flying

SAFETY

SEPTEMBER 1989

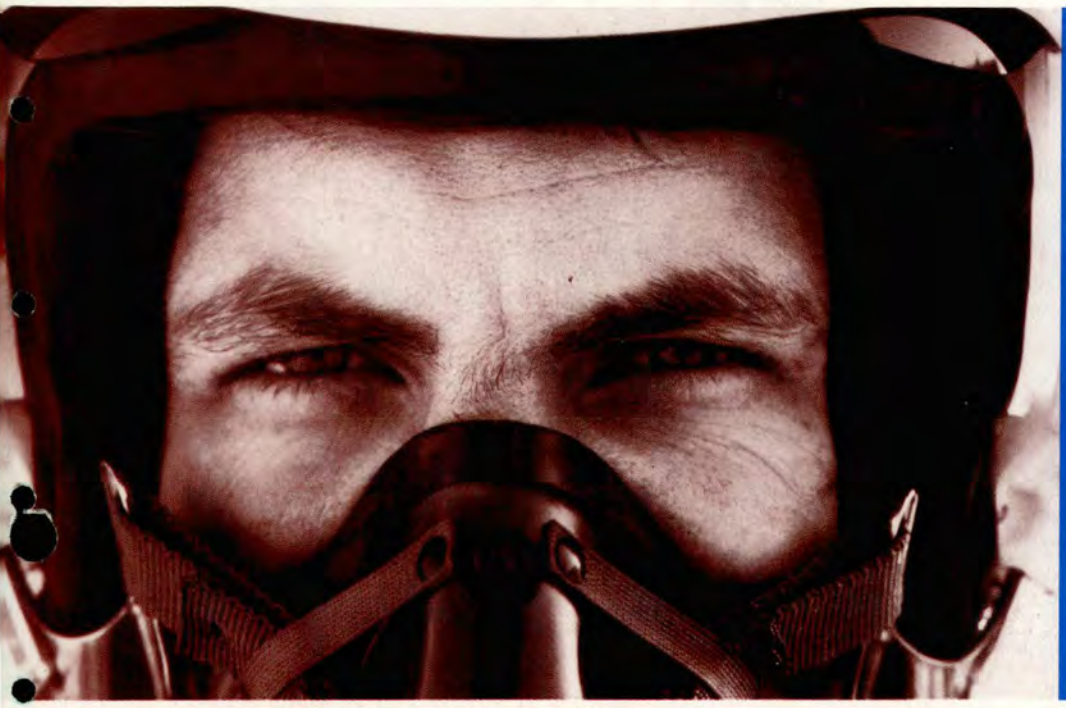
42 Marvelous Years of Progress and Safety

Hank

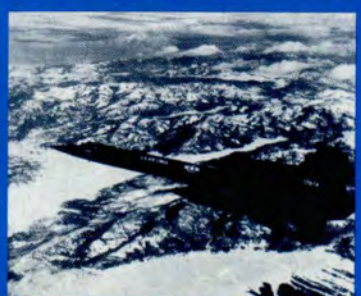
Soaring Costs of Mishaps

Jet Lag

NOTAM News



CELEBRATING 42 YEARS OF AVIATION HISTORY 1947-89



REFLECTIONS

■ Reflecting over my last 35 years of service and the many achievements of our Air Force, the one factor of success that stands out above all others continues to be *people*. I marvel, time and again, at your strength, diligence, and resilience. We've all heard it before — "people are our number one resource." It is not a trite statement, but a fact! Without your enthusiasm and professional efforts on the flight line, in the air, in the offices and shops, around the clock and around the world, our mission wouldn't, and couldn't, happen.

As The Inspector General these last 2 years, I've been particularly pleased to watch your progress in the safety arena. Because of you, we have a safer Air Force. Our mishap rate continues to be among the lowest in the world — and today we fly some of the most demanding missions in aviation history. Similarly, ground mishaps are currently at the lowest rate in our history. You control both of these trends by attention to safe practices, on- and off-the-job. I've watched the transition that brought us to an era where we have the best training, the best equipment, and quality people. We've gone through some tough periods in the last 35 years, and there is no doubt there will continue to be more challenges in the years ahead. I know you are ready for the task. Continue to set your sights and standards high.

I leave this great Air Force very proud of you and all your many accomplishments. ■

Donald Lary

BUFORD D. LARY, Lt Gen, USAF
The Inspector General, OSAF

UNITED STATES AIR FORCE

flying

SAFETY MAGAZINE

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SPECIAL FEATURES

REGULAR FEATURES

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Safety Warrior

Advances in technology in the 1940's quickly propelled the newly formed USAF into the jet age. The F-51, F-86, and F-84 each had key combat roles in helping to maintain our country's air strike force.

Forty-two marvelous years of progress and SAFETY

LT COL KENT D. KOSHKO
Editor

"Maximum safety can be attained only by employing to the highest degree the knowledge gained from past experience and the results of research and study."

First issue of
Flying Safety Magazine, 1948

■ **ATTENTION ALL AIR FORCE PERSONNEL:**

Congratulations on the great job you are doing for flying safety! You and your predecessors have made impressive strides over the past 42 years, and each of you can take pride in your accomplishments.

Historical Notes

In the early days of aviation, the Army recognized the potential value of the airplane for air-to-ground observation and rapid communication. On 1 August 1907, an Aeronautical Division was established in the Office of the Chief Signal Officer of the Army to study the flying machine and the possibility of adapting it to military use. Interest grew, and on 10 February 1908, the Air Service contracted with the Wright Brothers for America's first military airplane. The aircraft was to carry two men in continuous flight for 1 hour at a speed of not less than 40 miles per hour.

In preparation for our first aircraft, test trials were needed and sometimes costly. The U.S. military's first fatal aircraft mishap occurred in 1908 when Lt Tom Selfridge rode as a passenger with Orville Wright. They were testing a new propeller in preparation for an upcoming speed trial. Lt Selfridge, for whom the Michigan Air Base was named, was a fatality. Orville Wright spent 6 weeks recovering in the hospital.

In July 1909, the acceptance flight was finally completed on a 10-mile round robin cross-country from Ft Myer, Virginia, to Alexandria and back.

As in most new technologies, progress developed cautiously. At the end of World War I, the U.S. had 740 airplanes and 744 pilots left. We had lost 357 airplanes and 35 balloons during combat.

The safety record of the early military fliers was dismal, to say the least. From 1921, the number of mishaps rose until 1943 when the Army Air Force had over 20,000 major aircraft mishaps in the continental U.S. alone. That's 56 class A mishaps each day! That year we lost 5,600 crewmembers!

In 1947, when the Air Force became a separate service with over 25,000 aircraft, we experienced more than 1,500 major mishaps.

Many accomplishments marked the early years of the Air Force. From 12 May 1947 until 30 September 1948, the newly formed service supported the "refugees" of West Berlin. The Air Force hauled over 1,500,000 cargo and passenger tons on 195,998 perilous flights, many in unfavorable weather conditions. During this impressive airlift effort that involved many air and ground

risks, 35 Americans lost their lives in mostly nonflying mishaps.

In March 1953, the Air Force's Inspection and Safety Center established a safety training school, in conjunction with the University of Southern California, to help combat an unacceptable number of aircraft mishaps. It remains the only one of its kind in the world and attracts safety specialists from civilian industry and foreign governments.

To enhance the safety school, a unique outdoor "crash lab" opened in July 1965 at Norton AFB. Safety specialists learn investigation techniques that help them solve future mishap problems.

Since 1974, we have experienced less than 100 Class A mishaps annually. At press time in FY89, we've had a total of 52 Class As. That's some progress when you consider the complexity of today's weapon systems and demanding missions. However, we won't be satisfied until the number is zero.

You have reduced mishaps through hard work, innovative programs, dedication, and perseverance. Preparedness is the key to success, regardless of the task. And history is full of great examples where the victor was the best prepared.

A Multitude of Firsts

Safety experts, aircrews, maintenance people, and support specialists have done a phenomenal job in helping to improve flight safety through a multitude of firsts.

- The Air Force is the first service to employ the use of aviation psychologists to help aircrews become more aware of themselves and their strengths and weaknesses in flying. This program has helped families recognize safety aspects, has improved morale, and helped the crewmember become more aware of their performance in the cockpit during flight.
- We pushed for the distribution of the improved LPU-9P self-inflating life preserver, and
- We lobbied for SEWARS, the water-activated release system designed for high-speed ejection that will enable crewmembers with broken or dislocated limbs to survive.

Since 1955, the C-130 has become the backbone of tactical airlift, providing a first in capability to the most austere locations. The Hercules, flying with active and reserve forces, has maintained a strong safety record for over 30 years.

- We recognized the need to ground the fleet when an aircraft experienced a major problem so we could fix the malfunction and ultimately save lives and improve readiness.
- We insisted on improved aircraft and maintenance reliability.

A Bright Future

Some of your sound ideas toward flying involve a plain commonsense approach ... **plan and prepare thoroughly.** Some of these ideas are ageless, but they require periodic review to breathe new life and fresh air into them.

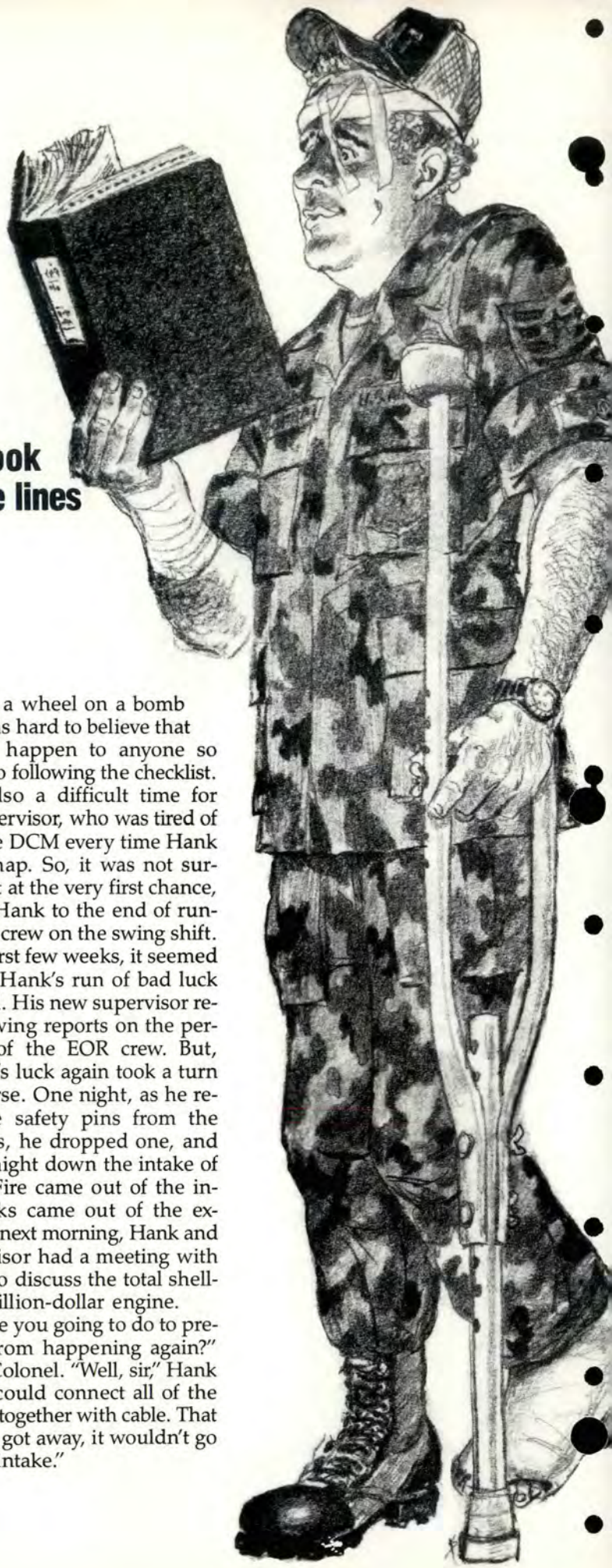
We still have a ways to go, but the future looks promising with bright people continuing to find better tactics and safer ways to fly and maintain our aircraft. ■

One of the finest fighter aircraft in the world today, the F-15 Eagle maintains a strong safety record while flying complex mission scenarios. The Wolfhounds of the 32 TFS at Soesterberg AB, Germany, epitomize the Eagle's capability with an excellent safety record.

HANK

The man who followed the book but who didn't read between the lines

CMSGT ROBERT T. HOLRITZ
Technical Editor



■ After reading the report of a fatal mishap that occurred in spite of the fact that everyone involved followed tech data to the letter, I thought of Hank. Hank was a good old boy. He was as honest as an Eagle Scout, and he'd give you the shirt off his back. It was well known by the members of his load team, as well as his supervisor, that Hank was a stickler for following the book. Almost obsessively he would go down the checklist step by step, ensuring each action was carried out to the letter. Hank left nothing to chance.

Yet, in spite of his virtues, Hank was a man plagued by bad luck. The index finger on Hank's left hand was a constant reminder of the cloud of misfortune that seemed to float above his head. It terminated just above the second joint as the result of being caught between a 500-pound bomb and a hook of an ejector rack.

To say that this particular month had been a bad one for Hank would be a gross understatement. He received 12 stitches when he hit his head on the fin of a bomb during a post load check. His hand was badly bruised when it was caught between two bombs being positioned on a trailer, and he was walking with a limp after his foot got in the way of a wheel on a bomb truck. It was hard to believe that this could happen to anyone so dedicated to following the checklist.

It was also a difficult time for Hank's supervisor, who was tired of briefing the DCM every time Hank had a mishap. So, it was not surprising that at the very first chance, he traded Hank to the end of runway (EOR) crew on the swing shift.

For the first few weeks, it seemed as though Hank's run of bad luck had passed. His new supervisor received glowing reports on the performance of the EOR crew. But, alas, Hank's luck again took a turn for the worse. One night, as he removed the safety pins from the bomb racks, he dropped one, and it went straight down the intake of the F-111. Fire came out of the intake. Sparks came out of the exhaust. The next morning, Hank and his supervisor had a meeting with the DCM to discuss the total shelling of a million-dollar engine.

"What are you going to do to prevent this from happening again?" asked the Colonel. "Well, sir," Hank said, "we could connect all of the safety pins together with cable. That way, if one got away, it wouldn't go down the intake."

The DCM thought his suggestion had merit and immediately issued an edict that all bomb rack safety pins would be attached together in sets.

All went well for the next few weeks. Again, it looked like Hank had finally come out of his hard luck streak. Even the DCM was able to sleep at night, not wondering what would happen next to Hank. But, alas, as Murphy's law states, "If it can happen — it will."

The wing commander was scheduled to fly that night. When he taxied to the end of the runway, Hank's crew pulled the safety pins and gave them to Hank. As was customary, Hank raised the set of pins to show the pilot they were removed. What happened next?

Well — if you haven't already guessed — as Hank reached for his checklist to ensure all of the steps had been performed, he accidentally dropped the pins. Immediately, the streamers, at the beckoning of the no. 1 engine, stood at attention. In an instant, the entire set of pins, nicely wired together, went directly down the intake. Once again, fire came out the intake and sparks flew out the exhaust. The Wing King was not pleased.

As it had almost become a tradition, the following morning, Hank and his supervisor had an appointment with the DCM. Something told Hank's boss that this would not be like the past meetings with the DCM. This time there was an air of doom that extended into the Colonel's outer office. His receptionist was normally pleasant and reassuring in times such as these. Today, however, she acted like a prison guard. "The boss is waiting for you," she announced in a cool tone of voice.

As things turned out, this was Hank's last meeting with the DCM. Hank was assigned as a special assistant to the Vehicle Control NCO. In this capacity, his only responsibility was to make a weekly record of vehicle mileage. It is interesting to note that no one ever knew what, if any, use was made of the figures that Hank gathered.

There are two lessons to be learned from the saga of Hank. The

first is that technical data is written as a guide to perform a task. It does not provide foolproof instruction, nor is it intended as a replacement for common sense safety practices. There is nothing in the book that tells you not to hit your head while post loading an aircraft. Nowhere in tech data does it tell a weapons specialist not to stick his fingers between a bomb and a bomb rack. And there is certainly nothing in the book warning a technician about placing his or her foot in front of the wheels of a bomblift truck. Tech data is written under the assumption that the people who use it exercise a certain amount of caution and common sense.

The second lesson is perhaps the more important. Whether Hank's cloud of doom was the result of carelessness, complacency, or whether he was simply accident prone, his supervisor should have sent him to a job where he could have been more closely supervised. Instead, his boss invited the mishaps Hank caused by having him reassigned to a position where, unsupervised, he caused more than a million dollars in damage.

It is not uncommon for supervisors to hide people like Hank in positions where they are not seen. Unfortunately, these jobs, while less visible, are often critical to the mission. Supervising the EOR crew is a perfect example. The result of this kind of management is often a mishap or, at a minimum, it shows up in poor maintenance.

The successful supervisor understands that each human being is unique. Some are faster learners than others. Some are reliable — some are not. Some, like Hank, require more supervision than others.

In spite of the cloud of bad luck that seemed to follow him everywhere, Hank managed to put in his 20 and retire. I lost track of him until the other day when a friend told me that he heard Hank was in the hospital recovering from injuries he received in an unfortunate bowling accident. ■

THERE I WAS

■ As a command pilot, I learned why standard operating procedures need periodic review and, sometimes, revision. One morning, we were preparing our F-100s for a cross-country flight from Carswell AFB, Texas, to Kirtland AFB, New Mexico. We used cartridges for engine start, which was a quick way to get the flight ready to go. If a cartridge misfired, our procedure was to leave it in the starter breech and hook up an MA-1A external pneumatic power cart. This saved the 15-minute wait for cooling recommended by the Dash 1.

On this day, my cartridge didn't work, so rather than hold up the flight, I used an MA-1A to get started. We were soon ready to go and taxied out. Takeoff and departure were uneventful.

For the short flight to Kirtland AFB, we climbed to 26,000 feet in a spread formation. Leveling off, we set up 0.8 Mach cruise, and lead told me to move from the number 4, slot position, to the outside wing. I eased the throttles back and started to move aft when I noticed the rpm winding down through 50 percent. Then I heard it — a loud explosion from the back of my jet! The fire warning, flight system fail, and master caution lights were all brightly lit. I informed flight lead that I had just **flamed out!**

A wingman, flying just forward and to the left, felt the explosion. He moved back so he could watch me and radioed that I had what appeared to be large quantities of fuel coming out of a crack on the aircraft. I started a gentle left turn toward Reese AFB, Texas, which was 78 miles away and the nearest emergency landing field. It was very quiet as I established a 250-knot glide. My rpm was now reading zero.

I slowly advanced the throttle, but the engine invariably began to compressor stall. More warning lights illuminated, and the aircraft started a slow roll to the right. I corrected with left aileron and rudder which would only temporarily correct the problem.

The next radio call really caught my attention. There was a **60-foot flame** coming from my tail section! I applied left controls to level the aircraft before ejecting, but it was useless. The left rudder pedal moved freely to the full forward position without any aircraft response. The entire warning panel was now illuminated, ironically with the exception of the overheat light. All my controls were frozen. It was time to part company with this jet, and I ejected at 17,000 feet. Fortunately, that ride went smoothly.

Once free of the seat, it was a free-fall down to 14,000 feet, where the parachute opened as advertised. I completed the four-line cut and got a great view of part of west Texas. There was plenty of time to choose a landing spot, and I landed without injury.

As luck would have it, a real Texas cowboy saw me coming down and drove over in his pickup truck and helped me gather up all my gear. He took me to a small, nearby town where I enjoyed some great Texas hospitality. Later on, I met up with my flight at Reese.

As it turned out, the explosion came from the cartridge that had been left in the engine. In our rush to take off, we had disregarded the recommended Dash 1 procedure and lost a valuable asset.

As a result of that mishap, our operating procedure was changed. A misfired cartridge *must* be cooled for 15 minutes and removed before engine start. Sometimes standard operating procedures can be improved to find smarter and safer methods. Check six and happy landings! ■

THIS COULD HAPPEN TO YOU!!

To introduce this new regular feature, wherein we examine mishaps and analyze what happened and how, we begin with the first fatal mishap in aviation history. We hope you will learn valuable lessons from these unfortunate flights.

■ The U.S. military's first fatal aircraft mishap occurred on 17 September 1908 at Fort Myer, Virginia. First Lieutenant Thomas E. Selfridge, assigned to the First Field Artillery, was the passenger and Orville Wright was the pilot.

Orville Wright had installed longer propellers on his aircraft in preparation for an upcoming official speed trial. The new propellers were about 4 inches longer.

On the 2 previous days, the winds had been too high for a safe flight. But on 17 September, they were only 4 miles per hour, so final preparations were made for their test flight.

They took off from a field at Fort Myer and climbed to an altitude of approximately 200 feet. Then they circled the field four-and-a-half times. A clicking sound alerted Orville Wright of a pending problem. The longer propellers were hitting the supporting guy wire of the rear rudder. They decided to land before the problem worsened. Orville wanted to land then, but they were too close to the Arlington National Cemetery wall. So they completed a turn and headed for the upper field. Orville Wright started a descent and turned off the engine. The aircraft began an unexpected turn. He tried to gain aircraft control by moving both front and aft rudder controls.

The mishap occurred when the brittle propeller blade that had been striking the rear rudder's guy wire finally cut it, causing the rear rudder to collapse. This resulted in an unavoidable loss of aircraft control. The shattered propeller fluttered to the ground. The aircraft nosed over and fell quickly from an altitude of about 75 feet and crashed, hitting the ground on the left wing at a 45-degree angle and crushing the front rudder. Debris was scattered for 200 feet. The flight had lasted approximately 5 minutes.

"Combat capability is linked to the readiness of our weapon systems. Each mishap represents a reduction in these critical resources. The causes are ageless, yet recurring. As Air Force leaders and supervisors, we must meet this challenge to maintain the highest state of preparedness."

JAMES M. JOHNSTON III
Brigadier General, USAF
Director of Aerospace Safety

The cause of our first fatal mishap was an oversight in proper planning. The new propeller had cut the supporting guy wire.

Lt Selfridge died of head injuries and was buried with full military honors at nearby Arlington National Cemetery on 25 September 1908. Orville Wright, who was dazed from the mishap, survived with a few broken ribs, a broken thigh, and several facial cuts. He spent the next 6 weeks recovering in the Fort Myer hospital and went on to make aviation history for the next 32 years.

Aircraft damage sustained in the crash included a crushed left wing, front rudder, skids, gasoline tank, and engine water cooler.

As a result of this mishap, life support systems were born as pilots began wearing football-type helmets for protection.

This story illustrates how mishaps can be aggravated by materiel or logistics shortfalls. This problem spans the age of aviation and is a continuous challenge. Last year, 40 percent of the Air Force's Class A mishaps were related to logistics problems. This year, nearly 35 percent have been caused by logistics errors.

We have certainly come a long way and learned a great deal about support equipment and preventing mishaps since then. Unfortunately, in spite of great investments in time and technology, we still experience aircraft mishaps and fatalities. ■

Write A Dumb Caption Contest Thing

There's no way you people are going to continue to beat our dumb humor geniuses who've come up with another truly sensationally funny caption. Yeah, I know you've been able to top us every month so far, but you can't keep up with this killer pace. Of course, if you could, you'd win our fabulous and much revered little prize and be toasted throughout the free world as a true legend.

Write your captions on a slip of paper and tape it on a photocopy of this page. DO NOT SEND US THE MAGAZINE PAGE. Use "balloon" captions for each person in the photo or use a caption under the entire page. Entries will be judged by a panel of experts on humor on 8 Nov 89. All decisions are open to bribes.

Send your entires to: **"Dumb Caption Contest Thing" • *Flying Safety* Magazine • HQ AFISC/SEPP • Norton AFB CA 92409-7001**

IFC APPROACH

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

MY INSTRUMENT QUESTION IS:

MAJOR WILLIAM D. STANFORD
USAF Instrument Flight Center
Randolph AFB, TX

■ For the many pilots who recently took an instrument knowledge test as part of a study by the USAF Instrument Flight Center, here are the rest of the questions and answers. For those pilots who did not participate, test your own instrument knowledge by answering these questions.

1. Reference figure 1. You are inbound to WORRY at 3,000 feet MSL and are subsequently cleared for the TACAN RWY 17 approach. The earliest you may descend below 3,000 feet is:

   a. Once established on the 210° terminal routing from WORRY.

   b. Outbound abeam the Corpus Christi VORTAC.

   c. Once established on the 012° radial inbound to the Corpus Christi VORTAC.

   d. None of the above.

2. Reference figure 2. The MAP for the depicted localizer approach is located:

   a. 4.3 NM from the WESIE LOM.

   b. At the middle marker.

   c. 4.8 NM from the LOC FAF.

   d. Both b and c.

3. You have requested to fly the ILS RWY 13R approach to a field with parallel runways. ATC responds: "RAMBO 22, cleared for ILS runway 13 right, sidestep to runway 13 left." You should:

   a. Not accept the clearance because Air Force pilots cannot sidestep per se. Request to circle to runway 13 right and use published circling minimums.

   b. Accept the clearance and use the published circling minimums.

   c. Accept the clearance and use the published sidestep minimums.

   d. Accept the clearance and use the published localizer minimums.

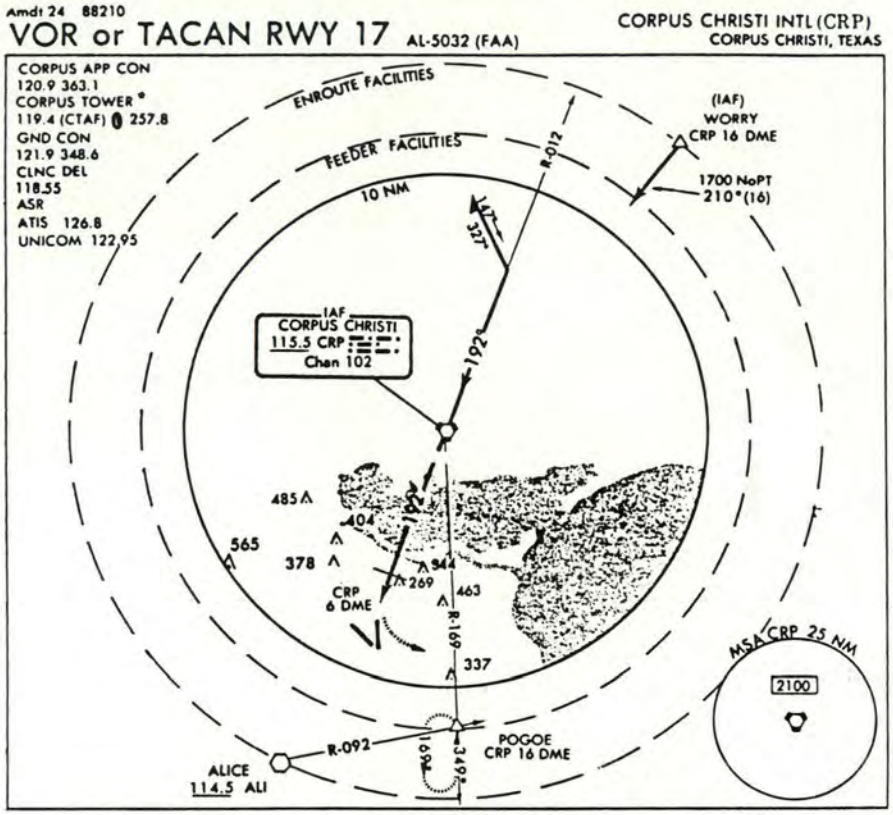


Figure 1.

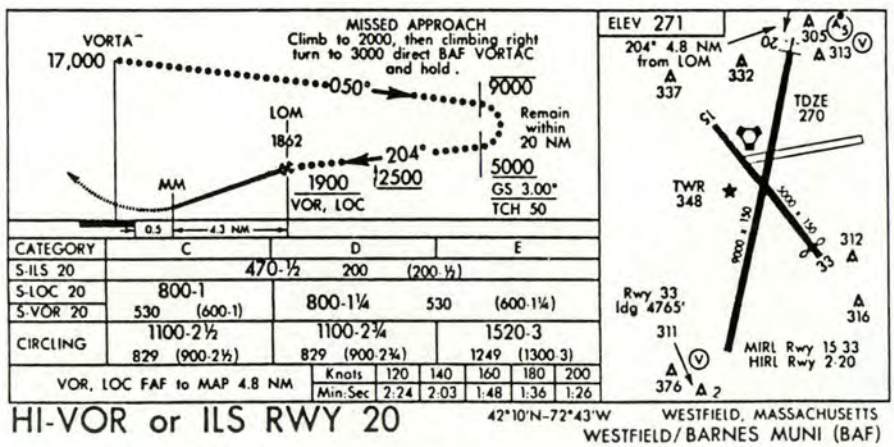


Figure 2.

continued

IFC APPROACH

Do you know what is necessary to execute a successful instrument departure? And do you know where to find information on making pilot weather reports? The answers to these questions, and more, presented for you here will help you successfully complete your mission.

continued from preceding page

4. When performing an instrument departure, unless otherwise instructed, climb to at least _____ feet above the airport elevation before initiating a turn.
   a. 200
   b. 400
   c. 500
   d. 1,000

5. An approach to Ronbo AFB is identified as the VOR/DME RWY 15. The slash means:
   a. Both VOR and DME are required to fly the approach from the IAF to the MAP.
   b. VOR and DME are required equipment to fly the entire approach (IAF through the published missed approach procedure).
   c. Either VOR/DME or TACAN is required to fly the entire approach procedure.
   d. DME equipment may be required to fly the final approach segment of the mission.

6. Which of the following statements about visual approaches is FALSE?
   a. Radar service is automatically terminated when you are told to contact tower.
   b. Acceptance of traffic information and instructions to follow another aircraft acknowledges the pilot's responsibility for wake turbulence separation.
   c. Unless otherwise instructed, you are expected to execute a straight-in approach.
   d. When instructed to follow another aircraft, ATC cannot clear you for a visual approach until you report seeing both the airfield and aircraft to follow.

7. Procedures for making pilot weather reports (PIREPS) can be found in:
   a. AFM 51-37, Instrument Flying
   b. AFM 51-12, Weather for Aircrews
   c. Flight Information Handbook (FIH)
   d. DD Form 175-1

8. You are planning an IFR departure from a civil airfield which has no published SID. The ► on the IAP indicates you should:
   a. Check for published takeoff weather minimums and comply with them if higher than command minimums.
   b. Disregard the symbol.
   c. Check for published IFR departure procedures.
   d. Request radar departure since no other IFR departures are available to you.

Sound instrument procedures are vital to safe flight operations, especially when you have a wingman who relies on your knowledge and judgment.

9. Instrument approach lights provide pilots with good vertical guidance during low visibility instrument approaches.
   a. True
   b. False

10. Flying a precision approach, the missed approach should be initiated when:
   a. Reaching published decision height (DH) and sufficient visual references are not available to you for landing.
   b. A safe landing is not possible.
   c. Instructed to do so by the controlling agency.
   d. All of the above.

11. On an ASR final approach, you:
   a. Should use a rate of descent that will ensure reaching the minimum descent altitude (MDA) prior to the missed approach point (MAP).
   b. Should plan to arrive at the MDA and MAP simultaneously.
   c. Should use a rate of descent that will ensure reaching the MDA in time to use a normal rate of descent to the runway after the runway is sighted.
   d. Both A & C

12. Facilities with 24-hour forecaster service can be found in the:
   a. Flight Information Handbook
   b. AFM 51-12, Weather for Aircrews
   c. IFR En Route Supplement
   d. Either A or C

my instrument question is: continued

ANSWERS

Question 1. Answer a. Reference AFM 51-37, paragraph 10-4c, General Planning (GP), page 2-17 TERMS. figure 1.

Once cleared for the approach, maintain the last assigned altitude and heading until established on a segment of the published terminal routing or IAP. "WORRY" is the IAF and a segment of the approach and, therefore, when established on that segment, you may descend below 3,000 feet. You should also remember that GP defines a "feeder route" as part of the instrument approach procedure.

Question 2. Answer c. Reference AFM 51-37, paragraph 15-1, a, figure 2.

To determine the location of the missed approach point (MAP), compare the distance from the FAF to MAP adjacent to the timing block. See figure 2.

Question 3. Answer c. Reference AFM 51-37, paragraph 14-7.

Where a sidestep procedure is published, aircraft may make an instrument approach to a runway or airport and then maneuver under visual conditions to land on an alternate runway specified in the procedure. The sidestep MDA will be maintained until reaching the point at which a normal descent to land on the sidestep runway can be successfully started.

Question 4. Answer b. Reference AFM 51-37, paragraph 8-6.

Whether it be a published instrument departure, a SID, or radar vectors, climb to at least 400 feet above the airport elevation before initiating a turn unless you are otherwise instructed.

Question 5. Answer d. Reference AFM 51-37, paragraph 7-6, a, (2), a.

Straight-in approaches are identified by the types of navigational aids which provide final approach guidance and the runway to which the final approach courses are aligned. A slash (/) indicates more than one type of equipment may be used to execute the final approach. Be aware that additional equipment may be required to execute the other portions of the procedure including the missed approach.

Question 6. Answer d. Reference AFM 51-37, paragraph 13-3.

ATC will not issue clearance for a visual approach until the pilot has the airport *or* the preceding aircraft in sight. If the pilot has the airport in sight but cannot see the preceding aircraft, ATC may still clear the aircraft for a visual approach; however, ATC retains both traffic separation and wake vortex separation responsibility.

Question 7. Answer c. Reference Flight Information Handbook (FIH), page C-33.

The PIREP format is:

1. Location of the phenomena
2. Time (UTC)
3. Altitude (MSL)
4. Type of aircraft
5. Skycover (bases, tops, and amount)
6. Air temperature
7. Wind
8. Turbulence
9. Icing
10. Remarks

Question 8. Answer c. Reference AFM 51-37, paragraph 7-4, c.

Instrument departure procedures have been established at many airports to assist the pilot in avoiding obstacles during departure. These procedures are published in the front of the Low Altitude FLIP Terminal Book. Airfields with departure procedures published will have the symbol ► depicted below the minima section on the IAP.

Question 9. Answer b. Reference AFM 51-37, paragraph 14-2, b.

Instrument approach lights *DO NOT* provide adequate vertical guidance to the pilot during low visibility instrument approaches. In poor visibility, especially when the runway surface is not visible or in good visibility at night, there simply are not enough visual cues available to adequately determine vertical position or vertical motion.

Question 10. Answer d. Reference AFM 51-37, paragraph 15-2, a.

Perform the missed approach when the missed approach point or decision height (DH) is reached and if a. the runway environment is not in sight (the runway threshold or approved lighting aids or other markings identifiable with the runway), b. you are unable to make a safe landing, c. you are so directed by the controlling agency.

Question 11. Answer d. Reference AFM 51-37, paragraph 13-2, e, (1), (c).

Arrive at the MDA with enough time and distance remaining to identify runway environment and descend from the MDA to touchdown at a rate normally used for a visual approach in your aircraft. CAUTION: Depending upon the location of the MAP, the descent from the MDA (once the runway environment is in sight) often will have to be initiated prior to reaching the MAP to execute a normal (approximately 3 degrees) descent to landing.

Question 12. Answer d. Reference Flight Information Handbook (FIH), page C-7, IFR En Route Supplement.

Facilities with 24-hour forecaster service can be found in the meteorological section of the FIH. They are also listed after the PSMV METRO frequency associated with a particular airport in the IFR En Route Supplement. ■

THE SOARING COSTS OF MISHAPS

LT COLONEL KENT D. KOSHKO
Editor

■ Mishaps are very expensive . . . prohibitively so!

They reduce our combat capability and have a detrimental effect on command and unit morale. Their cost is great, for they sap vital national assets — irreplaceable lives, a wealth of flying experience and expertise, in addition to costly weapon systems from our nation's first line of defense.

Computer space-age technology, coupled with aerospace industry advancements, have provided the Air Force with aircraft which, when compared with their predecessors of the last decade, are impressive.

Today we fly complex aircraft with more sophisticated systems capability in a much greater, more demanding environment than even a decade ago.

One C-5 Galaxy can carry 2½ times as much as a C-141 or eight times as that of a C-130.

The B-1 can carry three times the internal payload of the B-52.

And the F-16 is far superior to the older F-4.

Yet, while the number of mishaps and aircraft destroyed has dropped significantly over the past 42 years, the total cost of those crashes has risen dramatically (figure 1).

In 1947, our first year as a separate service, the Air Force lost 1,555 aircraft at a cost of $20 million, or over $12,800 per mishap. In FY89, at the time of publication, 52 aircraft have been involved in Class A mishaps at a cost of over $887 million! This equates to an average of more than $17 million for each aircraft. Figure 1 shows that since 1962, the cost for destroyed aircraft has climbed significantly until the end of the Vietnam conflict and rose again, beginning in 1978.

Figure 2 illustrates the dramatic rise in dollar loss in Class A mishaps since 1976 . . . nearly five times the cost in just 14 years!

In 1947, the Air Force's first budget was $1.4 billion. For FY89, our budget was $97.5 billion.

The statistics in figures 1 and 2 suggest the US Air Force safety programs have resulted in improvements in reducing previous mishap trends. You have come a long way with innovative safety ideas. Unfortunately, there is still much to be accomplished.

It is incumbent upon us to maintain and operate these complex space-age machines with the greatest of care and in the most mishap-free environment possible. We certainly cannot afford to do otherwise. ■

Figure 1.

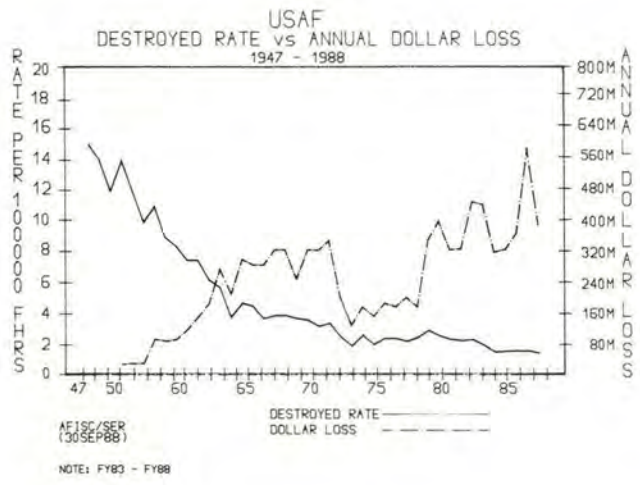


Figure 2.

WHAT'S WRONG IN THIS PHOTO?

REMEMBER, SAFETY IS EVERYONE'S BUSINESS!!

The answer is on page 26

AIR FORCE AWARDS PROGRAM

AVIATOR VALOR AWARD

Col Roger L. Grimsley

67th Tactical Reconnaissance Wing
Bergstrom AFB, Texas

Colonel Grimsley was selected for performing a conspicuous act of valor during an aerial flight in April 1988. While flying a routine RF-4C training mission, the 67th Tactical Reconnaissance Wing's Deputy Commander for Operations and his weapon systems officer felt two explosions and saw that both engines were on fire.

Making the decision to keep the plane airborne long enough to avoid populated areas, the colonel ordered a bailout with seconds to spare before the aircraft hit the ground. His decision saved many lives.

CHENEY AWARD

TSgt William A. Wray

436th Military Airlift Wing
Dover AFB, Delaware

The Cheney Award is presented to an individual who performs an act of valor, extreme fortitude, or self-sacrifice in a humanitarian interest performed in connection with an aircraft. In April 1988, Sergeant Wray, a C-5A flight engineer, was performing ground duties before takeoff from Islamabad, Pakistan, when he noticed a fire in his aircraft's landing gear area. Quick thinking by Sergeant Wray saved the aircraft and many lives when he single-handedly kept the fire under control using Halon® fire extinguishers until firefighters arrived.

MACKAY TROPHY

C-5 Crew

436th Military Airlift Wing
Dover AFB, Delaware

Conducting the most meritorious flight of the year earned the Mackay Trophy for a 436 MAW crew. The crew's April 1988 flight to the Soviet Union was part of the agreement made by former President Ronald Reagan and General Secretary Mikhail Gorbachev during the December 1987 Summit.

Flying out of Rhein Main AB, West Germany, the crew carried highly sensitive Department of Energy equipment to monitor Soviet nuclear testing. Under the restriction as flying around a politically sensitive area, the crew used its training and experience to make the mission a success.

The crew were Capt Michael L. Eastman, Maj John L. Cirafici, Capt James C. Runk, Capt Kelly J. Scott, SMS Arthur Vogt, MSgt Robert L. Downs, MSgt Charles W. Finnegan, MSgt James P. Maurer, MSgt William J. Tobler, TSgt William G. Nunn, Jr., SSgt Timothy L. Hahn, Sgt Andrew Benucci, Jr., and Sgt Thomas W. Siler.

General Thomas D. White USAF SPACE TROPHY

Dr Robert R. Barthelemy

Aeronautical Systems Division
Wright-Patterson AFB, Ohio

The Space Trophy signifies outstanding contributions to the nation's aerospace progress during the previous calendar year. Dr Barthelemy is the Air Force System Command's Senior Civilian Program Director for the National Aerospace Plane Joint Program Office. He was responsible for the direction and management of a national program to develop, build, test, and acquire hypersonic aircraft and aerospace planes for military, civil, and commercial applications.

His leadership and guidance of the program has kept it in the light of Congress and many key people. His integration of other offices and recruiting of many new scientists has made the program a high-performance effort and a great achievement.

AVIATION HERITAGE

Pride in the Past . . . Trust in the Future

SEPTEMBER

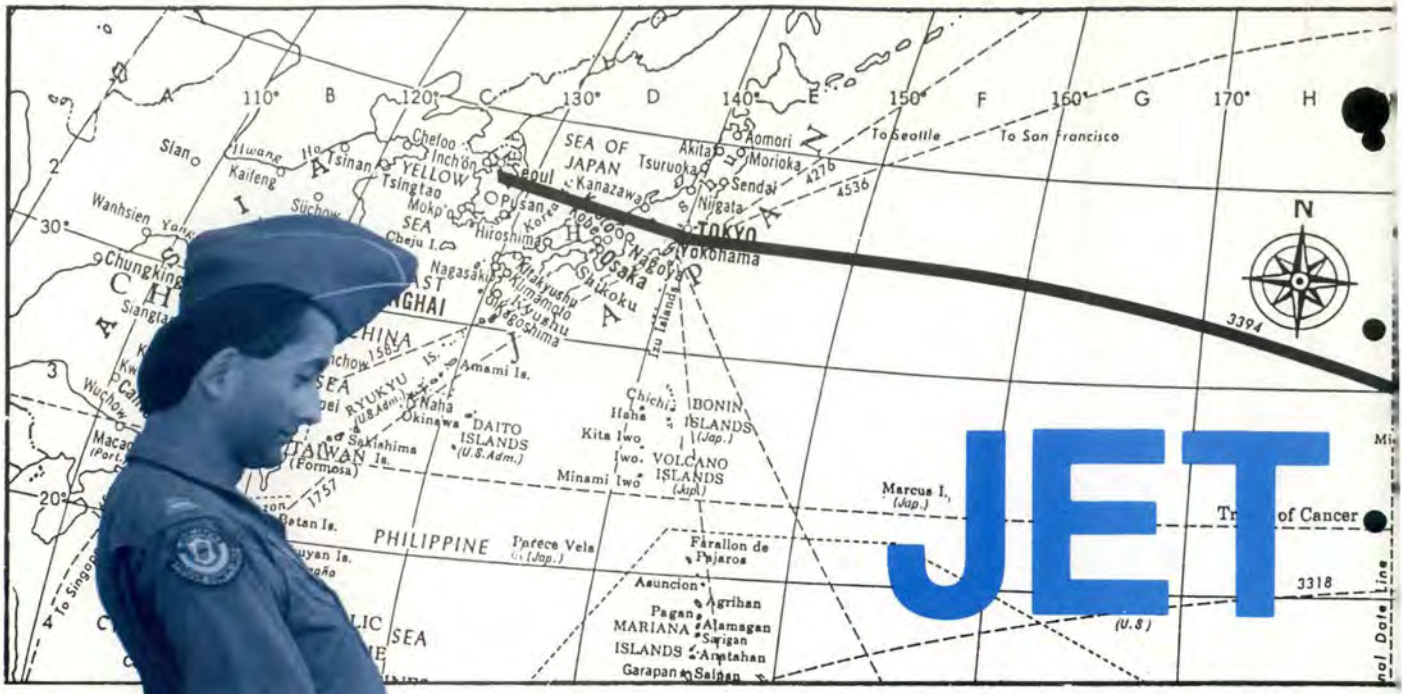
America has a rich heritage of aviation firsts, thanks to the foresight, perseverance, and sacrifice of countless dedicated men and women.

In September, we are proud to salute the anniversaries of these bold pioneers:

10th	1971	Air Force Museum dedicated at Wright-Patterson AFB, Ohio.
13th	1974	Captain (now Brigadier General) Harold "Buck" Adams, pilot, and Major William C. Machorek, WSO, set a world speed record flying from London to Los Angeles in the SR-71 Blackbird . . . 1,435.59 mph as they completed the flight in just 3 hours, 47 minutes, and 39 seconds!
17th	1908	The first military aircraft fatality occurred at Fort Myer, Virginia, when Orville Wright crashed with First Lieutenant Tom Selfridge aboard. Lt Selfridge was a fatality.
18th	1947	USAF became a separate service.
24th	1929	James H. Doolittle made the first totally "blind" instrument takeoff and landing.
25th	1947	General Carl Spaatz was appointed the first Air Force Chief of Staff.

"No job is so important, no task so urgent that we cannot take time to perform our work safely."
Brigadier General G. M. Reay, Commander
1st Canadian Brigade Group, Calgary

These aviation leaders and events have helped shape our service into the greatest Air Force in the world.



If you have flown thousands of miles from home base and feel like the reflection in a fun-house mirror, . . . then understand and guard against the effects of jet lag.

LT COLONEL SAMUEL STRAUSS
Medical Corps
Flight Surgeon

■ Much of today's military flying is done in an environment of long workdays, irregular work hours, and travel to distant locations. Many mission schedules plan several consecutive days of such flying. In addition to following crew rest directives, it is important for the aircrews to understand and compensate for the effects of jet lag.

Understanding Jet Lag

A major contributor to the stress of military flying on crews is that of completing a mission in a time zone different from that in which it departed. Research into the physiological and psychological effects of the resulting "circadian dysrhythmia" suggests that the effects, although temporary, may be serious and could affect the safe operation of our aircraft.

The circadian rhythm is a 24-hour cyclic variation of our psychologic and physiologic functioning. It is influenced by hormones secreted by the pituitary gland under the brain and our "chronotype." Our chronotype characterizes us as a "morning person" or a "night person."

The circadian rhythm actually consists of several separate rhythms, such as sleep-wake cycles, hunger and digestion, and body temperature. These are synchronized by day-night cycles and social interaction patterns. Each of these rhythms synchronize at their own rates.

When the rhythms are disturbed, as occurs when traveling across several time zones, the resulting changes affect the way we feel and function. Psychological effects, such as mood dysfunction, usually resolve rapidly. However, physiological functions, such as sleep-wake cycle, food digestion, control of body temperature, heart rate, renal function, hormone levels, alertness, and fatigue can take several days to fully adjust. Some common complaints of jet lag sufferers are difficulty falling asleep, difficulty staying asleep, difficulty staying awake on the job, and generalized gastric discomfort.

Of the transmeridian flights, some studies suggest the most stressful are those in the west-to-east direction. This is due to the effect of "lost time" when comparing local time to lapsed time. When traveling westward, essentially pacing the earth's rotation, local time at arrival is often not much different from departure time. Therefore, the

You can minimize the effects of jet lag by the use of several precautionary measures.

We often travel across many time zones in a single mission.

effect on circadian rhythms may not be as dramatic.

Complete recovery may require as much as 1 day per time zone. But the actual recovery time depends mostly on the number of time zones crossed, the direction of travel, and individual variability.

Minimizing Jet Lag's Effects

The effects of jet lag can be reduced by taking several measures to minimize its effects. One to consider is a gradual alteration of sleep-wake cycles to approximate the time at destination. If possible, this should be started several days prior to the trip. Some studies have shown that to equalize sleep balance, naps are helpful in improving alertness and performance.

Another measure shown to be helpful is a diet change starting 4 days before the flight. This would consist of high protein meals on days 1 and 3, and light meals on days 2 and 4. Timed use of caffeinated beverages can supplement the need for mild stimulation when necessary.

In some military situations, a sleeping medication, temazepam, has been used with great success. The safety and effectiveness of this drug taken by military aircrews was demonstrated by the Royal Air Force of the United Kingdom in the Falkland Islands War. During these operations, some flights extended to 30 hours.

Aircrews were able to sleep at unusual times using temazepam. They returned to flying duties 6 hours after taking this medication with no reported decrement in flying or fighting performance.

Please note that RAF temazepam is different from the Air Force's drug. The RAF temazepam has a much shorter life span in the body. The variety available to our aircrews — Restonil — lasts 9-12 hours, whereas the RAF drug lasts 4-5 hours. We must also emphasize these were highly controlled tests and under very extreme conditions. The drug is *not* for routine use.

In September 1987, the USAF Surgeon General authorized the use of temazepam as a sleeping pill for aircrews under special operational conditions, with approval of their flight surgeon.

A Positive Approach

For all of us who fly, jet lag can interfere with optimal effectiveness on trips. With some of these ideas in mind, thoughtful flight scheduling, planning, and a few preventive measures can make these flights safer and more enjoyable. ■

FSO'S CORNER

Personal experience stories for SAFETY AWARENESS

CAPTAIN DALE T. PIERCE
919th Special Operations Group
Duke Field, Florida

■ The other day, I got a call from the Commander of the 93d Air Refueling Squadron (AREFS) at Castle AFB, California. He told me he really likes the way the Navy's *Approach* magazine uses a lot of there-I-was material. He believes, as I do, that the line fliers pay a lot of attention to real-life experience material. He explained that both the writers and readers obtain benefit from there-I-was stories. The writers get to rethink the episode, and the readers get an opportunity to learn from someone else's mistake.

He said he was curious how they obtained all that material for *Approach* magazine, so he called the office of the Chief of Naval Aviation and asked. He was told the Navy holds a command-sponsored safety day, at least annually. On this day, all fliers are required to write a there-I-was story. It doesn't have to be a literary masterpiece. It doesn't even have to be signed. It just has to be a personal experience written understandably. Using this technique, the Chief of Naval Operations gets literally hundreds of there-I-was stories to pick from for use in *Approach*.

The 93 AREFS commander decided a similar brand of command support for safety in his unit might bring similar results. However, instead of sequestering all his fliers, he decided to try using his instructor teams. He worked it like this.

One day, he required each of his instructor teams (consisting of several fliers) to come up with one there-I-was story by close of business. To allow them to avoid embarrassment, he gave them the option of sanitizing the story. "After all," he explained, "the only difference between a fairy tale and a war story is that the fairy tale starts with 'Once upon a time . . .' and a war story starts with 'No ____, there I was . . . .'"

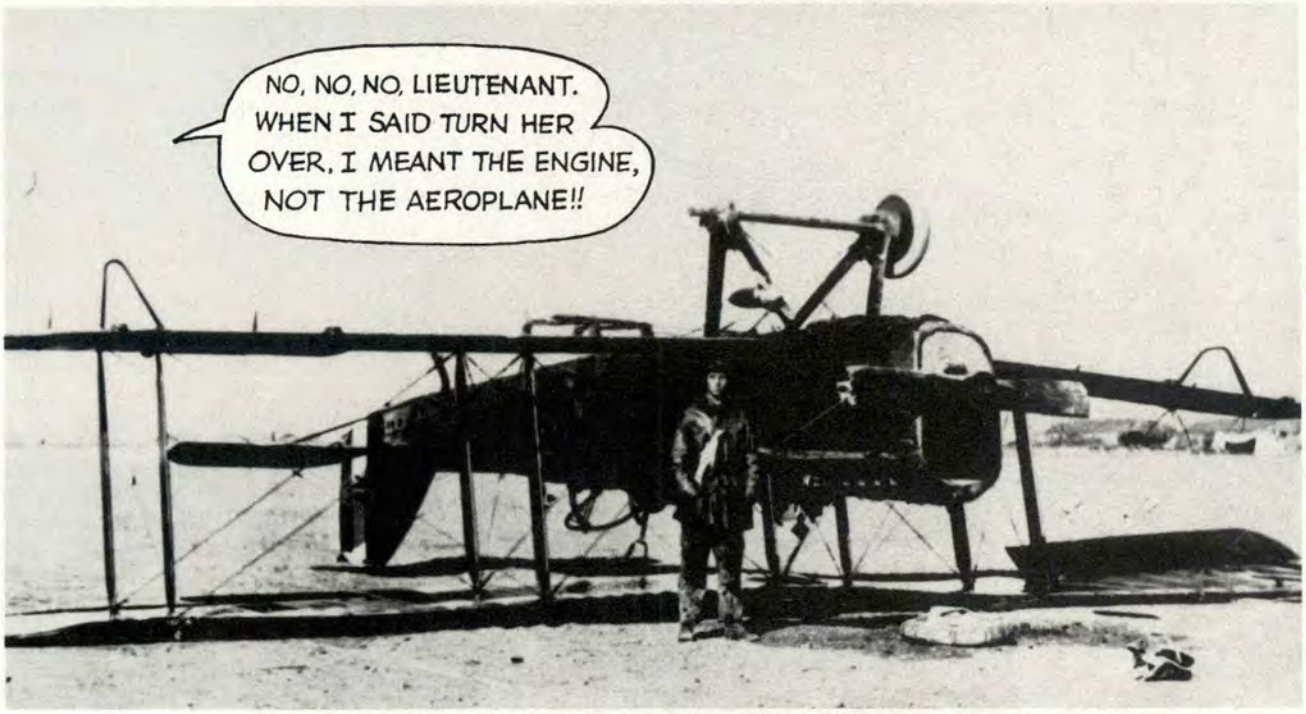
He said each team easily came up with one story, and that he uses the there-I-was stories from his instructor teams to create interest in the unit safety newsletter. After all, who can stop reading an article that starts with, "No ____, there I was . . . ."

An additional benefit is that it affords unit commanders the opportunity to show command support for his safety program in a tangible and visible way — a real plus for the safety program, not to mention at MEI and UEI time.

What are you doing in your program that could help other FSOs if they knew about it? If you know of something, call me (Dale Pierce) at AUTOVON 872-2012 (USAFTAWC), or send a short note to 919 SOG/SEF, Duke Field, Florida 32542-6005. ■

Editor: We reached a similar conclusion and have increased the "THERE-I-WAS" articles and added more real life stories.

Once Again, Thanks For Your Support!



. . . AND THE WINNER FOR THE MAY 1989 DUMB CAPTION CONTEST IS:

Sgt A. Witherspoon
5th Tactical Air Control Group
Osan AB, Republic of Korea

All of us at *Flying Safety* magazine can hardly wait to receive the mail and read your latest submissions to our Dumb Caption Contest Thing! They are super, and you are all very clever. But . . . there has to be one winner! As difficult as it always is, we finally chose Sgt A. Witherspoon. Congratulations! Your little prize is in the mail. We really do thank you and all the entrants for the great captions. Nice job.

The next 10 most popular captions are listed below in the honorable mention category. It appears you are having as much fun with this contest as we are. Keep those cards and letters coming!

Honorable Mentions:

1. **Does this mean I hooked my check ride?**
   Major Howard Creek, 82 FMS/CC, Williams AFB, Arizona
2. **How did what happen?**
   SSgt Henry R. Harlow, Rickenbacker ANGB, Ohio
3. **Hmm . . . Let's see now, how can I blame this on the nav??**
   Lt Col Jim McLaughlin, 338 CCTS/CFIC, Dyess AFB, Texas
4. **I'm fine . . . but I'm not so sure about the wing walker!**
   SMSgt Michael Cassady, 216 Betty Rd., Pensacola, Florida
5. **Nice run, GCA.**
   CMSgt Pete Pelletreau, 1972 Comm Gp/ATR, Eglin AFB, Florida
6. **Quick! Someone find out if this thing is still under warranty!**
   MSgt James D. Stanley, 443 MAW/MACI, Altus AFB, Oklahoma
7. **Well, did I earn my wings or not?**
   A1C Lezlie S. Ryan, 67 TRW/MAEK, Bergstrom AFB, Texas
8. **Low-observables aircraft technology demonstrator.**
   TSgt Scott Watson, 6515 AMS/MAAMIS, Edwards AFB, California
9. **You think the landing was rough!? Wait until we try to take off again!!**
   Captain Jeff Follett, 186 TRG/DE, Mississippi ANG, Meridian, Mississippi
10. **Well, the Dash One said when an asymmetrical landing gear condition exists to land with the gear up!!**
    TSgt John Furge, 122 CAMS (IN ANG), Ft Wayne MAP, Indiana

SURVIVAL ON THE RACK

CMSGT ROBERT T. HOLRITZ
Technical Editor

■ Proper washing is an essential step in an effective aircraft corrosion control program. Unfortunately, washing a military aircraft is not as simple as washing the family car. It requires special techniques and a variety of exotic chemicals to remove the soils that accumulate on modern aircraft. While these chemicals are extremely effective, they are a potential hazard for the maintainer. These hazards include fire and explosions, burns, toxicity, and skin diseases. Fortunately, fire and explosion at a wash rack are a fairly uncommon occurrence, but they do happen.

An Uncommon Occurrence

A temporary aircraft wash team member disposed of a small amount of chromic oxide in a disposable material barrel. After only a few grains of the material made contact with the paint and methol ethol keyton (MEK) mixture in the barrel, a fire started, and flames shot out violently from the funnel. Luckily, the fire was quickly extinguished. The airman learned, almost tragically, that chromic oxide should never come into contact with organic materials.

The Major Problem

Most effects of exposure to chemicals commonly used during aircraft washing and corrosion treatment come in the form of dermatitis. Dermatitis is a broad term for a wide variety of skin diseases. There are two general types of dermatitis: Irritation and sensitization.

Irritation usually occurs as the result of a brief exposure to strong concentrations of a chemical agent or a prolonged exposure to relatively low levels of an irritant.

On the other hand, sensitization

Is it really important to wear all the prescribed protective clothing just to scrub down an aircraft? Check it out!!

dermatitis occurs as a result of an allergic reaction from exposure to a certain chemical. The length of exposure required for sensitivity to take place varies from a few days to a year. Typically, however, most cases are established between a week and a month, depending on the person and the chemical.

There are many causes of dermatitis. The major ones that affect people who wash aircraft are those caused by detergents and solvents.

Detergents (which include soaps and alkalis) attack the oils of the skin and increase the skin's susceptibility to reactions of agents which would ordinarily not affect it. Solvents, however, break down the basic components of the skin.

The Best Prevention

The best way to prevent dermatitis is to wear full protective gear. TO 1-1-1, Cleaning of Aerospace Equipment, requires everyone involved with washing aircraft to wear rubber gloves, wet weather gear (including the hood), and some form of waterproof footware.

It is important to note that not only must this gear be worn, but it must also be donned properly. One airman found this out the hard way when he was tasked to wash the wheel well area of a C-130. Local procedures required the rubber gloves to be worn outside the wet weather suit. However, the airman was not aware of this requirement and wore the gloves inside the cuffs of the suit. When he reached above his head to scrub the wheel well area, the soap ran down the inside of his sleeve and down the right side of his body. He was unaware of this until about 2 hours later when he felt a burning sensation. Shortly after, he was admitted to the hospital suffering from *severe chemical burns*.

A second important point to remember is that nearly all chemicals used at Air Force wash racks will irritate the eyes. In fact, many of the reported wash rack incidents involving chemicals are related to eye irritation. In almost every one of this type of mishap, the injury could have been prevented by the use of approved goggles. While face shields afford some protection, they are not suitable for use on the wash rack. This is because chemicals can easily enter the face shield from behind.

However, not all goggles provide adequate protection. There have been many cases where people received severe eye injuries because they wore vented goggles. These goggles are designed to protect the eyes from flying particles, such as chips of metal, and do not provide eye protection against fluids or vapors. Goggles that conform to American National Standard Institute (ANSI) Specification Z87.1 provide the best protection. Goggles that conform to this standard are marked by the manufacturer with Z87.1. As with the wet weather gear, even the correct type of goggles will not protect you unless they are correctly worn and serviceable. It is also necessary to rinse your face prior to removing the goggles to prevent chemicals from running down your forehead and into your eyes.

Other Prevention Tips

It is common for units to assign people to wash rack duty on a temporary basis. Because these people are not familiar with the precautions and procedures for washing aircraft, a comprehensive briefing needs to be given to them. As a minimum, they should explain the basic procedures for washing aircraft, the hazards of the chemicals with which they will be working, and the proper use of safety gear. It should also cover emergency procedures. The supervisor should physically show the person the exact location of the eye and face wash equipment.

It is a good idea to take a long, hot shower immediately after working on the wash rack. This will help prevent skin and eye irritation from agents that may have come in contact with your skin and lessen the chance of becoming sensitized by chemicals.

One final note. Contact lenses should never be worn when working with, or even around, hazardous chemicals. There is a good possibility the chemicals could find their way between the lens and the cornea, causing painful irritation and even blindness.

The basic rules for working on the wash rack are contained in TO 1-1-1 and AFOSH Std 127-31, Personal Protective Equipment. Read them. Follow their guidance, and you will survive on the rack. ■

What's new in the NOTAM world?

Everything!

MAJOR JIM KEPHART
Chief, NOTAM Division
USAF Instrument Flight Center
Randolph AFB, Texas

To ensure they have received the latest airfield information, aircrews must read both the special notices and the hourly NOTAM updates.

Getting Started

■ For the past 2 years, the DOD NOTAM system has experienced extensive changes. In an attempt to save money and increase the accuracy and efficiency of a system plagued by outdated equipment and grease pencil technology, the DOD NOTAM system is being computerized and integrated with the FAA NOTAM system.

Since the NOTAM system became automated on 21 June 1989, there have been many questions from aircrews, most of which center around changes in the format. One rather cryptic comment advised the IFC: "Please don't tell us that's the way the FAA does it — B.S." Unfortunately, B.S. in this case did not stand for the author's initials. Rest assured, we do realize the new system is different and, through articles like this, we hope to show the aircrew member in the field that the system is easier to use, and by virtue of its real-time capability, is more accurate and efficient.

"Q" Codes

Through the use of "Q" codes, NOTAM events can now be automatically printed and delivered to the appropriate aircrews. These "Q" codes describe the majority of NOTAM events, and a description of their use can be found both in the Flight Information Handbook and in AFR 55-16, The Military Notice to Airmen (NOTAM) System.

However, the aircrew member should normally not need the Flight Information Handbook to define the "Q" code — the code will always be followed by the clear text translation under the E) field in the NOTAM. Due to a problem in software formulation, the "Q" code inadvertently appeared on the final product. It serves no useful purpose to the aircrew member, except to confuse him. Within the next 90 days, it should disappear from NOTAM text.

The NOTAM format is now divided by computer fields — A), B), C), etc. — which give the user clear definition of airbase (A), event start date (B), end date (C), time of event (D, if applicable), clear text description of the event (E), and upper/lower limits of activity (F, G, if applicable). Every NOTAM summary published contains a clear explanation of the meaning of each computer field in the newly formatted NOTAM product. A brief explanation of the content of each area of the new NOTAM format is shown below:

Consolidating NOTAM Into AWDS

The consolidation of FAA and DOD NOTAM systems was the first phase in reworking the old system. Phase II will incorporate NOTAM service into the new Automatic

KSAW K.I. SAWYER

	mo	day	hr	min		mo	day	hr	min
B) Start Date/time	mm	dd	hh	mm	C) End Date/time	mm	dd	hh	mm
	07	22	13	00		07	24	13	30

	hr	min/hr	min	
D) Time Effective	HH	mm/hh	mm	E) Clear Text (Uncoded)
		1300/1330		VORTAC CH110 NOT AVBL

Weather Distribution System (AWDS). AWDS will allow the aircrew member to call up NOTAM and weather information from computer terminals located in the squadron, base operations, or other locally selected areas. The new system will virtually eliminate the need for paper products hanging on the wall at base operations and give the aircrew member real-time accessibility to flight planning information from the convenience of the squadron work area. The first AWDS computer terminals are scheduled for McGuire AFB and Griffiss AFB in the spring of 1990, with installation at the rate of two per month at selected bases to follow.

In the meantime, the USAF IFC continues to wring out some of the problems of a newly automated system. Training is progressing with civilian FAA NOTAM specialists, introducing them to the differences between civilian and military NOTAM material. This will greatly reduce the amount of nonessential, incorrect, and repeat information currently produced. Also, to properly use the power of the new computerized system, worldwide education of airfield management specialists is being conducted, and international NOTAM authorities in DOD host countries are coordinated with on a daily basis.

As a result, the Air Force Central NOTAM Facility (AFCNF) at Carswell AFB, Texas, was closed at an expected saving of approximately $1 million a year. Prior to closure, the AFCNF employed 55 people.

Management authority for the new DOD NOTAM system now resides at the USAF Instrument Flight Center (IFC), Randolph AFB, Texas. However, since integration with the FAA NOTAM system was also a goal, the day-to-day running of the combined NOTAM system is done at FAA Headquarters in Washington DC. The IFC has established an operating location (OL) at FAA to facilitate automation and to solve field problems as they occur.

The Washington DC OL is comprised of three military coordinators (Army, Navy, and Air Force) and nine DOD-funded civilian FAA NOTAM specialists. These specialists perform editing, addition, and deletion functions for both CONUS and foreign NOTAMs which, for one reason or another, have not automatically entered the US NOTAM system.

In addition to the Washington DC OL, the IFC has established OLs at Frankfurt, Germany; Yokota, Japan; and St Louis, Missouri. The OLs in Germany and Japan have a staff of NOTAM specialists to support USAFE and PACAF theaters. The OL in St Louis is collocated at the Defense Mapping Agency Aerospace Center (DMAAC) and is manned by two civilian NOTAM specialists who provide the interface between host countries and the US NOTAM system. Phone numbers and a brief description of the responsibilities of each IFC OL can be found in FLIP General Planning, Chapter 5.

NOTAM SUMMARY EXAMPLE

```
1811NOTM 03 KDZZ 011800
NAMSUM 0601
VALID UPON RECEIPT THRU EXPIRATION OF UPDATE 23

SPECIAL NOTICES:
ATTENTION
  ATTN B)WIE  C) UFN  E)QXXXX AIRCREWS AND BASE OPERATIONS
PERSONNEL.  THIS IS A NEW COMPUTER GENERATED NOTAM PRODUCT.
MINOR CHANGES IN FORMAT ARE EXPLAINED BELOW:  AFTER THE LOCATION
IDENTIFIER AND NAME, THE NOTAM INFORMATION IS DISPLAYED IN
LETTERED FIELDS, I.E., B) C) D) E) AND F).  B) IS THE START TIME
OR WIE (WITH IMMEDIATE EFFECT).  C) IS THE ENDING TIME OR UFN
(UNTIL FURTHER NOTICE).  D) SHOWS THE DAYS AND/OR TIMES WHICH
ARE EFFECTIVE SUCH AS 0800/1200 WKD OR 0800/1200 MONDAY FRIDAY.
E) IS THE NOTAM TEXT OR CONDITION.  F) IS THE LOWER AIRSPACE
LIMIT.  G) IS THE UPPER LIMIT OF AIRSPACE.  CANCELLED NOTAMS
APPEAR WITH A PORTION OF THE TEXT FOLLOWED BY... CNL..., OR
...CNLD.

     NEW YORK

(1)  KSIP  LONG ISLAND MACARTHUR  6/24 CLSD 06021100/06021300

(2)  KPBG  PLATTSBURGH AFB
       B)  WIE  C) UFN  E) QLAAU 17 APCH LGT NOT AVBL
       B)  WIE  C) UFN  E) QNNAU TACAN NOT AVBL
       B)  WIE  C) UFN  E) QCACH TWR CHANGE  DLT 126.2 ADD 126.3

     KRME  GRIFFISS AFB
       B)  WIE  C)  UFN  E)  QLFAU  15 SFL NOT AVBL
       B)  WIE  C)  06101345  E)  QXXAU  ASR/PAR NOT AVBL
       B)  WIE  C)  06081500  E)  QMHAU  RWY ARST GEAR NOT AVBL

     KSYR SYRACUSE HANCOCK INTL  28 ILS GS OTS
```

(1) Civil NOTAMs remain in the old format. FAA will be upgrading to the ICAO format within the next 2 years.

(2) DOD NOTAM for Plattsburgh AFB, printed in ICAO standard format. Note the Q--- code in field E), followed by the clear text explanation. The Q--- code, which now appears due to a problem in software formulation, will be removed from the NOTAM product in the near future.

NOTE: The SPECIAL NOTICE Section of the summary will always contain an explanation of how to read NOTAM products.

Shown here is an example of the NOTAM summary. Notice the difference between the ICAO standard format and the FAA civil format.

The Goal

The ultimate goal of the new NOTAM system is to provide the aircrew member with timely and accurate information. Although the format is different from the old system, aircrews should see a noticeable increase in real-time information and readability over the next few months.

If you have suggestions or comments for improving the NOTAM system, please contact the USAF Instrument Flight Center/NOTAM Division, located at Randolph AFB, Texas 78150, or call us at AUTOVON 487-5071. We exist for your safety and convenience. ■

THERE I WAS

■ I've got 2,100 hours in the A-10, and I learn something new each time I fly her.

The squadron was surging, and after landing from my first mission, I went through dearm as I had a hung BDU (practice bomb). After the dearm crew safed the BDU, I taxied to a parking spot to let the load crews download the bomb.

After shutting down the engines, I started to climb out. I felt a tug on my left leg. Lessons learned from childhood taught me that before pulling hard because something doesn't give way — look at it first. My left leg G-suit pocket had caught the left ejection handle, and I had not safed the seat! The reason it had caught my leg is my (former, now) habit pattern was to stow my wallet in my left G-suit pocket. It had caught the ejection handle!

A couple of lessons learned and relearned: I'll do a thorough after-landing check each time, even though it's a quick turn. Second — I'm not putting anything in my G-suit pockets that isn't flat. Wallet, glasses case, etc., are out of there. And lastly, when something tugs on you, look before pulling. That tug may be trying to tell you something very important. ■

Let us tell your story in . . .

THERE I WAS

"There I Was" is a popular feature. You have some great stories that are just waiting to be told, so how about jotting them down. You may obtain the printed forms from your safety office.

This is an **anonymous program.** The inputs will receive the immediate personal attention of the Editor of *Flying Safety*. You can write to us at HQ AFISC/SEPP, Norton AFB, California 92409-7001, or call AUTOVON 876-2633/2634 for additional forms. By the way, if you don't have a form, just send your story.

Re-INTRODUCING THE FOD-FATHER

and his war on the FOD MONSTER

■ If FODfather looks familiar to some of the older maintainers, it is because he was a regular contributor to *Maintenance* magazine before it combined with *Flying Safety* magazine a few years back.

Along with the high cost of engines and airframes, the cost of each FOD incident has risen dramatically in the past few years. In fact, last year FOD cost the Air Force more than $50 million. In view of this, we have called the FODfather out of retirement to help the Air Force in the fight against that costly and unnecessary villain . . . FOD. In future issues, watch for FODfather's comments on recent FOD mishaps and some innovative methods the people in the field come up with to fight FODfather's arch enemy, the FOD monster. FODfather is a good listener, so send him your comments and FOD-fighting ideas.

Phantom FOD

While cruising at 11,000 feet, a violent compressor stall occurred in the Phantom's left engine. The pilot immediately pulled the engine back to idle and made an uneventful return to base. During a postflight inspection, maintenance people found severe FOD damage to the aircraft's no. 1 engine.

The engine was removed, and during tear-down inspection, impact marks from a threaded object were found on the compressor blades. While no screws or hardware were missing, investigation revealed that on the night prior to the mishap, maintenance was performed on the left vari-ramp. During the maintenance, one of the ramp's louver panels was removed and reinstalled, and several screws were replaced with new ones. Comparison of the replacement-type screw indicated it was a good match with the marks on the compressor blades.

Further investigation indicated this incident may not have occurred had maintenance followed established procedures. An examination of the aircraft forms revealed the installation of the louver panel was not properly documented in that only the "Inspected by" block was signed off, indicating the required inprocess inspection may not have been performed. In addition, in spite of the documentation discrepancy, a supervisor signed off the exceptional release clearing the aircraft for flight.

The cost of not following procedures and technical directives can be high. In this case, the cost of repairing the J79 engine was nearly $30,000. It could have caused the loss of an aircraft or, even worse, an aircrew. ■

Strict control of tools and hardware is an absolute must when working in or around the phantom's vari-ramps. Loose hardware in the vari-ramp area is a major source of engine FOD.

MAINTENANCE MATTERS

Tail Number Turmoil

■ During a surge exercise, a Phantom aborted on takeoff roll because of a canopy unlock problem. When the aircraft returned to the chocks, the crew was met by technicians. They discussed the problem and made a detailed entry in the aircraft forms. This was the last day of the exercise and, after 3 days of surging F-4s, the fully mission capable (FMC) rate was lower than at the start of the exercise.

With many hard broke jets, the maintenance folks stayed on 12-hour shifts through the night. The next morning at shift change, the night shift production super briefed the day shift super on the status of the fleet. It was then they realized the canopy writeup was entered in the wrong set of forms.

The alarming part of this dilemma was that the aircraft with the canopy problem had been launched on a cross-country mission an hour earlier. The crew was notified in flight and, fortunately, made an uneventful landing at an alternate base.

The result of this mixup could have been the loss of a canopy or an aircraft. As it was, it cost the squadron a week of down time for the jet and several thousand dollars in TDY pay to send specialists and equipment to fix the airplane.

In a similar error, tragedy was narrowly avoided. A midshift servicing crew was dispatched to defuel an aircraft in preparation for replacing a fuel system valve. Although the forms were not at the aircraft when they arrived at the jet, they proceeded with the defuel operation to complete the job before shift change. The supervisor found the forms in the flight chief's office and made the appropriate entries.

After shift change, the Eagle was towed into the fuel barn as scheduled. What the fuel shop specialists were unaware of was that while the servicing crew made the entries in the right forms, they had actually defueled the *wrong* aircraft.

As a result of this error, a massive fuel leak occurred when the valve was removed. The fuel leak was finally contained after several tense hours. When it was all over, more than 8,000 pounds of JP-4 fuel had spilled, saturating the fuel barn's fuel water separator and contaminating the base's drainage system.

A common thread in both of these incidents was the confusion caused by the fact that both aircraft had the same last three digits in their tail numbers. However, the underlying cause of these occurrences was hasty documentation and poor control of the aircraft forms. In both cases, the specialists involved were under pressure to get their job done so the squadron could fly the mission. Unfortunately, in both cases, the results were just the opposite.

Follow the Recipe

If you've ever had the unfortunate experience of eating someone's cooking when instructions were not followed, then you know why each step in the recipe is important. And so it is with checklists. If you leave out a step or deviate at all from a checklist, the whole job might very well end up looking like a fallen souffle.

One load crew found this out the hard way. They had been given the job of performing a system jettison check following an engine change and centerline pylon installation on an F-15. Technician 1 was seated in the cockpit operating the switches, while technician 2 operated the test equipment on the ground. The "jett check" was accomplished, and the centerline system checked good.

Prior to shutting down the aircraft power, the ground technician started to install the impulse carts in the pylon breeches but had not safety pinned the pylon. After hand-tightening both cartliners, he began to tighten one cartliner with a ratchet when the cartridges fired, slamming the pylon to the ground. Unknown to the man on the ground — who failed to install the pylon safety pin after the jett check — his buddy in the cockpit accidentally pushed the selective jettison button.

This crew was decertified, but it would only be fair to mention the other circumstances involved. For one thing, they were working in cold, rainy weather, and it was their last work order of the day. This led to the "press-on, must-get-it-done" attitude which seems to be at the root of many explosive-related incidents. Sometimes this attitude is intensified when people are deployed, away from their usual supervision and

ANSWER (from page 13)

WHAT'S WRONG IN THIS PHOTOGRAPH?

In addition to rubber gloves and boots, TO 1-1-1, Cleaning of Aerospace Equipment, requires people washing aircraft to wear protective clothing and properly fitted goggles. This duo can expect to suffer skin irritation and possible eye injuries. (See "Survival on the Rack" in this issue.) The truck should be parked with the driver's side nearest the aircraft.

normal routine. Since a great deal of aircraft maintenance, especially our "jettison system checks," are performed at night in cool weather, extreme caution becomes a vital ingredient. So use your recipe (tech data): You'll get the job done right!

Sparrow Alert

An F-15, on a live fire mission, experienced a hung AIM-7 missile. After a chase aircraft determined there was no apparent damage, the pilot declared an emergency and, using hung ordnance procedures, made an uneventful landing. The Eagle was met by EOD people who declared the AIM-7 safe.

The missile was then downloaded and placed on an MHU-141 trailer, with the wings and fins removed. At this time, 52 minutes after the hang fire, the missile hydraulic power unit (MPU) fired vented pressurized fluid through one of the wing hubs. At least one other incident of this type has been reported. According to WR-ALC MPU, activation can be expected after an AIM-7F/M misfire within as little as 15 minutes or as long as an hour. ■

876-SAFE

The Directorate of Aerospace Safety has established a "Safety Hot Line." If you have a safety concern you think the Director of Aerospace Safety should know about, call this AUTOVON number (876-7233) and leave a message. The Director of Aerospace Safety or a member of his staff will personally review and answer each call.

■ Your May article on lightning was very informative. I have two questions:

1. You state that lightning goes from the ground to the sky. Later, you give an example of lightning having shocked an airman when it struck the ground 25 feet from where he was standing. Was it, in fact, exiting the ground?

2. When taking cover in a vehicle, you mention to close the windows. Why? In your example, you imply that the two policemen's pickup FM antenna would not have been struck if they had the windows closed. I don't believe I understand.

Paul Jensen
Lynn, Massachusetts

Lightning does, indeed, go from the ground skyward. This is an unusual fact that is accepted by authorities, including Air Weather Service at Scott AFB, Illinois, and Global Weather Service at Offutt AFB, Nebraska. Yes, the lightning was exiting the ground.

The security police vehicle would have been struck, windows opened or closed. However, the unfortunate people inside may have avoided injury had they not had their arms extended outside the protection of the vehicle. — Ed.

Your article on lightning was indeed timely and informative. I think we should have such emphasis each spring. A couple of years ago we had three men hurt while working on a C-130 when lightning struck more than 1,000 yards from them. Now we have strict rules about taking shelter from thunderstorms.

In the fourth paragraph, you mention that lightning vaporizes the air, resulting in a vacuum, and it's the collapse of the vacuum that causes thunder. Air can't vaporize. My sources say that the air expands so violently that it generates shock waves that we hear as thunder.

Lt Colonel Lewis Long
Peterson AFB, Colorado

Your sources are correct. Air is a vapor, and therefore, cannot be vaporized. The sound we hear is from the rapidly expanding air that was just heated.

Your letters and comments are appreciated. They provide our staff with valuable feedback. ■

Back Row (l-r) A1C Fred R. Bundy (Loadmaster), 1st Lt Robert J. Siani (Nav.), Sgt Vincent W. Schuster (Crew Chief)

Front Row (l-r) Capt David R. Hein (Co-Pilot), Capt Jeffrey S. Spencer (Pilot), A1C Howard W. Jackson (Crew Chief)
Missing: SSgt Roy D. Dowdy (Engineer)

CAPTAIN CAPTAIN 1ST LIEUTENANT

Jeffrey S. Spencer David R. Hein Robert J. Siani

STAFF SERGEANT SERGEANT AIRMAN FIRST CLASS AIRMAN FIRST CLASS

Roy D. Dowdy Vincent W. Schuster Fred R. Bundy Howard W. Jackson

463d Tactical Airlift Wing
Dyess AFB, Texas

■ On 27 March 1988, Captain Spencer was flying as the aircraft commander on a C-130H that was 1½ hours over the Atlantic cruising from RAF Mildenhall, United Kingdom, en route to Rota Air Base, Spain. They were at flight level 180 when he experienced a near catastrophic flight control malfunction.

The aircraft did not respond to autopilot inputs, and Capt Spencer found the ailerons were locked tight after disengaging the autopilot. He maneuvered the aircraft using rudder and differential power while he directed the crew in emergency procedures. The flight engineer and crew chief discovered the aileron hydraulic boost pack was dripping fluid. Apparently, the boost pack actuator was locking the aileron controls. The copilot and navigator coordinated with London Military Radar for an emergency return to Mildenhall.

Capt Spencer found the aircraft condition would not improve, and he established a block altitude for a controllability check. He determined the C-130 responded best with 40 percent flaps using no-flap airspeeds. He also discovered the aircraft had more control in a left turn.

The weather at Mildenhall was "standard" — less than a 1,000-foot ceiling with winds up to 25 knots, 30 degrees off runway heading. Capt Spencer carefully calculated the options for a letdown with an instrument approach in the weather and a crosswind landing with binding ailerons.

Capt Spencer flew a textbook instrument landing system approach and landed safely using rudder, elevator, and differential power for primary flight control. The superb efforts of Capt Spencer and crew saved a valuable aircraft and all passengers aboard the aircraft. WELL DONE! ■

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NITED STATES AIR FORCE

Well Done Award

Presented for

outstanding airmanship

and professional

performance during

a hazardous situation

and for a

significant contribution

to the

United States Air Force

Mishap Prevention

Program.

MAJOR

John Smith

9th Strategic Reconnaissance Wing
Beale AFB, California

■ On 21 January 1988, while preparing to descend from above 60,000 feet after a lengthy U-2R operational reconnaissance mission, Major Smith's aircraft abruptly pitched up to an exaggerated nose high attitude. Pushing hard on the yoke, he prevented the U-2 from stalling, but quickly realized his engine had flamed out. Struggling with both hands to counter the pitchup condition, his efforts were complicated by a rapid inflation of his pressure suit, partially blocking his view of the instrument panel and significantly reducing his mobility in the cockpit. After extensive physical effort, he regained full aircraft pitch control and was able to regulate his inflated pressure suit to obtain an adequate view of his instrument panel.

He restarted his engine prior to entering a solid undercast, but could not regain any navigation aids except TACAN. The recovery base's navigation aids and radar were out of service, so he used another nearby TACAN to orient himself during the descent. Weather at both bases was rapidly deteriorating, and it was uncertain if the engine would flame out again if the throttle was moved from the low power setting achieved after restart.

Fortunately, the local radar returned to service and provided vectors for recovery as Major Smith continued his descent to high key. Breaking out of the clouds at 2,800 feet AGL, he found the visibility to be 1 mile and rapidly decreasing.

He left the engine at low power and skillfully maneuvered to high key. Because of poor visibility, he used his drag devices to circle within sight of the runway and executed a flawless flameout pattern and landing. Reported visibility at landing was a scant half mile.

Major Smith's timely actions and superior airmanship throughout this compound emergency prevented the loss of an extremely valuable national reconnaissance asset. WELL DONE! ■

Congratulations to the men and women of the U.S. Air Force.