 13,000 before its climb could be arrested and a descent to 12,000 commenced. Both aircraft were in clouds throughout the incident.

Another Boeing 707 near miss highlights the need to file a flight plan and to have a serviceable radio. The Boeing, while on ILS final in good visibility, took evasive action when the aircraft commander saw a Mooney very close after traffic advisories had been issued. The Mooney pilot was operating VFR but had not filed a flight plan, and he was busy at the time of the inci-

dent trying to fix his radio which had been intermittent for some weeks.

Even if you beat the weather, fickle radar, fallible controllers, or roadhog pilots, there still remains yourself to beat. On a clear day in VMC, a military aircraft descended on top of a Cessna, killing all those in two airplanes. The military aircraft crew, approaching the Cessna from above and behind, could not easily see the Cessna, and the Cessna pilot would have found it difficult to see the other aircraft. The lesson here is to look into the hardest areas to see. When descending, clear under the nose.

Maybe one can understand the last mishap, but what about the midair which killed 17 people when one airplane took off on runway 11 while the other airplane was making an approach to runway 25? The collision occurred in VMC with the departing airplane on an IFR flight plan — not on radar but in radio contact with air traffic control — and the arriving airplane was operating under VFR with no flight plan. The landing pilot had made no radio calls. It appears that at these critical phases of flight, soon after takeoff and on final approach, none of the four pilots were maintaining an adequate lookout.

The skies are so full these days that the defensive driving rule is as applicable to airplanes as it is to automobiles. Assume the rest of us are out there to get you! The key word to avoid midairs is awareness. Be aware of the fallibility of the human being, pilot or air trafficer; be aware of the extent of radar coverage and its fickleness; and be aware of other possible traffic — listen to your radio, read your map looking for airfields and other areas where traffic density increases, and, above all, have as many eyes as possible outside the airplane and looking into the difficult spots.

Apart from lookout, of those incidents we have looked at, perhaps the saddest are those where people were cutting corners. The rules may not require a flight plan or a radio call, but do them anyway. Include flight planning as an integral part of the flight by allowing time for it. And don't go if your radio won't go. For the cost of a radio, you may forfeit your life. Costing safety is always negative; how many died, what property value was destroyed? It is hard to prove that a new radio, for example, saved a life, but it is so easy to prove that a faulty one took a life.

A little preplanning, a little commonsense, and a healthy dose of self-preservation can go a long way to help you avoid a midair. Keep your eyes open, and always expect the other airplane to be exactly where you wouldn't expect it. ■

FSO's CORNER

Midair Collision Avoidance

CAPTAIN DALE T. PIERCE
919th Special Operations Group
Eglin AFB Aux Field 3, Florida

■ Midair Collision Avoidance (MACA) — the term rings out to all who fly. Last year in the Air Force, two people died and four aircraft were lost as a result of midair collisions. Because of this, the need for flight safety programs to include a MACA program would be intuitively obvious even if AFR 127-2* didn't require one.

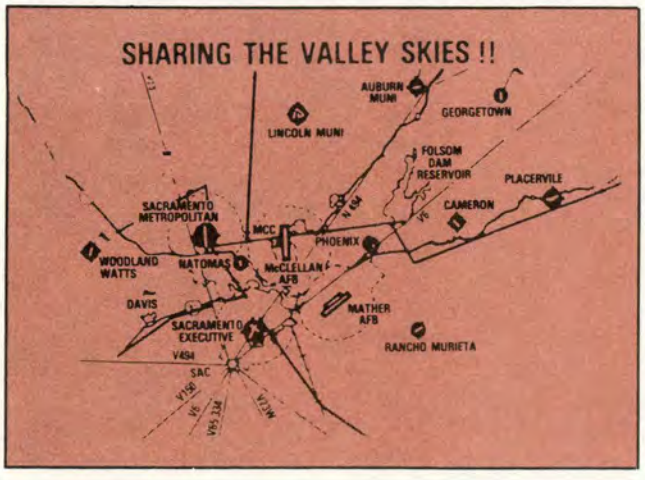
Most MACA programs are educational programs using various mediums to "get the word out."Beyond participation in local MACA committee activities, individual FSOs are free to control the nature and direction of their MACA program. Despite this flexibility, most MACA programs are surprisingly similar. Occasionally, however, a creative twist surfaces. One such twist is the card used by the folks at the Sacramento Air Logistics Center's (SA-ALC) flight safety office. It's shown in the figure.

The side that depicts the numerous airfields in the Sacramento area is similar to cards used at other bases (Eglin AFB, Florida, for instance, uses a 5- by 8-inch card). On the other side is a list of local radio frequencies. The depiction of airfields serves to remind fliers of the midair collision potential around Sacramento. The small size of the card and the radio frequencies serve to encourage individuals to retain the card as a useful and convenient source of information.

Major Larry Dreaden provided this month's FSO's Corner. He's the Chief of Flight Safety for SA-ALC at McClellan AFB, California.

The FSO's Corner needs your ideas. What are you doing in your program that could help other FSOs if they knew about it? Call me (Dale Pierce) at AUTOVON 872-8537, or send your name, AUTOVON number, and a brief description of your program idea to 919 SOG/SEF, Eglin AFB Aux Fld 3, Florida 32542-6005. ■

*The USAF Mishap Prevention Program



COMMON VHF FREQUENCIES

SACRAMENTO APPROACH	124.5/ 123.7/ 119.1
CASTLE APPROACH	121.4/ 126.5/ 124.8
TRAVIS APPROACH	126.6 (N) 119.9 (S)
BEALE TOWER 126.2	MATHER TOWER 126.2
TRAVIS TOWER 120.75	CASTLE TOWER 118.45
McCLELLAN TOWER 124.6	
STAGE III SERVICE	125.6/ 124.5
SACRAMENTO DEPARTURE	127.4

643-5537 McCLELLAN AFB FLIGHT SAFETY

Just A Little Nasal Congestion

MAJOR DAVID H. SUMMERS, M.D., MC FS
19th Air Refueling Wing
Robins AFB, GA

■ We were 18 miles out at 4,000 feet on a practice ILS approach for Runway 32.

The navigator of the KC-135 noticed a mild fullness in his cheekbones — just below his eyes. He tried clearing his ears and pressed on his nose, but it failed to relieve the sensation. As the aircraft descended, the pain worsened — 2,300 feet, 8 miles to go.

"Is it bad enough to abort the approach and go around?" the pilot asked.

The nav looked ahead. The runway was so close, beckoning us on.

"I'll be all right."

Thirty seconds later we were on the ground, but the pain was much worse. An ambulance met the airplane at the ramp and took the navigator to the hospital for treatment.

Routine sinus block?

He told the doctors he had only slight stuffiness that morning. But the x-rays did show sinusitis, and he was grounded for several weeks while he recovered.

Is sinus block routine?

Remember the briefings from the flight surgeons we all slept through? The standard procedures for sinus or ear block are:

- Regain altitude until the symptoms are relieved.
- Use a topical nasal spray (such as Afrin® or Neosynephrine®).
- Attempt a slow descent.

Sinus block is preventable. Relieving the pressure before any damage is done can prevent a lot of pain and avoid a long course of medical treatment. However, there are several traps which can lead one down the primrose path.

First, the ears and nose vent out better than they vent in because the atmospheric air pressure increases at a greater rate at lower altitudes. As a result, there is more air to move into the sinuses in the last thousand feet of descent than there was in the first thousand feet. Therefore, be warned that sinus blocks usually occur during the approach.

Second, if you've never had a sinus block, it's easy to underestimate the amount of pain involved. People often think if there's a mild tinge of pressure at 4,000 feet, surely it will not be so bad at ground level.

Wrong.

In those few seconds of final approach, the pressure change is so much that it can cause excruciating and incapacitating pain. The head feels like it is about to explode. Vision can become blurred or double. Blood vessels inside the sinus sometimes burst, filling the sinus with blood. Hopefully, there's someone else who can handle the controls. In the hospital, heavy doses of pain medications are given to the victim, and recovery can take weeks.

As with so many things in flying, disasters are averted by early intervention when the problems are still small. Follow standard procedures.

Of course, the best solution would be to swallow your pride and stay down when your nose is "a little stuffy." But physiological incidents can creep up and surprise us all.

In the case of the KC-135, a bottle of Afrin was on board. A climb to 6,000 feet and use of the spray would probably have opened the nose enough to get down without any further problems.

Unfortunately, the Dash-1 doesn't mention Emergency Nose Procedures, nor do the prelanding checklists mention sinus headache. But it is just as important for crewmembers to tell the others about their pain and then take quick action to relieve it.

Don't be seduced by the nearness of the runway. ■

Safety Warrior

Are You Prepared To Live For America?

During peacetime, we tend to not think about things such as the Code of Conduct. But, as the recent confrontation with Libya dramatically illustrated, we never know when things may change. As professional warriors, we may be called on to meet a threat. In the process of doing so, we could become a prisoner. With that thought in mind, consider the following article.

SSGT DENISE SMITH
3636th Combat Crew Training Wing
Fairchild AFB, WA

■ The most difficult environment to survive in is captivity. The mental and physical stresses placed on a POW are phenomenal. The mental stresses alone can be overwhelming. Loneliness, loss of self-esteem, insecurities, hatred, and depression are just a few of the many mental stresses a POW may have to contend with. The pressure felt due to these stresses can be increased by physical annoyances. Discomfort and pain can be caused by various physical stresses such as poor treatment, lack of food, insufficient water, sleep deprivation, and inadequate medical care.

For just a moment, try to imagine yourself in the shoes of a serviceman captured in Southeast Asia — a wooden slab with leg irons for a bed, a bucket in the corner for restroom facilities, and occasionally, rice or pumpkin soup for a meal.

As a POW, how do you cope with the numerous stresses forced on you? Where do you find the strength to go on with your life? You can turn to your God and your country for help and guidance. Also, DOD Directive 1300.7 gives servicemen guidance about how to conduct themselves in captivity. As servicemen, we

Code of Conduct

I "I am an American fighting man. I serve in the forces which guard my country and our way of life. I am prepared to give my life in their defense."

II "I will never surrender of my own free will. If in command I will never surrender my men while they still have the means to resist."

III "If I am captured I will continue to resist by all means available. I will make every effort to escape and aid others to escape. I will accept neither parole nor special favors from the enemy."

IV "If I become a Prisoner of War, I will keep faith with my fellow prisoners. I will give no information or take part in any action which might be harmful to my comrades. If I am senior, I will take command. If not, I will obey the lawful orders of those appointed over me and will back them up in every way."

V "When questioned, should I become a Prisoner of War, I am required to give name, rank, service number, and date of birth. I will evade answering further questions to the utmost of my ability. I will make no oral or written statements disloyal to my country and its allies or harmful to their cause."

VI "I will never forget I am an American fighting man, responsible for my actions, and dedicated to the principles which made my country free. I will trust in my God and in the United States of America."

If captured, don't despair. Remember the Code of Conduct and those gallant American prisoners before you who have upheld the Code. You can do it, too, if you're prepared.

also have a more specific moral guide that will help us to sustain our lives if we ever fall into enemy hands — the Code of Conduct. The Code of Conduct gives us direction and helps us to cope with the strains of captivity.

How does the Code of Conduct apply to you? The Code reminds us that we, as servicemen, have duties and obligations in captivity, an obligation to support our superiors and our fellow prisoners, and a duty to uphold the ideals that made America the strong nation she is today. The Code points out that we, regardless of what situation we may find ourselves in, are prepared to go on fighting in any manner necessary for our country. Segments of both the Code of Conduct and the Uniform Code of Military Justice are referred to in the oath of enlistment as well as in the oath of commission. The Code is also a declaration of where our loyalties should lie.

For just one example, an Air Force captain, a navigator in an F-4, spent 61 months in North Vietnam upholding the standards set in the Code of Conduct. During that 61 months, the captain was exposed to numerous interrogation sessions and beatings. Despite the physical and mental coercion he was exposed to, he withheld vital tactical information and research material from his enemy. He and hundreds of other POWs knew where their loyalties belonged.

When you read the Code of Conduct, I hope you'll be reminded of the true patriots who died in captivity or who returned to America with their honor intact. I challenge you to know *your* Code of Conduct and to be prepared to meet your enemy if it becomes necessary. Base and public libraries and intelligence sections can provide you with valuable information about past POW experiences. Use the sources available to you now; *you* may be your only resource in a future situation. Our Code of Conduct reminds us if we are captured, the battle doesn't end . . . it's just beginning. ■

Safety and Organizational Excellence

Have you ever heard anyone say "Don't let safety get involved or you'll never get anything done?" Not true. Safety and operations are compatible. In fact, safety is the foundation for effective operations.

DR TIMOTHY R. KECK
PACAF Staff Historian
Hickam AFB, HI

■ Organizational excellence! The Air Force has devoted a great deal of attention over the past 2 years to this subject, not only in assessing management and command philosophy and practice, but also through participation in the DOD Model Installation Program and related ventures. An emphasis on safety plays an important role in the quest for excellence; indeed it may not be overstating the case to assert that, in the Air Force, excellent organizations seek, attain, and maintain outstanding safety programs.

Flying safety provides an important example. Several major commands compiled exceptional flying safety records in 1985, including the Pacific Air Forces (PACAF), which received the 1985 Secretary of the Air Force Safety Award. PACAF's achievement was quite dramatic. Flying the latest high performance fighter aircraft, PACAF crews flew approximately 95,700 hours on 73,000 sorties without a Class A mishap. This perfect record had never been achieved in PACAF, nor had it been attained by any command of similar size and mission.

PACAF's achievement was indicative of overall Air Force trends, for 1985 was also the safest flying year since statistics on aircraft mishaps were initiated in 1921. In assessing the outstanding record compiled by the Air Force, Lt Gen Robert D. Springer, The Inspector General, credited increased operational flight hours, a higher availability of spare parts for aircraft, a crosstalk of safety matters within the Air Force, and the increased use of simulators for pilot training.

There were other factors as well. The Air Force's flying safety program as a whole, and PACAF's own approach to aircrew safety issues, may well represent a successful application of several principles of organizational excellence, which are becoming increasingly familiar to Air Force commanders and managers through such studies as Tom Peters' and Nancy Austen's *A Passion for Excellence.*

It is becoming increasingly clear that these "excellent organizations," whether they are in the private sector or the military, are defined by certain identifiable common characteristics. Excellent organizations firmly understand their purpose, mission, and values. From the chief executive or commander downward, these values and goals permeate the organization until they become part of the process of doing everyday business.

The excellent organization's structure is simplified, with as few levels of management as necessary, and it is both flexible and fluid. Autonomy and responsibility percolate throughout to involve people at the most basic level in decision-making processes and to give them a stake in the action.

Excellent organizations achieve and maintain a high quality of mission performance by focusing on the well-being of their people, indeed a "people orientation" and respect for the individual are at the heart of the excellent organizations' philosophy. These organizations encourage autonomy, creativity, and risk taking, and they close the loop by building and maintaining a vigorous and visible reward system.

PACAF's safety achievement was the culmination of 3 years of intense effort. In 1982, PACAF had its worst flying safety record since the mid-sixties, with 10 aircraft lost and a Class A mishap rate of 8.74. In responding to this situation, Lt Gen Arnold W. Braswell, CINCPACAF, chose an assertive command approach, adopting a suggestion from

his safety office to formally establish the goal of winning the 1983 Secretary of the Air Force Safety Award. PACAF's flying safety record improved dramatically that following year — and with the improvement came the award. PACAF's 1984 record, though not quite as exemplary, by no means marked a return to 1982's dark days. (The command suffered two logistics factor Class A mishaps, but in neither year did PACAF suffer aircrew fatalities.) Then came 1985's spectacular success story.

How did PACAF's achievement in flying safety reflect the characteristics of the excellent organization? Certainly senior leadership direction, interest, and support played a crucial role. General Braswell's enthusiasm for the safety program was continued by his immediate successor, Gen Jerome F. O'Malley, and later toward the end of 1984 by Gen Robert W. Bazley. General Bazley was intimately familiar with all aspects of safety, having served as the Air Force's Inspector General before coming to the Pacific. General Bazley conveyed to those tasked with safety program administration, as well as those whose responsibility it was to implement the program — the wing commanders — that safety would continue to be a priority.

Responsibility and autonomy were infused downward into PACAF units in two ways. Because of the unique geographical and political situations faced by many PACAF organizations, promulgation of a standardized command-wide safety program was a virtual impossibility. This fact increased, by necessity, the unit commander's authority and autonomy. In turn, creation of a decentralized approach engendered a sense of pride and ownership at the unit level and resulted in more effective management of the safety program.

A second impetus toward decentralization came with introduction of the squadron flight safety officer program in PACAF and TAC. Beginning in 1984, a formally trained flight safety officer was assigned to each flying squadron. Only one full-time flying safety officer remained at wing level, but that person was joined by the maintenance flight safety NCO, who coordinated the wing's maintenance flight safety program. Implementation of this initiative and the placement of skilled and effective pilots into these squadron positions served to keep attention focused on safety issues at the unit level.

A third area was unity of purpose. Establishing a command goal to win the Air Force safety award in 1983, after such a disastrous year, may have seemed somewhat premature, but the goal centeredness and direction this decision provided served as a vehicle to ensure continual emphasis on safety at all levels. Safety emphasis was refined further by the decision at PACAF to focus on operational factors, discipline, attention to regulations, and the need for awareness of spatial disorientation and G-induced loss of consciousness.

Seen from a managerial perspective, PACAF had established a clear goal, which had gained credibility through impassioned support at the top. Command leadership had established a mechanism for encouraging safety, while it also had implemented a structure allowing the most basic organizational building block, the flying squadron, to implement and emphasize the safety program. The results over a 3-year period are indisputable.

Probably no one factor or set of factors can provide a wholly sufficient explanation for the Air Force's continued improvement in flying safety. Technology and safer airplanes are clearly relevant. Professionalism, self-discipline, and attention to basic principles of safety are important, as is the quality of training received by aircrews.

However, it should be noted that the organizational strategies, leadership philosophy and energy, and structural mechanisms to encourage individual reponsibility and a clear vision of goals have played an essential role from senior commanders to the unit level. At least, in part, the Air Force pursuit and attainment of organizational excellence has both created and reflected its achievement in flying safety. The lessons learned here might also provide valuable insights for other program areas. ■

General Bazley stated, "This achievement is a testament to the high quality of aircraft and people who fly and maintain them here in PACAF."

The unique geographical and political situations faced by the different units dictated a decentralized program. The sense of pride and ownership at the unit level resulted in more effective management of the safety program.

"A Quiet Sunday"

I just finished reading "A Quiet Sunday" in the January 1986 issue of *Flying Safety* and am amazed at the lessons learned by the aircrew, or should I say the lack of lessons learned.

The writer never seems to consider that failure to abort the mission in the face of known wind shear and adverse weather was the real cause of the incident. Not only was he familiar with the afternoon thundershowers at Mountain Home, but he observed the adverse effects of wind shear on a Lockheed Electra seconds before his takeoff roll, probably not even considering that the Electra had more excess power available to climb out of the wind shear than his T-33 did.

The writer seemed intent on making his stop "quick," while also trying to avoid the "nuisance of a muddy canopy." He then tried to justify continuing takeoff by saying that the lessons learned included using more runway, recognizing the clues for wind shear (but not anything about staying on the ground to avoid said wind shear), and being ready to jettison, if required.

It is too bad that, with adverse weather still being a major factor in many aircraft mishaps, the aircrew did not recognize their severe case of get-home-itis and stay on the ground where their safety was virtually guaranteed.

It is also too bad that the aircrew did not learn patience is a virtue. It is always smarter to stay put in the face of possible severe weather, put a dime in the phone and call the loved ones, and wait it out. I would rather do that than have someone else call to say I didn't make it.

Lt Will Gildner, USN
VF-211, NAS Miramar
San Diego, CA

Thanks for your letter. You're absolutely right about the dangers of "get-home-itis." It has been the cause of many mishaps over the years. We always need to consider all options in any situation, and the best option may be to stay on the ground.

Well Done Award, May 1986

While not attempting to detract from the outstanding airmanship demonstrated by Captain Alan Martin during his T-38 functional check flight at Laughlin AFB, I do disagree with one statement made in the article. This is the statement about a T-38 not ever being successfully landed with so much damage to the horizontal tail.

I was stationed at Vance AFB in Enid, Oklahoma, from 1968 - 1972 as a T-38 IP. During this time (I think the year was 1970), 2 aircraft from a four-ship training sortie were involved in a midair collision. During a rejoin, 3 and 4 overshot and lead increased bank to get more separation. Number 2 lost sight of lead and came down across the top of the lead aircraft, severing both the left flap and the *entire* left stab.

All that was remaining was the stab actuating cylinder sticking out of a hole torn in the side of the aircraft. The Number 2 aircraft lost the entire nose section back to the cockpit, and the solo student bailed out safely. The lead aircraft flew back and landed. It was obviously a Class A mishap, and some record must be still available to verify these actions.

Lt Col R. Todd Schwenke, USAF
66 ECW/SE
APO New York

Thanks for your letter. You're right about the T-38 midair and the damage to the aircraft. The mishap happened nearly 20 years ago. It's no wonder the writers of the award recommendation for Captain Martin didn't know about the previous mishap. ■

MAIL CALL

EDITOR:
FLYING SAFETY MAGAZINE
AFISC (SEDP)
NORTON AFB, CA. 92409

"Press"

■ There I was . . . finishing my 20th or so, cup of coffee, contemplating my impending retirement, and looking back on 20 years of flying. Well, it wasn't really 20 years. I traded in my knee board for an in-basket a while back, but I still put "Pilot, USAF" in the "previous employment" block on my resume.

This afternoon, I was doing my usual nostalgic cover-to-cover of the flying safety magazines when I encountered the short "Press" article (Ops Topic) in your May issue. By the time I had answered the first three of the author's questions, I learned something new about flying safety.

Have I ever flown feeling less than 100 percent? You bet!

One time, during a rather messy divorce, I found myself missing my kid, drinking too much, sleeping too little, and wondering how I was going to pay the bills she left without the money she took. I had to get over the feeling I wasn't worth a plugged nickel as a man, much less a husband and father, and get my act together. I read one of those "don't fly if you're not fit" articles, said to myself, "that's me," and headed for the scheduler's desk.

"How about taking me off the schedule for a couple of days?" I asked.

"No way," he replied. "I need you for a dawn FCF tomorrow, and you're going to have to take George's place on the Red Flag next week. His wife's sick, and he needs to watch the kids."

So, I went to the ops officer. He said, "Not unless the doc says you're DNIF." The flight surgeon sent me to mental health where I was briefed that I stood a good chance of losing a bunch of things, including flight pay, if they even opened a file on me.

Daunted, but firm, I spoke to the squadron commander. There I was reminded of the heavy summer schedule, told not to "press," and put in crew rest for the FCF.

So, I flew at less than 100 percent.

Have I ever pressed the weather?

Once or twice. We called it "hacking the mission." The bird was on the morning schedule, and an RON off station wouldn't cut it. Another time, I yielded to crew pressure to get home. Once, believe it or not, it was to get an 0-6 to a dining in.

Have I ever flown a jet with required systems not fully operational? Again, you bet!

Why? Have you ever heard of 20-day no-flys? How about sortie rates or on-time takeoffs? What would you do when, after being shown the minimum equipment list, the ops officer, your rating official, says, "If you won't take it, I'll take it myself?"

We all know what the author of "Press" meant, and he's *right*. Now, why not take that article and make it mandatory reading and policy for supervisors? Better attach a copy of General Mall's "One Mistake Career Mentality" (May 1986 *TIG Brief*) article to it, though.

Until the fragile nature of an officer's career is unthreatened by sticking to the rules, until professional courage ceases to be professionally dangerous, until supervisors practice and admire what the safety folks preach, an on-time takeoff will take precedence over weather, minimum equipment lists, and stressed out pilots every time.

Face it. I doubt you'll print it, but face it.

Major Michael T. Fagan, USAF
Bedford, MA

Mail Call is for you, the reader, to express your opinions and concerns on current safety issues. We don't censor the letters even though they may not reflect Air Force policy on a particular subject. Major Fagan has stated his views on what he sees as a potential threat to safe operations. Evaluate your own operations with these thoughts in mind.

"Riding Shotgun for the Shuttle"

In your May 1986 issue, you have an article called "Riding Shotgun for the Shuttle." As a member of the 919th SOG, I feel compelled to point out several inaccuracies. First, the call sign for our aircraft is PEPOD, not REPOD. Second, the pilot does not open the cargo doors, the illuminator operator does. And last, but not least, we are not the 717th SOS, we are the 711th SOS (oh, thank heaven, etc). Other than that, we here at Duke Field enjoyed the article.

Also, in your letters feature of the same issue, MSgt Norman Faith, Jr., raises some questions about the AC-47. Sorry, but while some AC-47s were equipped with .30 and .50 caliber machine guns, they were replaced with 7.62mm miniguns as they became available. There were plenty of gun mounts but a shortage of guns, and none were pintle mounted, all were fixed mounts. By the way, the original designation for the AC-47 was FC-47.

TSgt Steven E. Gardinier
919 SOG/711 SOS
Eglin AFB Aux Fld 3, FL

Thanks for your letter. We apologize for the minor errors in the article. Calling the 711th SOS the 717th was our mistake. It was a typo made when the printer set the type, and we didn't catch it. We try to catch such mistakes, but an error will occasionally slip through. Thanks also for your information about the AC-47.

BASH Photo Contest

■ The Bird-Aircraft Strike Hazard (BASH) Team at Tyndall AFB, Florida, ran a photo contest for BASH-related photographs. All flying safety offices were encouraged to enter material. Photos were judged on technical quality, subject matter, and composition. Winners received the coveted BASH T-shirt. Here are the four winning photos. (Photos 2 and 3 were retouched by our artist prior to publication to remove gory details. — Ed.)

1. Hawk strike to an F-4 canopy on low level from Kelly AFB, Texas. This shattered windscreen produced instant IMC conditions — not to mention the wind blast and blood and guts.

2. White-tailed deer strike to an F-4. The mishap aircraft was No. 2 in a three-ship formation takeoff from Wright-Patterson AFB, Ohio. Only an excellent effort from the pilot averted disaster in this 130 knot abort.

3. Turkey vulture strike to a T-37 wing root in the traffic pattern at Laughlin AFB, Texas. This photo graphically demonstrates the severe impact birds can have on our aircraft — even at T-37 airspeeds.

4. Red-tailed hawk strike to an F-111 at 475 knots low level from Cannon AFB, New Mexico. Not many pilots have flown while peering down the end of their own pitot tubes and lived to tell about it. An outstanding effort to set this one back on the ground.

The BASH Team thanks all the entrants for submitting such excellent photos and would like to encourage anyone to send pictures in the future (color slides are preferable, but any type will do). These pictures will be used in briefings and publications. We always need and welcome new material.

For more information on the BASH problem, contact the BASH Team at AUTOVON 970-6240. ■

tech topics

TIPS FROM THE FIELD

■ SSgt Willie Dee Rachel, a quality control inspector with the 376th Strategic Wing at Kadena AB, Japan, gave us this safety tip. Perhaps it can help others in the maintenance work areas.

Avionics shop people, such as those who work on the APN-59 search radar for KC-135 and C-130 aircraft, must occasionally adjust system components with electrical power applied to the units. Considering the voltage and that certain tools may be required (that are not already insulated), a hazardous situation exists.

Sergeant Rachel offers this safety technique. If a metal scribe is needed (such as in making adjustments), have a machinist set it into a serviceable screwdriver handle. Or, if the adjustment task requires an open-end wrench, weld one end of the wrench to a screwdriver handle (Picture 1). This gives the maintenance technician insulated tools for making the required adjustments, such as those required on the AN/APN-69 radio beacon unit (Picture 2).

Photo 1

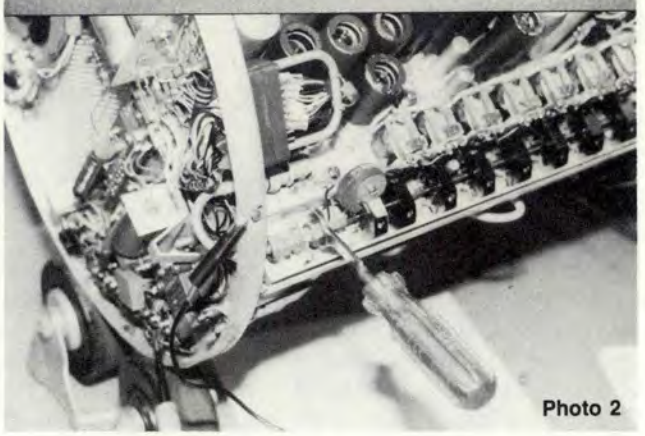


Photo 2

WASTEBUSTER

"I don't want it.
I don't need it.
How do I get rid of it — legally?"

This question is commonly asked by anyone who has had to deal with the Air Force supply system in disposing of XB-3 items — the things typically thought of as "disposable assets." There is simply no way of getting them out of your hair, off your hands, and out of your tool room, short of dumping them in bulk lots into the nearest Dempsey Dumpster. Right? Wrong! Now you have something to help unload XB-3, without going to jail.

Wastebuster was developed by TAC in response to the cries for help from troops on the firing lines. Wastebuster looks at a number of supply problems and comes up with simple solutions. Eight major and very common complaints led up to this:

■ Procedures for the turn-in of XB-3 items were typically complicated, cumbersome, and confusing.

continued

tech topics

■ "Serviceable noncredit turn-in" was synonymous with poor management of resources.

■ Bench stock managers have assumed — often correctly — low usage of an item would result in item deletion.

■ When you only need two washers, and order two washers, you usually got the full hundred-piece unit of issue.

■ The code "XB-3" was assumed to mean the item could not be reclaimed, repaired, or reused.

■ Inspection teams historically frowned on retention of work order residue and shop stocks.

■ Incorrect source, maintenance, and recoverability codes (SMRC) went unchallenged and uncorrected.

■ Non-DIFM (due in from maintenance) assemblies usually aren't broken down into obtainable bits and pieces.

With these things in mind, supply set about correcting misconceptions and misapplications of their policies.

The first area that really makes a difference to the basic supply customer is the maintenance of bench stocks. The new system is simple. The user will decide: (1) What items to delete from the stock list, (2) what items need to be added, and (3) whether levels should be increased or decreased.

The second major change created by Wastebuster is the establishment of unit turn-in pickup points. These are simplified means of getting the XB-3 out of your shop and into supply's or someone else's.

Wastebuster draws the line between trash and nontrash XB-3. Trash is anything that cannot possibly be of any value to the government as salvage or scrap (empty paint cans, old light bulbs). Nontrash is anything the government can reclaim, recycle, or resell to a potential customer. The unit pickup points are sets of three containers, located in areas of high XB-3 usage. They are color-coded, like equipment status tags, in yellow, green, and red.

■ The yellow barrel holds serviceable identifiable items. If you have a widget that can be reused, tag it with a DD Form 1574 serviceable tag, listing its stock number, nomenclature, and your organization and shop code, and put it in the yellow barrel. Supply will pick it up and place it back on the warehouse shelves. This includes excess serviceable bench stock and work order residue — just be sure to identify it.

■ The green barrel holds repairable/unidentified items. The barrel monitor will periodically go through this bin and sort out the items, routing some through the appropriate shops for repair, or putting them into one of the other two barrels. Tag these with your organization and shop code, and stock number if known.

■ The red barrel is for unserviceable/scrap items. Widgets mangled beyond recognition, one-jawed wrenches, and U-shaped screwdrivers go here. This bin will be carried to the salvage yard or supply by the monitor with an AF Form 1348.

No longer will we need to fill our dumpsters with broken engine cowlings, intake covers, wrenches, and the extra 98 washers. Wastebuster is here to help out!

— Courtesy of 1Lt Vanessa L. Delapp, Maintenance Officer, 27 TASS, George AFB, CA.

UH-60A: AFTO 781 TABOO

During a prerunup check of the UH-60A helicopter, the pilot aborted the flight after experiencing "ratcheting" in the flight controls. ("Ratcheting": Similar to tool ratcheting in that movement is in only one direction, may be stopped at any point, but will continue in the same direction versus back and forth.)

A helicopter mechanic, en route to get a 7-level technician to assist in troubleshooting the problem, met the unit's helicopter technical representative and asked him to help troubleshoot. The tech rep, assisted by the flight engineer, disconnected the red main rotor blade pitch control rod by removing a bolt at the spindle horn while the mechanic watched. Although all three people were aware of the disconnected rod, no one documented it in the aircraft AFTO 781 forms.

After the flight control system was operated through full travel, the red spindle droop stop bearing was found to be dirty. During swing shift change, the me-

chanic gave the washers for the red pitch control rod to his relief man on the swing shift, who gave them to the swing shift supervisor.

At an undetermined time, to prevent losing the washers, the shift supervisor reconnected the pitch rod bolt to the spindle horn, installed the washers on the bolt, and hand tightened the nut. The correct procedure to torque the nut and install a cotter key was not accomplished. Later that evening, the supervisor returned to clear the Red X discrepancy for the ratcheting problem, but forgot to check for the correct installation of the pitch rod bolt. Since there was no documentation in the aircraft forms, others on the shift were not aware the pitch rod had been disconnected earlier.

Four days later, the helicopter was preflighted and flew for 2 hours on the first leg of a cross-country flight. After landing uneventfully at an intermediate stop for fuel, the crew chief noticed a nut on the ground next to the helicopter. On inspection of the rotor system, the red pitch rod was missing the nut, washers, and cotter key. In addition, the bolt had worked itself out approximately one-third of its length.

Had the bolt worked itself out during flight, the red main rotor blade would have become uncontrolled, and the helicopter and crew could have been lost.

If you find yourself in a similar situation and are tempted to forget to document the 781, think about this incident. Take the time to make the applicable entries in the forms. And, while you're at it, don't forget those crucial few minutes at shift turnover. You may even want to show your relief person what you disconnected on a particular task. If you do these things, you can be assured they will pay big dividends in safety and maintenance reliability.

F-5 UNSECURED BOATTAIL

To perform maintenance training for F-5 crew chiefs, maintenance people removed the boattail (aft section) and placed it unsecured on a dolly located to the right rear of the aircraft. About an hour later, after returning from a flight, an F-15 turned into its parking spot. As the exhaust of the Eagle turned towards the F-5 parking area, the boattail was blown off the maintenance dolly. Not only were the boattail and both horizontal stabs damaged, but so were the F-5's right wing trailing edge panel and Aero-3B.

What was it that contributed to the boattail coming off its dolly, costing the Air Force $58,000?

The F-5 tech data requires that the boattail, when removed, be secured on a dolly with two V-bolts and a securing strap. The dolly used in this mishap had only one V-bolt and no securing strap, allowing for the unsecure condition.

Keep this costly mishap in mind as you look around your own flight line. Recently, at two separate bases, AIM-7 and AIM-9 missiles were blown off of their respective trailers by aircraft taxiing in the ICT (integrated combat turnaround) areas. A few years ago at one of our European bases, a vehicle was overturned by the exhaust of a taxiing jet fighter.

The key to any successful mishap prevention program is identifying known or potential hazards . . . and taking adequate corrective action. Take a look around and consider the unlocked or unsecured portable cranes and maintenance stands. Or how about those unsecured aircraft panels and parts or unlocked canopies (either not fully opened to the locked position or without canopy safety struts installed)? From the first predawn launch until the last aircraft down from night flying has been tucked in, everyone on the flight line needs to ensure things are secured from the exhaust blast of taxiing aircraft.

As a final note, it should also be noted inclement weather, such as gusty winds, can cause things to go "bump in the night" (or day!). Regardless of the prevailing conditions, which includes the aircraft parking plan, it's up to all of us to prevent objects from being tossed around. ■

No Smoking, Please!

■ An Army C-12C mishap occurred recently that was strictly for a non-smoking crew. On descent, both internal ferry tanks split and up to 40 gallons of JP-4 spilled into the cabin. The crew leveled the aircraft, went on oxygen, declared an emergency, depressurized, and turned off unnecessary electrics. The descent continued at 120 knots and no flaps until touchdown, when the aircraft was shut down. Two to three inches of fuel remained in the belly.

The crew did an admirable job to walk away from this little nasty. Generally, however, it is advisable not to touch the electrics but rather to use them as little as possible. Turning off electrical equipment (switch-contact arcing) may cause more problems than it solves. It appears that lack of tank ventilation may have been the cause of the mishap.

— Sqn Ldr A.G. Bridges, RAAF, Directorate of Aerospace Safety.

Loss of Control

An instructor pilot (IP) and student pilot (SP) were making a full flap touch-and-go landing in a light aircraft. The aircraft touched down slightly left of centerline, and the student started to add power. The IP told the student to reduce power and raise the flaps to 20 degrees before advancing the power. The SP looked inside the cockpit to reduce the power. At the same time, the IP looked inside the cockpit to raise the flaps to 20 degrees.

While both pilots were looking inside the cockpit, the aircraft drifted back to the right side of the runway. When the IP looked back outside, he discovered the aircraft's left wing was raised, the aircraft weight was on the right main gear and nose gear, and the aircraft was headed toward the left side of the runway. The IP took control, aborted the takeoff, and applied left aileron to level the wings. The aircraft entered a skid and continued to the left. Just prior to departing the runway, the left main gear came back to the ground, but too late for the IP to regain control.

The aircraft departed the runway at a slow speed and was not damaged. The pilots ground egressed uneventfully. Maintenance found no mechanical problems that could have caused the loss of control, and neither the pilots or others who saw the incident could explain how the aircraft got out of control. Crosswinds were not a factor.

The big problem in this mishap is that both pilots had their eyes in the cockpit at the same time during a critical phase of flight. In attempting to help the SP, the IP lost situational awareness and let the aircraft get out of control.

F-16 Flight Controls

Engine start and pre-taxi checks were all normal including the flight control self-test. Normal control stick movement checks resulted in normal movement of both flaperons. While taxiing for takeoff, the pilot performed a second control stick check for flight control movement and noticed the left flaperon did not appear to respond to stick movement at all. After quick check was completed, the pilot performed another flight control system (FLCS) self-test to see which steps failed and doublechecked position of system switches. During the test, the right flaperon responded normally while the left flaperon again did not appear to move, but the FLCS passed the self-test.

The pilot ground aborted and returned to the chocks and was met by a flight control specialist who requested that he repeat the FLCS check. The system again indicated normal operation exactly as before with no apparent movement of the left flaperon noted. The pilot then held the control stick full left, and the flaperon began to move after 3 to 5 seconds and reached full up position after an additional 4 to 5 seconds. Neither the self-test or trim wheel resulted in any movement of the left flaperon.

Maintenance found the integrated servo actuator (ISA) which controlled the left flaperon had failed internally. The ISA was replaced, and the flaperon operated normally. They also found the FLCS self-test was operating normally. The defective ISA

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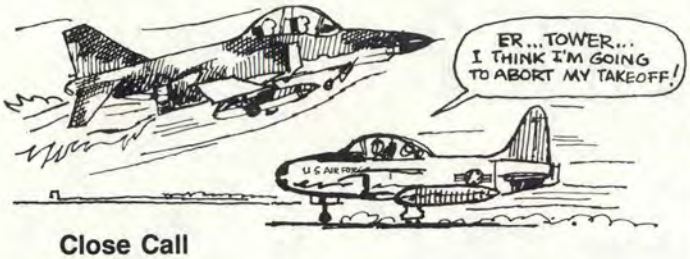
didn't trigger a failed test step because the test checks for presence of movement alone. The tolerance for movement is 1.65 degrees in 4.8 seconds which, when compared to normal flaperon movement, appears to be no movement at all.

Caution: All F-16 users be aware of the limitations of the FLCS self-test system and ensure you visually check flight controls for movement.



Close Call

The pilot of a T-33 called for an opposite direction takeoff on the main runway. The T-33 was told to hold short due to an H-3 on 7-mile final. He was also told to expect about a 5-minute delay. The T-33 pilot acknowledged both transmissions.

Shortly thereafter, the pilot of an F-4 called No. 1 for takeoff. The tower controller cleared the F-4 for takeoff, and the F-4 pilot acknowledged. The F-4 took off and was airborne about midfield when the T-33 pilot called aborting his takeoff and told tower he was turning off at midfield.

The T-33 pilot thought he had been cleared for takeoff. He said when he acknowledged takeoff clearance, someone "stepped on" his transmission. Tower didn't hear him acknowledge. The phonetic call signs of the two aircraft were different, but the numerical suffixes were the same. No doubt this contributed to the confusion.

The tower controller didn't see the T-33 on the runway. He was watching the F-4 departure and the H-3 arrival to make sure there was no conflict. There was also reduced visibility due to weather.

This incident is still under investigation, but there are several things we can learn from it. Listen for your complete call sign, not just part of it. Make sure you use your complete call sign for all transmissions. Listen to the radio to learn what other traffic is in the area and where it is located. If you get an unexpected clearance, doublecheck to make sure it's for you. Remember, "heads up" flying begins on the ground.

Heads Up!

A flight of three fighters was on radar vectors to a TACAN final approach in VFR conditions. The flight was cleared for a rapid descent from 9,000 to 5,000 feet MSL and cleared to the final approach fix. As they were passing about 6,600 feet, RAPCON called out traffic at 12 to 1 o'clock at an indicated altitude of 6,500 feet. The flight lead made an immediate call to the flight to pull up. The flight missed a Cessna 172 by 50 to 100 feet. The Cessna was at a legal VFR altitude and was not under anyone's control.

Everyone involved in this near miss was operating according to published directives. The RAPCON controller is only responsible for the safe separation of traffic being controlled. VFR advisories are an additional service. The controller was very busy in this case and still managed to make the advisory call, even though a little late. The flight lead did an excellent job of taking immediate action to avoid the traffic. The Cessna pilot was legal, but apparently wasn't looking outside.

This is a good lesson in the importance of good see-and-avoid techniques. Remember, it is the pilot's responsibility to remain clear of other aircraft when in VMC conditions. Don't stop clearing just because you're on a radar vector.

Near Miss

A KC-135 was descending through 13,800 feet when the crew received an advisory of traffic at the 11 to 12 o-clock position, 3 miles, 11,500 feet, unverified. At 11,500 feet, the traffic, a single-engine light aircraft, was spotted by the navigator. The traffic was co-altitude and passed with approximately 300 feet lateral separation.

Some good lessons can be learned from this close call. First, use all available crewmembers to look for traffic. Pilots aren't the only ones who know what an airplane looks like. Second, don't just blindly press on if you can't confirm you will pass clear of the traffic. Ask the controlling agency for vectors around the traffic or an altitude change.

The key words are *See and Avoid*! This includes both reported and unreported traffic. ■

Flying Safety has to serve a much larger audience now. So, our readership ratio has changed from 1 magazine for 3 people to **1 magazine for every 12 people.** Please remember to pass it on so everyone can read it. Thanks.