

fly^{ing}

SAFETY

MAY 1989

The Man In Gray

Flight Leader

. . . Taking Command

Extended Night Operations

Air Leadership



MEMO

From the desk of
BRIG GEN JAMES M. JOHNSTON III
Director of Aerospace Safety



Leadership is fundamental to military operations, and it is especially time sensitive in the air. Without leadership, there is no discipline, no direction, no success. The position of leadership demands you strive for perfection, exercise discipline in your operations, and set an example for others to follow.

This issue of *Flying Safety* magazine focuses on this important element of mission success -- Air Leadership. We introduce our theme with a message from the Air Force Chief of Staff.

Jim Johnston



General Larry D. Welch, USAF Chief of Staff

AIR LEADERSHIP

The Air Force places great trust and confidence in our field commanders to ensure readiness and thoroughly professional operations. A significant part of the responsibility of flying commanders is the process for selecting flight leaders. Air Force flight leaders are selected based on their experience, airmanship, demonstrated maturity, and sound judgment. With selection as a flight lead comes added responsibility for the safe and sound planning and conduct of each mission flown. Although the Air Force would not hold a flight lead responsible for an irrational act of a wingman or flight member, we do hold the flight lead responsible for ensuring the proper tone and execution of the mission.

Larry D. Welch

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DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, OSAF

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THERE I WAS

■ . . . just cruising along at 35,000 feet, minding my own business. I was in a single-seat fighter, on a clear night around 2100 (that's 9 p.m. for you civilian types). The autopilot was on, so I was mainly concentrating on staying awake and trying to get the air-conditioner to work properly (sounds like an airline pilot's story, not a fighter jock's). Of course, the right-side console lights weren't working, so I couldn't see anything over on that side of the cockpit where the air-conditioning control panel was located. Oh, yes, there is just one more fact to throw into the equation — my mask was hanging at my side.

I had always wondered why this particular type of aircraft didn't have a guard over the cabin pressure switch. During one of my adjustments of the air-conditioner, I must have brushed the switch and dumped pressure. I realized what had happened right away. However, when I reached over to switch it back on, I couldn't see the switch because of the inoperable lights. I reached down to grab the map light

which was laying between my legs, but it was then that I noticed I couldn't see anything outside, and the instrument panel was getting extremely blurred. I looked at the cabin pressure gauge, saw it winding up, and suddenly realized that my priorities were about to change. I needed some oxygen, right now!

I put my mask up to my face and took a couple of deep breaths. But nothing seemed to change too much. The instrument panel was now just a fuzzy blur of lights. The next fraction of a second was used reminiscing about the many hundreds of hours I've spent hauling — at treetop level, pulling Gs while getting wrapped up in knife fights, and breaking "ragged" ceilings to plant myself on icy runways. It occurred to me that I would be extremely embarrassed if I ever bought the farm in some stupid manner like this. It was time to go 100-percent oxygen. But the oxygen panel was also over there in the blackout area. I couldn't find the lever!

Now I finally got mad. I'd had

enough of this 20/2000 vision crap. I started from the back of the panel, spread out my hand, and moved every switch on the entire console forward. I felt the surge of pressurized oxygen immediately. I took two or three deep breaths, and I was again a fully operational member of the human race.

You can probably come up with a bunch of lessons, but here are my two big ones. First, it's the little things that will kill you, usually when your back is turned. I would say cruising along with the autopilot on at 35,000 feet is the lowest risk mission possible in a fighter. But because of the low risk, there is a natural tendency to be a little too relaxed.

Second, there is always a chain of events leading up to bad situations where if only one link is broken, the end result will not occur. For example, if my mask were up, or if the air-conditioner were working properly, or if the lights were operable, none of this would have ever happened. ■

THE MAN IN GRAY



LT COL JAMES P. BRONOWSKI, USAFR
Chief, Safety Division
452 AREFW
March AFB, California

■ Charlie and his copilot Max were slumped in the two aisle seats in the last row of the briefing room. It was their special spot and required a 10-minute early arrival to secure these choice seats.

For today was the monthly flying safety meeting, and Charlie had earned the prestigious rear seat because of his seniority among the aircraft commanders and his selection for instructor status. It is the best seat in the house to fling barbs at other pilots during the meeting. And like the gunslingers of old, having your back to the wall is the best way to keep your eye on everyone in the place and is the easiest



As a senior AC and newly selected IP, Charlie had earned the "prestigious rear seat."

spot to defend, because you don't have to turn around.

Max had inherited the spot of honor through association. To be on Charlie's crew was akin to making it to the major leagues. There was no doubt in Max's mind that Charlie was the best pilot in the world. Max idolized Charlie, and they were sol-

id friends. Max mimicked everything Charlie did, and when they were separated, which was seldom, people would ask where his brother was.

Charlie's feet were propped up over the theater seat in front of him, forcing his knees to about eye level. It was an uncomfortable position, to say the least, but apropos to one who wears the crown. His hands rest, clasped together in his lap — very confident and very much at ease waiting for the safety meeting to begin. From time to time, it becomes necessary for him to pivot head and elbows to observe someone entering from the two rear doors.

Max is positioned as a mirror image of his boss. As crewmembers start slowly wandering in, doing the "flight suit stroll," he accepts the

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THE MAN IN GRAY

continued



comments his mentor makes about each one with the total assurance that every critique is true and correct. He also knows this idyllic relationship between Charlie and himself isn't to last much longer because of Charlie's upgrade to instructor. But in the meantime, it is proper and right to take advantage of one's established position in the hierarchy of the pilot's social ladder.

"Hey, Steve," Charlie called towards a tall, dark-haired lieutenant who had just entered the room. "Saw your landing yesterday. Hope nobody was hurt. Great carrier landing, though. Rudder pedals are

those funny-looking things on the floor, ya know."

The lieutenant looked at Charlie with noticeable hurt in his eyes, took the four cuts at his flying ability, glanced around at the others looking at him, and silently took his seat.

Charlie turned towards Max and said quietly, "My, isn't he the touchy one?"

Max wasn't sure he would care for the public ridicule that Steve had just endured either, but he wasn't about to mention anything to his boss.

Just then Charlie's feet hit the

floor as he abruptly sat up straight. It took Max a matter of seconds to determine the reason for this unorthodox behavior from Mr Cool himself. For there, standing with her hands on her flight suit pockets, was the prettiest pilot in the Air Force. At least Max thought so, and from his reaction, so did Charlie.

"How are you doing, Charlie? It's so nice to see you again," she said softly, and then laid a smile on him that left no doubt in any observer's mind that this blue-eyed dream was interested in Max's buddy.

While the smile still shone, Max could see the flush come to Charlie's face. His cheeks turned sunburn red as he searched his memory bank for clever comebacks and witty sayings.

"Uh . . . just fine, Christy," was the best he could do. And to top it all off, as he brought his arm up to give her a casual wave, he knocked his paper cup of hot coffee off the armrest, and its contents hit dead center on his lap.

As Charlie tried to act casual about the hot liquid now burning into his flesh, Christy turned, walked a couple of rows down, and moved in to sit next to her aircraft commander, Steve. After sitting down, she shot another glance at Charlie, but he was very busy trying to recover from possible third-degree burns.

Max watched Charlie slap at the giant wet spot on the front of his flight suit in a feeble attempt to make cool what was very hot and wet. Max knew now he would soon be losing his friend to the devastator of all cool guys: Love. He watched Charlie's mouth drop open in an uncontrolled response when she smiled and noted he was at a loss for words when she spoke. Watching his buddy — the Pilot's Pilot, the Man, Mr Cool, the Iceman — turn into a quivering mass of gelatin made Max a bit ill. After seeing the damage done after one smile, there wasn't any doubt in Max's mind who would be riding left seat in that relationship.

The time was now 5 minutes past the scheduled start of the meeting, and people were still wandering in,



As crewmembers wander in, Charlie critiques their landings and other piloting techniques. He would learn today how important these critiques are as he assumes his new role of IP.

Instructors must "tell it like it is" — no matter who the crewmember may be!



Max could see this pretty pilot had unnerved his favorite aircraft commander.



picking seats near people they liked, or at least could associate with.

The flying safety officer was at the podium rearranging a stack of papers, two individuals were setting up the video tape machine, and everyone was talking. Suddenly, the flying safety officer dropped his hands to his sides, stood erect, and in a relapse to his Academy days, barked out: "Squaaad . . . rooon, ten hut!"

There was an immediate clatter as seats snapped back, a few unsecured objects fell, knees cracked into seat backs, and a couple of sets of boot heels clicked together. Then silence, save for the footsteps of a single individual coming down the aisle at a rapid pace. Silver eagles rested on the shoulders of the imposing figure that made its way towards the podium. It was the Wing Commander.

When he reached the podium, he

walked behind it and stood looking at the assembled crewmembers. People started to fidget, waiting for the command to sit but it did not come. Instead, the colonel moved his eyes over every face in the room at a deliberately slow pace as if he were trying to identify someone in a police lineup.

"What's going on?" Max whispered through his teeth.

"I don't know," was Charlie's quiet response.

The Wing Commander had moved to a spot right in front of the center row of seats, all of which were empty. He took a final scan of the 60 or so men and women at attention, and then gave the command, "Please be seated."

There was the rustle of flight jackets and the thumping of springloaded theater seats as all eagerly obeyed the command. In the few seconds it took to get everyone settled in, the colonel took another

look through the group. Then curiosity brought silence again as all waited for the Commander to speak.

"Late last night I received a phone call," he began. "My closest friend of 25 years was killed in an aircraft accident yesterday. The call was from his wife. I was best man at their wedding and attended both their daughters . . ." His voice trailed off.

He stopped for a few seconds, looked towards the ceiling, and then drew in a deep breath.

"You people are my responsibility," he continued. "I am accountable for your safety. I will not allow any variations to established procedures, nor will I tolerate any disregard for safety practices. I am your safety officer!"

As he paused, there was dead quiet in the briefing room. Even the whir of the electric clock above Charlie's head could be heard throughout the room. There was no doubt in anybody's mind that this highly respected man meant serious business.

"I have given a great deal of thought, most of the night, in fact, to what I can do to ensure none of you are injured or killed in the line of duty," he said with some of the firmness leaving his voice. "I have asked a friend to speak to you this morning at my safety meeting."

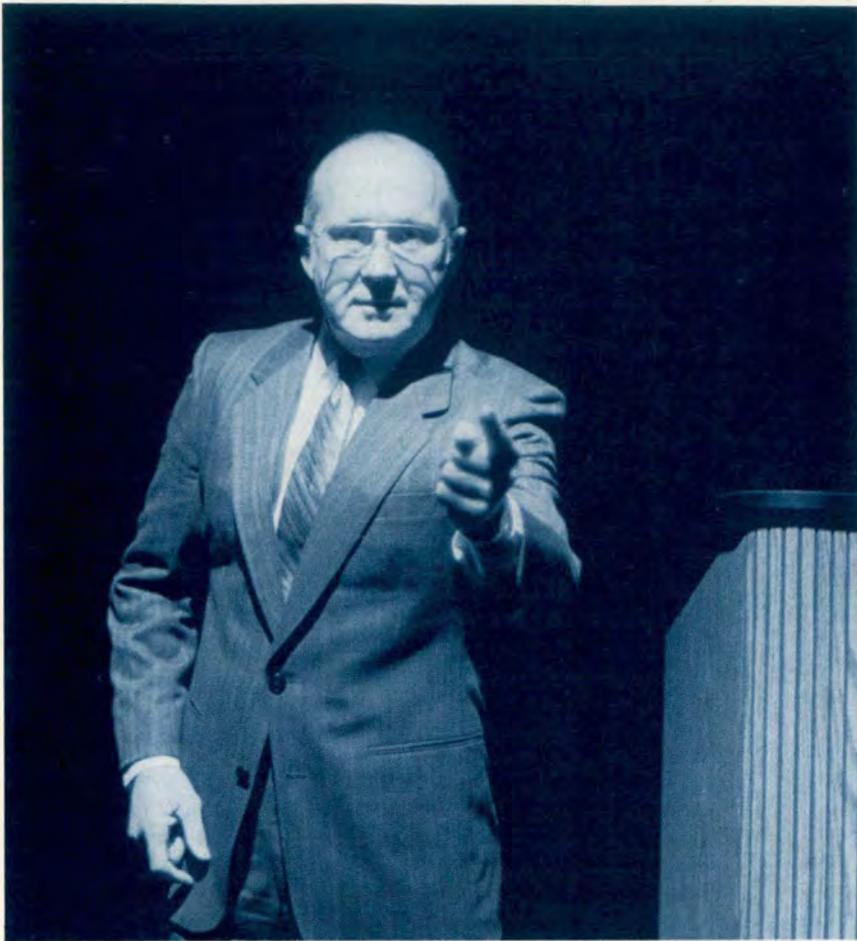
The Commander took two steps forward, turned, and sat in the middle seat of the front row. All heads, save his, pivoted to the rear of the room. There, standing on the auditorium stage, arms at his hips, was a man dressed in a gray jacket and slacks. He was partially bald, and the top of his head reflected the overhead lights like a polished table. The man stood almost 6 feet tall, and it was obvious he kept himself in good shape, because an accurate guess of his age would be difficult.

"Good morning, ladies and gentlemen," he said, with a strong voice that filled every corner of the room. He remained standing, arms still folded, as his bright, blue eyes scanned the assembly. Everyone remained half turned in their seats, not knowing what to expect.

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THE MAN IN GRAY

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Charlie listened intently to the man in gray define the importance of the IP's role. "You are the key to flying safety . . . The flying instructor is the core of the Air Force."

The man dropped his arms to his sides, and then with giant strides, walked down the slight incline to the front of the briefing room. As he swung around towards the group, a giant smile highlighted his face. It was a natural smile, and no doubt he wore it all the time.

"I will be very brief today," he began. "But what I have to say is most important.

"My name does not matter, nor would you remember it if I gave it," he continued. "Let it suffice that I flew combat in three wars and accumulated another 12,000 hours in peacetime. What I have gained through all that experience is a caution and respect for any aircraft I fly and a profound appreciation for safety in all flying operations."

He lifted his right arm and made a sweeping movement across the group. "You are the strength and fighting resource of this country. You are the limited resource we cannot afford to lose or waste. You are the reason the flying safety program has to be the commander's highest priority.

"Everyone is responsible for flying safety, and you all know that. But there is a group of you that are most directly involved and will ultimately be a factor in who lives and who dies."

As he paused, there was a noticeable nervousness among the crewmembers. They were looking around, wondering who he was about to single out that could have such an influence in matters of life and death.

The smile left his face and was replaced with a look of seriousness that immediately drew everyone's undivided attention.

"It is you instructors that I'm referring to," he said, as he pointed his right index finger at a major who was sitting three rows from the front. "You are the key to flying safety. You determine the habit patterns and techniques of all the fliers. The example you set and the minimum standards you maintain for yourself are what establish the quality of the unit. In the end, the flying organization and its safety record will be no better than the



Charlie found that "telling it like it is" has its consequences. In spite of this, a good instructor must identify and correct weaknesses, both in people and in procedures. Charlie learned that being a good instructor requires diplomacy and tact.

quality and professionalism of its instructors."

He now stood with his feet apart and his hands resting on his hips. "You instructors were hand selected because you are the best. You have demonstrated above-average flying abilities and a capability to effectively work with others."

Max gave Charlie a quick sideways glance. He was indeed proud of his aircraft commander, but there would be no possible way to let him know that. He could see Charlie was intently hanging on every word the man was saying.

"I propose to you instructors that you don't really realize how important your job is," he went on. "Not only must you teach correct procedures and accepted techniques and monitor the flying proficiency of all crewmembers, you have an even more important and critical mission. You must find and identify weaknesses, both in people and procedures, and then correct them. If a critical weakness in a flier cannot be corrected, that individual should not be in a flying position, and it is your responsibility to ensure they are not!"

"The flying instructor is the core of the Air Force. The effectiveness of our air arm is totally dependent on the instruction our aircrews receive. The lives of our fellow fliers depend on your skill and dedication. There can be no more important or more honored profession than that."

The man in gray looked down at the Wing Commander and said something quietly to him. The Commander then stood and shook the man's hand vigorously, then put his right arm around the man's shoulder, and the two of them started towards the back of the briefing room, talking quietly.

The room was strangely quiet as the words were still sinking in to the group. Suddenly, someone realized the situation and called the room to attention. It didn't matter, as the pair had already departed through the rear door. Everyone was standing now from the call to attention, but realizing the Commander had departed, they all started talking and discussing the past few minutes.

Max turned to Charlie and said, "Man, that was awesome!"

"It sure gives me a whole new concept of the instructor program," Charlie added.

Charlie then noticed that Christy had moved into the aisle in front of them and was staring at him. Her lips were drawn tight, and her eyes were stone cold, sending a message that was the complete opposite of her last eye contact with Charlie.

Max took a step sideways, as he could see the impending conflict.

"Charlie," she began, as his name slid from between clenched teeth. "Steve tells me you didn't like my landing yesterday. He said you broadcast it all over the room before I walked in. You are certainly lacking any class whatsoever."

The best Charlie could come up with was a very weak "Ahhhh . . .," which she didn't hear anyway because she spun around and stormed out the door.

A smile came to Max's face with the realization that his good friend's bachelorhood would remain intact for at least the foreseeable future.

"You know, Max," Charlie said, as he slowly sunk back into his seat. "Being a good instructor requires good hands AND diplomacy." ■



ZAP

CMSGT ROBERT T. HOLRITZ
Technical Editor

■ Spring is here, and with it comes the warm weather that brings thunderstorms. The number of days that produce thunderstorms varies in the United States from as few as 3 in the Southern California desert to as many as 93 in central Florida. Each year, 200 people are killed by lightning in the United States alone.

A Deadly Phenomenon

Without a doubt, lightning is the least understood and most deadly of all weather phenomena. Although it has been more than 200 years since Ben Franklin performed his famous kite experiments, we still know little about the mechanics of lightning. What is known is that a thundercloud generates negative ions which finger their way earthward in pencil-size streams called step leaders. The strong, negative

attraction of the cloud creates a positively charged ion shadow along the ground below it. It was this positive charge that made Franklin's fingers tingle during his experiment. Many scientists agree that had the kite actually been struck by lightning, he would have been reduced to a pile of ashes.

When the negative charge of the step leader meets the positive ions from the surface, they form an electrical path, and an upstroke of positive ions shoots skyward at the incredible speed of 241 miles per second in the form of a lightning flash. Therefore, in spite of the illusion, lightning actually strikes from the ground to the sky.

A typical lightning stroke generates temperatures of up to 50,000°F, five times that of the surface of the sun. Because of the tremendous heat, the air in the path of a lightning bolt is literally vaporized, resulting in a vacuum. As a result of the surrounding air pressure, the vacuum quickly collapses, creating a thunderclap.

Electrical charges of 100 million volts and currents of 100,000 amperes are not uncommon. The effects of lightning are awesome and often bizarre. It has been known to weld manhole covers shut, destroy bridges, and even bake unharvested potatoes in the field.

Lightning Mishaps

Within the past 10 years, at least 20 Air Force members have been injured or killed by lightning. Most of these incidents occurred on the flight line. Flight line operations are particularly susceptible to lightning strikes, simply because metal aircraft, with their tall, verticle stabilizers, naturally attract lightning. Because modern aircraft with their metal skin normally dissipate lightning, it is safe to say a pilot would be more at risk stepping to his aircraft in an electrical storm than flying through one.

When working on the flight line, it is important to understand that lightning rarely strikes a human

Lightning is the least understood and most deadly of all weather phenomena.

Within the past 10 years, 20 Air Force people were killed or injured by lightning. Most of these incidents occurred on the flight line!

directly. Most deaths and injuries are caused by the intense electric field generated when lightning strikes an elevated object, such as a tree or a parked aircraft. Lightning shocked an airman when it struck the ground more than 25 feet from where he was standing, rendering him unconscious and permanently injuring him. And two airmen were killed when lightning struck a B-52 parked 75 feet from them. The fact is, you can be killed by a lightning strike as far as 700 feet away!

Servicing an aircraft is prohibited when lightning is within 3 miles (TO 00-25-172). However, it is wise to stop all servicing at the first sign of thunderstorm activity. Don't wait until you see lightning. The first stroke is just as deadly as any. And the ion shadow previously mentioned is capable of igniting fumes during refueling operations. It should be mentioned here that launch, recovery, and end-of-runway operations are particularly hazardous when thunderstorm activity is in the area. This is because, un-

der certain conditions, lightning strikes 3 to 20 miles away can induce voltages up to 60,000 volts on an ungrounded aircraft. Such voltages can be lethal.

Taking Cover

There is no absolutely safe shelter from a thunderstorm. However, a large building is the safest place to take cover. If at all possible, don't take shelter in a metal building. One airman received a jolt while leaning on a metal door inside a hangar, and an officer standing next to a metal desk received a shock through a zipper in his flight suit.

The next best place to take cover is in a vehicle. However, be sure to keep the windows closed. Two security policemen, guarding the flight line, had a shocking experience. Sitting in a pickup truck, with the windows down, they were zapped when lightning hit the FM antenna on the truck. It passed through the truck, knocked two holes in the concrete ramp, and exited through the two front tires, splitting the rubber down to the wire cords. Both were treated for electric shock and damage to their eardrums.

Injuries Are Preventable

Fortunately, most personnel injuries from lightning are preventable. In every case where flight line people were injured by lightning, a warning was issued by the base weather station. The people either did not get the word or chose to ignore the warning.

Meteorologists estimate that lightning strikes somewhere in the world about 100 times every second. Consider this: The odds of you being killed by a bolt of lightning while working on an aircraft during a full-blown thunderstorm are greater than Ben Franklin's when he performed his kite experiments.

Don't Take Chances

Ben was lucky. If the trend continues, two Air Force people will be killed or injured by lightning this year. Don't take chances. Treat lightning with respect, and you won't become a statistic. ■

FSO's CORNER Flight Safety Bulletin

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

■ Do you ever get the feeling that no one reads the material you place on the flight safety bulletin board? I know I do. What have you tried lately to change that? I don't mean don't think about it. I mean, what have you tried lately to get "their" attention? Brief, brief, and rebrief works OK, but some aircrew members remain staunchly resistant to "flight safety" information.

Last year I was talking to the FSO at the 437th Military Airlift Wing about this problem. He told me that he made up a flyer using a safety supplement from their Dash 1. To do that, he covered the text with a blank sheet of paper and proceeded to the copier. Once he had the "new" flyer in hand, he drafted his own text and proceeded back to the copier.

The flight safety flyer disguised as a safety supplement got a lot of attention, and the flight safety message got out. He told me he tried to reserve the safety supplement format for really important information, because he was afraid its effectiveness would diminish with excessive use. Let's hear it for a relatively simple idea that works.

Major Dale Kortum, formerly the FSO at the 437 MAW at Charleston AFB, provided this month's FSO's Corner idea.

The FSO's Corner needs your ideas. If you have something in your program that could help other FSOs if they knew about it, call me (Dale Pierce) at AUTOVON 579-7450; or send your name, AUTOVON number, and a brief description of your program idea to either 919 SOG/SEF, Duke Field, Florida 32542-6005, or Defense Data Network (DDN) mailbox: AFRES.919SOG-SE@GUNTER-ADAM.ARPA. ■

Closing Remarks

MAJOR MARK E.S. MAYHEW
Directorate of Aerospace Safety

■ The Base Realignment and Closure Commission has recommended a number of military facilities be closed or modified. While this recommendation requires congressional and presidential approval, with the current environment of budget cutting, that approval should occur. Therefore, starting in 1990, we will see some of these installations begin to close.

It is not so much the actual closure that concerns me, from a safety standpoint, as the psychological and physical changes that can present hazards. As we develop in our jobs, we recognize certain situations have the potential to cause a mishap. For example, if I know I may have a late takeoff, I might alert the crew that we are going to be trying to get off on time, but we must all be especially vigilant so that our exuberance doesn't cause us to miss checklist items or take unnecessary risks. So it is with the announcement of a base closure. It raises the same warning flag.

In some cases, the physical hazards may be very obvious, and in others, more surprising. First of all, there will be a great deal of activity on and around these bases in preparation for the movement of their units. Many of the preparations include palletizing and stacking of cargo and the relocation of equipment. Unfortunately, these relocations may be going on when you are trying to taxi down an otherwise clear taxiway, thereby causing delays, alternate taxi routing, and frustration — all of which can contribute to a mishap. If this occurs at night, the cover of darkness can

make matters even worse.

If you are transiting one of the targeted bases, be especially cautious. Not only are the closing bases experiencing configuration changes, but also the bases to which units are moving. For a time, the ramp may be crowded, and extra care and time may be needed until the gaining base recovers from its growing pains.

The physical hazards may be easy to spot, but the psychological ones might not be. Many factors are the same as any PCS — breaks in concentration due to thinking about the move. Will the new base have adequate housing? Will I be able to sell my house? Are the schools any good? Will my spouse be able to find a job?

Also be aware of another mentality. For lack of a better choice of words, I'll call it the "Don't worry about it" or "Don't fix it because they're going to close the base anyway" mentality. A variation of this theme is "Don't bother reporting that hazard — they'll never spend the money to fix it."

However, the fact that a base is closing doesn't make any hazard you notice less threatening. Actually, it may be more so because of the funds reduction. Don't accept anything less than the high standard of performance you would have expected were the base not closing. If you see a hazard on the aerodrome, report it as you normally would, and tell other squadron members about the problem through your safety office. While costs may prohibit a permanent fix, temporary methods can be found to reduce or eliminate the hazard until the base closure is complete and operations have ceased. ■

INTRODUCING
OUR NEW
REGULAR
FEATURE

FLIGHT LEADER

REFLECTIONS OF AN ACE

LT COLONEL KENT KOSHKO
Editor

■ So you want to be an ACE . . . first, you must learn to think and fly like one. If you want to wear the medal of an ACE, you must have to act like one . . . learn to **lead!**

Start by being an exemplar. Demand excellence in yourself and accept nothing less. Take pride in your daily flying, to include all ground preparation as well. Be tough in every part of your flying . . . accept nothing that isn't done right.

Challenge conventional wisdom to find better ways to improve procedures, tactics, and ROE. Be tough in your critiques. Learn to motivate. **Never be a good loser.**

If you want a good comparison for motivation . . . think of how sharp the USAF Thunderbirds appear. They look sharp, they act sharp, and they fly incredibly well together. Each pilot knows his responsibilities — stays within them, and admirers love every maneuver. Pilots who like to take shortcuts and be show stoppers should take a lesson.

Above all, be honest with yourself. Always maintain your integrity by never taking shortcuts. Demonstrate courage by making tough decisions and taking full responsibility for them. How well your fellow aviators trust you may very well determine how well they follow you when the "heat is on."

"To be successful . . . you must know how man reacts. Weapons change but man who uses them changes not at all. To win battles you do not beat weapons — you beat the soul of the enemy man." Gen George S. Patton, 6 June 1944.



A flight leader not only masters his own weapon systems and tactics, he studies his adversary. Study his history, learn how he thinks and what motivates him. Memorize the capabilities and limitations in his weapons.

Leadership in the air means everyone knowing their specific responsibilities and executing them with precision. Being a strong team player is critical to mission success! There is no room for compromise. Our history is rich with examples of how great teamwork ensured success for American aviators.

- Midway
- Inchon
- Berlin
- Linebacker

In combat, teamwork is vital; without it, the battle is likely to fail.

Flying safely isn't corny, it is **mandatory** and is the best way to ensure you will fly again tomorrow. In combat, when you are outnumbered and outgunned, the procedures you learned which have become instinctive will help you defeat the enemy. Learn the procedures, use your skills, fly aggressively as required, and do it smart, do it safe. Some of your predecessors didn't heed this advice and paid heavily for it.

So take pride in your unit and in **YOURSELF**, and remember my motto . . . " **BE BOLD ENOUGH TO BE THE BEST!**" ■

Our July "Flight Leader" will feature *Maintain the Edge* . . . Watch for it!

Send me *YOUR* flight lead stories, so we can share them with others. Call me at AUTOVON 876-2633/2634 or write me at Editor, *Flying Safety Magazine*, HQ AFISC/SEPP, Norton AFB, CA 92409-7001.

Air Leadership . . .

COLONEL DAVID E. PINE
Directorate of Aerospace Safety

■ Flying at 500 feet and 500 knots requires good hands, quick thinking, and expert planning. Add another aircraft to make a formation flight and there's one more thing you need — **leadership**.

In the air, there can only be one person calling the shots. Discussion has its place during the planning and post-flight phases of a mission, but while the engines are running, there isn't time for majority votes. In short, everyone must know who is in charge.

A review of some past flight mishaps highlight both good and bad examples of leadership.

Good Leadership

- A bird hit an F-111's wind-

screen while the aircraft was flying at 510K at 500 feet. The strike made a 15-inch hole and scattered bird remains, plexiglass, and metal fragments throughout the cockpit.

As the pilot fought disorientation from windblast, the flight lead joined on the disabled aircraft and attempted radio contact to provide guidance. However, the windblast through the hole in the windscreen was so deafening, it prevented verbal communication. The flight lead used visual cues to lead the disabled aircraft toward the nearest suitable airfield, 100 miles away.

During this time, the flight lead coordinated with all controlling agencies en route to the recovery base, freeing the mishap crew to concentrate on aircraft control and appropriate checklist actions.

■ An A-10 flight examiner (FE) was conducting an instrument proficiency check ride on the lead A-10

pilot. After 30 minutes, the FE noticed the other pilot begin to demonstrate poor judgment and a lack of situational awareness. Also, the pilot was not responding to all radio calls and appeared to be having trouble with basic aircraft control. Suspecting hypoxia, the FE called Mayday, declared an emergency, and directed the other pilot to use 100 percent oxygen from his emergency oxygen bottle.

After several minutes, the pilot began to recover and respond to radio calls. The FE selected an alternate airfield, checked weather, reviewed the approach procedures, and talked the affected pilot through his before-landing checklist.

The approach and landing were uneventful. The FE's quick analysis of the situation and immediate corrective actions kept the A-10 pilot from becoming completely incapacitated and prevented the loss of life and aircraft.

Poor Leadership

■ The flight lead of an A-10 5-ship mission cancelled IFR clearance to proceed VFR at low altitude to the destination airfield. Shortly thereafter, the flight was unable to maintain VMC but, nevertheless, entered the weather in violation of AFR 60-16. The flight lead also failed to ensure the flight was in an appropriate formation before entering IMC, resulting in a flight member initiating lost wingman procedures. The flight member attempted a rejoin in IMC without requesting clearance and before completing lost wingman procedures.

During this time, the flight lead channelized his attention on getting to VMC and lost situational awareness. He leveled the flight at 1,200 feet below MOCA, failed to issue guidance to the lost wingman, and allowed the mishap pilot to descend and level 1,700 feet below MOCA.



Our airplanes help us accomplish the mission . . . despite all their technology, they are only tools. In the end, airmanship and air leadership will determine our mission success.

TAKING COMMAND



In the air, there can only be one person calling the shots . . . know who is in charge!

The lost wingman impacted a mountain while in IMC and was killed.

■ A flight of two F-4Ds received an air refueling just minutes prior to their low-level entry, placing them in a heavyweight aft CG condition. During the descent to low level, the flight lead observed his wingman in a position wider than briefed but failed to correct him. During maneuvering for low-level entry, the flight lead failed to monitor the wingman's position and made a 60-degree bank turn into the wingman. The wingman channeled his attention on the flight leader and attempted to fly a position about 1,000 feet out, 30 to 40 de-

grees aft, and down the wingline, by using reduced power and speed brakes.

This created a high descent rate and low airspeed. The pilot stalled the aircraft trying to arrest his descent close to the ground. The crew attempted ejection prior to impact but were outside the ejection envelope and were killed.

Final Determinant

Our airplanes are designed and maintained to help us accomplish the mission. Yet, despite all their sophisticated systems and technology, they are only tools. In the end, airmanship and air leadership will determine mission success. ■

Thanks For Your Great Support!



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

Sgt Jeffrey D. Cumberland
171 AREFW
Greater Pittsburgh IAP,
Pennsylvania

The captions all of you are sending us are super . . . continue in your clever ways! Apparently you really love our contest. We all enjoy reading your captions. Keep them coming. As always, it was very difficult to

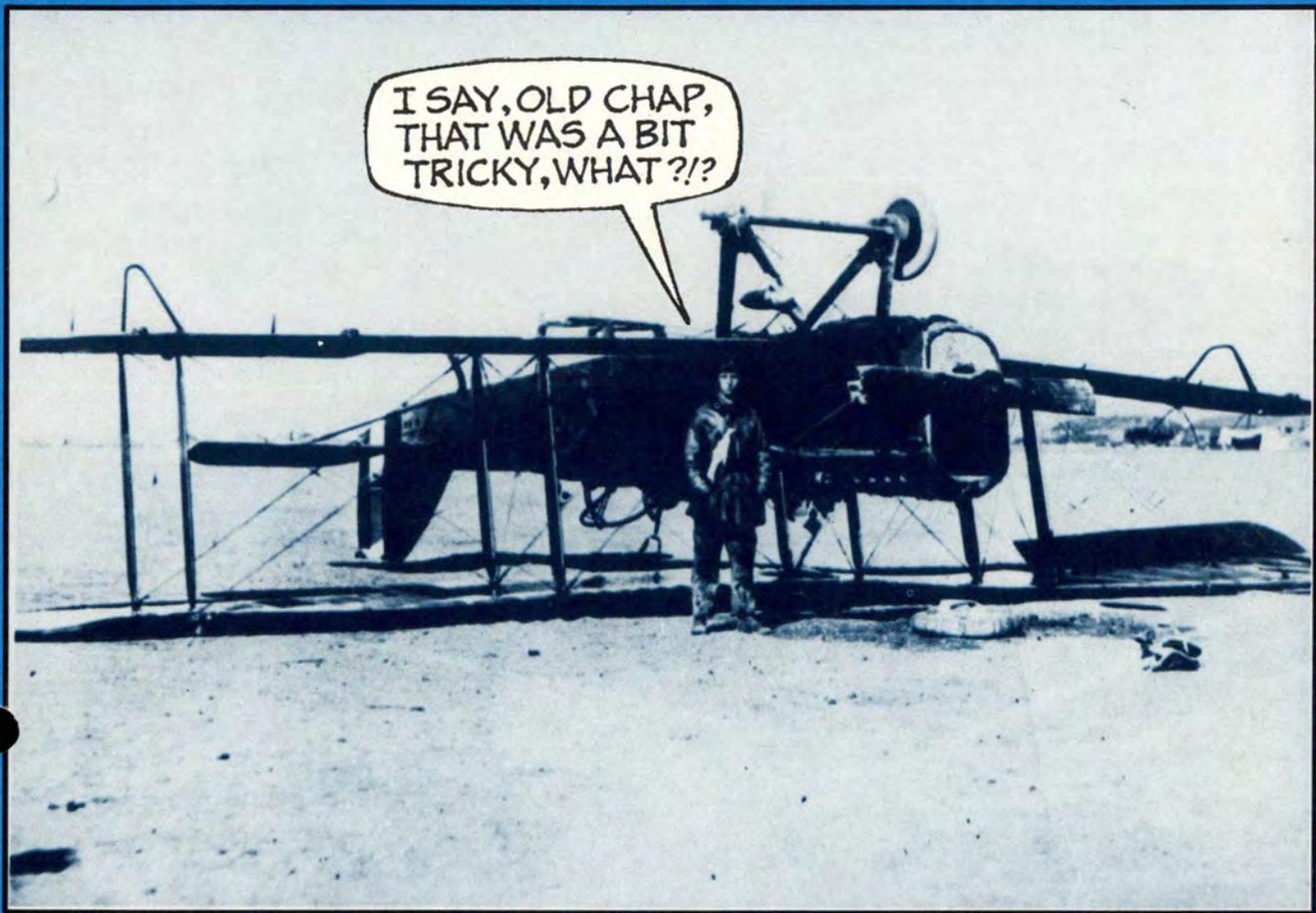
select a winner, but we finally did. Congratulations Sgt Cumberland. Your cheap little prize is in the mail.

The next 10 most popular captions are listed below as honorable mentions. Keep up the good work!

HONORABLE MENTIONS

1. L. "How long do you think it will take the boss to notice this?"
 R. "I dunno. Hurry up with that tube."
 MSgt Gerald L. Meurs, 27 AGS/CCQT, Cannon AFB, New Mexico
2. L. "Supply said that tire was ordered for it, so put it on!"
 R. "I know, I know, but it just doesn't look right to me."
 Sgt Susan Winings, Utes Dr. #1 — APAFR, Avon Park, Florida
3. L. "Boy, I'll be glad when the money shortage is over."
 R. "Yeah, I'm tired of scrounging for parts."
 Sgt Chris Letterman, 443 MAW, Altus AFB, Oklahoma
4. R. "And then, I'm going to get a foxtail, some mudflaps, handlebar streamers. . ."
 Capt Henry H. Dorton, Jr., 135 TAG-MD ANG, Baltimore, Maryland
5. L. "They put the Chief on the fatboy program."
 R. "Yeh . . . bet he don't blow this one out!"
 John Abbott, 12 ABG/DARC, Randolph AFB, Texas
6. L. "You ordered that from Supply?"
 R. "Yeah, the guy said it was a suitable sub."
 MSgt Norman B. Rhodes, 355 TFW/SEW, Mountain Home AFB, Idaho
7. L. "Boy! Things sure have changed since the Gramm-Rudman Act was passed."
 R. "Yeah! These eight-ply tires last forever."
 SSgt Thomas E. Lyons, 171 AREFW-ANG, Greater Pittsburgh International Airport, Coraopolis, Pennsylvania
8. R. "Doesn't matter, Sarge, I'm going for *TRACTION* with *this* baby."
 Capt Henry H. Dorton, Jr., 135 TAG-MD ANG, Baltimore, Maryland
9. R. "I know, Al, but *this* one won't need spokes."
 Capt Henry H. Dorton, Jr., 135 TAG-MD ANG, Baltimore, Maryland
10. L. "The colonel wants this bike ready for his cross-country trek."
 R. "Okay! Let's install these new all-terrain tires."
 Art Butler, 60 MAW/MASB, Travis AFB, California

Write A Dumb Caption Contest Thing



PHILEAS FOGG, AFTER AN EMERGENCY LANDING BY PASSEPARTOUT.

Knock, Knock! "Who's there?" "Opportunity." Can you beat our dumb captions? If you send us the best one, we'll send you our cheap little prize and also feature your caption in an upcoming issue. Can you afford to pass up such an opportunity?

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. You may also submit your captions on a plain piece of paper. Entries will be judged by a panel of experts on dumb humor 3 July 1989. All decisions are relatively final. ■

Send your entries 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 MIKE WEBB
IFC/IP
Randolph AFB, Texas

■ As the focal point for the Air Force instrument flight procedures, we have received numerous inquiries on instrument-related topics. The Instrument Flight Center is beginning this series to provide a forum for answering USAF aircrews' instrument questions. To disseminate this information to all aircrews, we plan to publish selected questions submitted to us (on the pre-addressed instrument question form provided on the next page), along with our comments and answers. If you like or dislike this approach, please let us know. Here's the first set:

QUESTION: Looking at the ILS RWY 27 for Flint/Bishop International Airport (figure 1), HARRO intersection is listed as an IAF. How is the intersection defined, and would you use the localizer or the VOR for course guidance while holding at HARRO?

ANSWER: HARRO is defined by the 272° localizer course or the FLINT 090 radial and either FNT 10 DME or PSI R-006. The inbound course for the holding pattern is defined as 272°. The localizer course is also 272°. Without any other guidance given, the holding course must be off of the localizer course. The FLINT VORTAC cannot be used for the holding course since no radial compatible with the 272° holding course is provided from the VORTAC. The bearing from FLINT VORTAC to HARRO is 090° with the 090° radial published through HARRO. (Note: All radials on IAPs are depicting the inverse of the 272° localizer course, not a radial.) If FLINT VORTAC was to be used for

holding guidance, the inbound course to the holding pattern would be published as 270°. To further substantiate this point, look at the low altitude en route chart for this area (figure 2). Here HARRO is obviously defined by the 272° localizer or the FLINT 090° radial, but no holding provisions are given. Knowing how the IAF and the holding pattern are defined will give us the required information to determine what to use for inbound holding course guidance. In this case, only the localizer will be used.

QUESTION: Can we consider a side-step a circling approach? Can we, in fact, side-step or circle from an ILS? Why not from a PAR? 347 TFW, Moody AFB, Georgia.

ANSWER: The answers are No, Yes, and it depends. No problem, let's go on to the next question. You want an explanation?! Now we are complicating the issue. A *side-step* is a *side-step*, and a *circling approach* is a *circling approach*. To fly a side-step, side-step minimums must be published on the approach procedure. If no side-step minimums are published, ATC should not (FAA Hand-

book 7110.65, Controller's Handbook says "will not") clear you for a side-step maneuver. If you need to land on the parallel runway, you will be cleared to circle to that runway. The differences between the two are in the protected airspace provided by TERPs. Most pilots are familiar with the circling protected airspace as depicted in AFM 51-37, Instrument Flying. The protected airspace for a side-step is similar to that of a straight-in, but is extended to include the adjacent parallel runway. This is less airspace than the circling area, resulting in fewer obstacles and normally a lower minimum descent altitude (MDA). You may side-step from precision approaches (ILS or PAR) if side-step minimums are published. Side-step minimums for PAR approaches will be listed in the front of the IAP booklet along with the straight-in minimums.

The question of circling from a precision approach has been asked numerous times. AFM 51-37 states that pilots should not plan to circle from a precision approach. We use the word "should" because some agencies will publish circling minima for precision approaches, but this is rare, and if it is the only way

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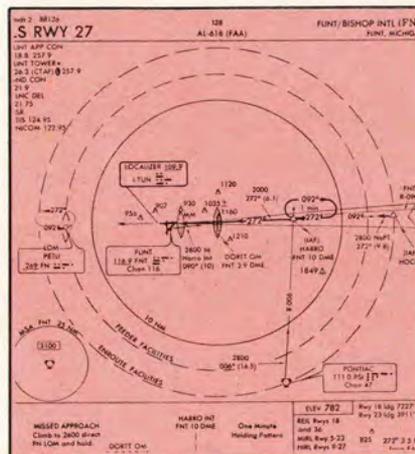


Figure 1.

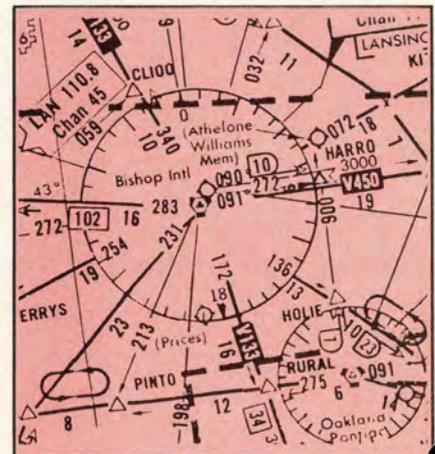


Figure 2.

Fold

USAF IFC/FOT
RANDOLPH AFB, TX 78150-5001

USAF IFC/FOT
RANDOLPH AFB, TX 78150-5001

Fold

IFC Approach

continued

to recover an aircraft, you may have to use it.

Circling procedures are not compatible with precision approach procedures. The problem is in determining where or when to go missed approach. For a nonprecision approach, the missed-approach-point (MAP) is either a published fix or period of time. A precision approach MAP is based on an altitude, for example, decision height (DH). This causes a problem with accomplishing the missed approach part of the circling procedure if the airport environment is not encountered.

For example, if the circling MDA is 900 feet compared to a 200-foot DH, you would have to use the 900 feet as your DH, since there would be no other way to determine a MAP. This goes against the basic circling procedure of descending to the MDA and flying in toward the airport or runway to a MAP or sighting of the airport environment. If flying a precision approach, we would have to go missed approach at 900 feet if we did not have the airport environment in sight. We could be as far as 3.5 NM from the airport or runway when we reach DH, having never been given a chance to see the airport or runway environment. Normally, the MAP for a nonprecision approach will be within 1 nautical mile of the airport or runway.

You say you will just use the localizer MAP. That's right, but now you are flying the localizer approach and using nonprecision procedures which will work. If you want to fly the PAR and have the controller call your MAP, he will have to use ASR procedures and the ASR radar scope unless they have the PAR azimuth scope set up to fly the ASR approach. Again, as in the ILS, you are using nonprecision procedures which are compatible to circling procedures.

I hope this helps answer some of your questions. If you wish to discuss these topics or others, please feel free to give us a call at AUTOVON 487-3077. ■

COOPERATION IS NICE . . .

CMSGT AUGUST W. HARTUNG

■ A flight of two F-15s took off and entered the working area to accomplish a basic flight maneuver (BFM) mission. But weather dictated that the pilots, one an instructor and the other in upgrade status, accomplish a prebriefed, backup gun exercise instead.

After four gun passes with the cockpit master arm "safe" and a no-shoot cue, the pilot in upgrade status placed the master arm to the "arm" position. Then he made a fifth pass and pulled the trigger. To his surprise, the gun fired 57 rounds! Fortunately, no aircraft damage was noted, and both jets recovered to the nearest base.

It's Happened Before

Those of you who fly or maintain Eagle jets may have seen this same scenario before. But since this is another mishap, it's worth repeating the sequence of events that led to this gun firing when it should not have happened.

Everyone Cooperated

Following an integrated combat turn (ICT) on the day prior to this flight, a load crew installed the gun cam holdback tool, download pin, and electrical safing pin. But instead of placing the gun rounds limiter switch in the "rounds limit" position, the load crew left it in the "no limit" position. The stage was now set.

The following day, the crew chief preflighted the aircraft, but missed seeing the incorrect setting of the gun rounds switch. The pilot is also required to check the rounds limiter switch for cold gun safing during his preflight.

In this case, the mishap aircraft was a spare. When the pilot ground aborted his assigned jet, he went to the mishap spare. To compensate for lost time, he rushed his preflight. In the process, he missed seeing the incorrect position of the rounds limiter switch.



Although triple redundant safety systems are relied on to prevent inadvertent gunfire in the F-15, this mishap and others in the past prove the gun can still fire.

If the rounds limiter switch is placed in "no limit," or the counter is set at 799 or less, the gun will still rotate, regardless of other safing systems. When the gun rotated in this mishap, due to the incorrect setting, the cam holdback tool vibrated free. The electrical safing pin streamer was pulled into the gun system, pulling the pin free of the electrical safing switch. When both the mechanical and electrical safety circuits were disabled, the gun fired!

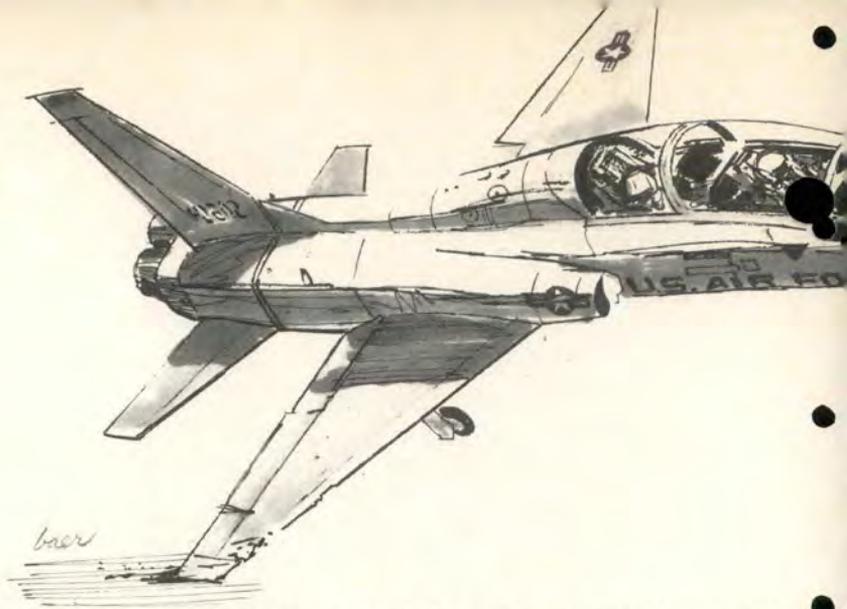
Imagine if another aircraft had been in the path of the firing gun! Needless to say, everyone who had anything to do with setting or checking the gun system prior to this flight blushed when they found out the causes.

Lessons Learned

Cooperation is nice . . . but not when we cooperate in a high accident potential explosive mishap.

By paying attention to little things like the checklist and correctly setting the rounds limiter switch, we can prevent \$6,000 damage bills to gun systems. Even more important, we will probably save someone's life. ■

Life in the



MAJOR ROGER L. JACKS

Tuesday, 1000

■ "Hey, Bruce, our T-38 cross-country for this weekend has been approved."

"No kidding," replied Bruce. "Did scheduling slip up and do something good for us? No, wait a minute. What's the catch?"

"The catch is we get the aircraft at 1600 on Friday, we have to log 12 hours of time, and have the bird back by 1400 on Sunday."

"See, I told you those guys are regular Simon Legrees — that's eight hops!" quipped Bruce.

"Yeah! The way I see it, we'll have to two-hop it Friday, four-hop it Saturday, and then two-hop home on Sunday. We'll have to watch our crew duty day restrictions on Friday and be prepared for a long day on Saturday."

"You can say that again. I've got two simulator rides on Friday — one of them is a check ride. It will be a long day, but I wouldn't pass up a chance to get away for a couple of days."

"I hear what you're saying, Bruce. I'm ready for a change of scenery myself. I'll get in touch with you tomorrow, and we'll set a time to do a little mission planning."

Friday 1430

"Well, Bruce, how did the simulator periods turn out?"

"Man, I'm beat. Johnson gave me

every malfunction in the book. I passed the ride, but I think I must have sweated a bucket of blood. How's your day going?"

"Not too bad. I really get ticked at scheduling sometimes when they keep me on the dead run for days at a time. I have projects sitting on my desk in stan eval that need immediate attention, but I just can't get to them — maybe Monday — at any rate, let's get the show on the road. I hear Randolph has a good Friday night crowd at the O Club."

With that, the aviators of our story filed their paperwork, completed their preflight, fired up their airplane, and launched out on their weekend cross-country. Both hops on that Friday afternoon were uneventful. Doug and Bruce arrived at their destination around 2000. Base transportation got them to their quarters around 2100 and, by 2130, Doug and Bruce were cleaned up and ready for a night out on the town.

Since they were getting started a little late and were facing an early go on Saturday, they made the decision to skip dinner and head on over to the Club bar to see if they could run into any of their old buddies. They figured that a bar snack or two would get them through until morning.

As luck would have it, the Club bar was swinging, and several of their old buddies were in the crowd. Doug and Bruce had a great time and couldn't believe the time of night it was when people started drifting out of the club. Since they

had the early takeoff, they hadn't been drinking, but both, by this time, were experiencing a great deal of fatigue. They agreed to meet at Base Ops at 0700.

Saturday, 0700

"Morning, Doug, hope I look better than you do!"

"I've felt better, but I'm OK. You don't look like a ball of fire either. Let's hope we don't have any hassles today — a good airplane, clear skies, and fast turnarounds."

"Roger that! Remember, we've promised the gang at Willie we'd meet them for dinner tonight."

"Yeah! I haven't seen some of those guys in a couple of years. Well, let's get it on!"

Things did not go as smoothly as Doug and Bruce had hoped. In fact, it turned out to be a frustrating day. Breakfast came out of a vending machine at Base Ops — stale, but filling. On the first hop, no. 1 engine refused to start. After an hour delay, maintenance found the problem, and the crew was on their way. On hop number two, the front seat ADI failed on the ground during pre-taxi checks; another hour delay. By now, both airmen were getting a little uptight as mission accomplishment, crew goals, and social commitments were getting closer to a mental collision.

In an effort to save time, Doug and Bruce decided to forego a designated lunch break. Rather, they would grab something while the aircraft was being serviced. A half-

FAST LANE



After pushing too hard to enjoy the weekend, he laid his head back on the headrest and sighed a breath of relief — “Boy! What a weekend!” . . . Suddenly Doug shouted, “My rudder pedals have gone full forward!! I can’t hold her!!”

cooked, greasy burger and a Coke were the end result. The last two sorties went well mechanically; however, the weather turned bad.

Doug and Bruce took turns piloting the aircraft around thunderstorms and putting up with light-to-moderate turbulence. Poor visibility, heavy rain, and turbulence made the final landing of the day nerve-racking and capped a long, fatiguing day. They were a little late for their dinner party, but things worked out well. Maybe too well, because it turned out to be another late night for our two aviators.

Sunday, 0700

“Whew! I’m really glad we’re heading home. I think I’ll head right for the rack and sleep until Monday morning!”

“Not a bad idea, Bruce! This has been quite a grind. Fun! But boy, I’m whipped! Well, we’ve only got two hops to make today, so let’s take it easy. If we get back a little late, we’ll just take the blame — no sense pushing it. I think we did enough pushing yesterday!”

The first hop went well. On time, no mechanical problems, and good weather along the entire route. Things were going even smoother on the last hop. Doug was flying the aircraft, his mind jumping from subject to subject, but mostly how tired he was and how nice it would be to unstrap that airplane from his behind and relax on his own couch with an ice-cold beer.

Bruce was trying to get a little

ahead of the game and complete the 781 entries. As they approached their home field, they contacted the base and got the weather. Not too bad, some gusty crosswinds, but good visibility. Doug, in the front seat, would make the final landing. Two miles from touchdown and everything looked good. Bruce took a quick check of the instruments, a fast glance outside, and assured himself they were in good shape. He laid his head back on the headrest and sighed a breath of relief. “Boy! What a weekend!” he thought to himself, as his mind replayed the weekend activities. By this time, the aircraft was nearing the approach lights.

Suddenly Doug shouted, “My rudder pedals have gone full forward!! I can’t hold her!!!”

Bruce, brought back to reality by Doug’s emotion-filled statement, tried to grasp the predicament they were in, but his senses had been dulled by fatigue and inattention. His mind had finally comprehended the situation, and his body had started to correct the problem when the right wing impacted the runway. With a lot of luck and some timely skill, Doug and Bruce managed to bring the damaged aircraft to a stop without incurring any physical injuries to themselves.

An investigation revealed the rudder interconnect cable had failed, causing the front cockpit rudder pedals to go full forward. The rear set of rudder pedals was completely functional.

Could this mishap have been

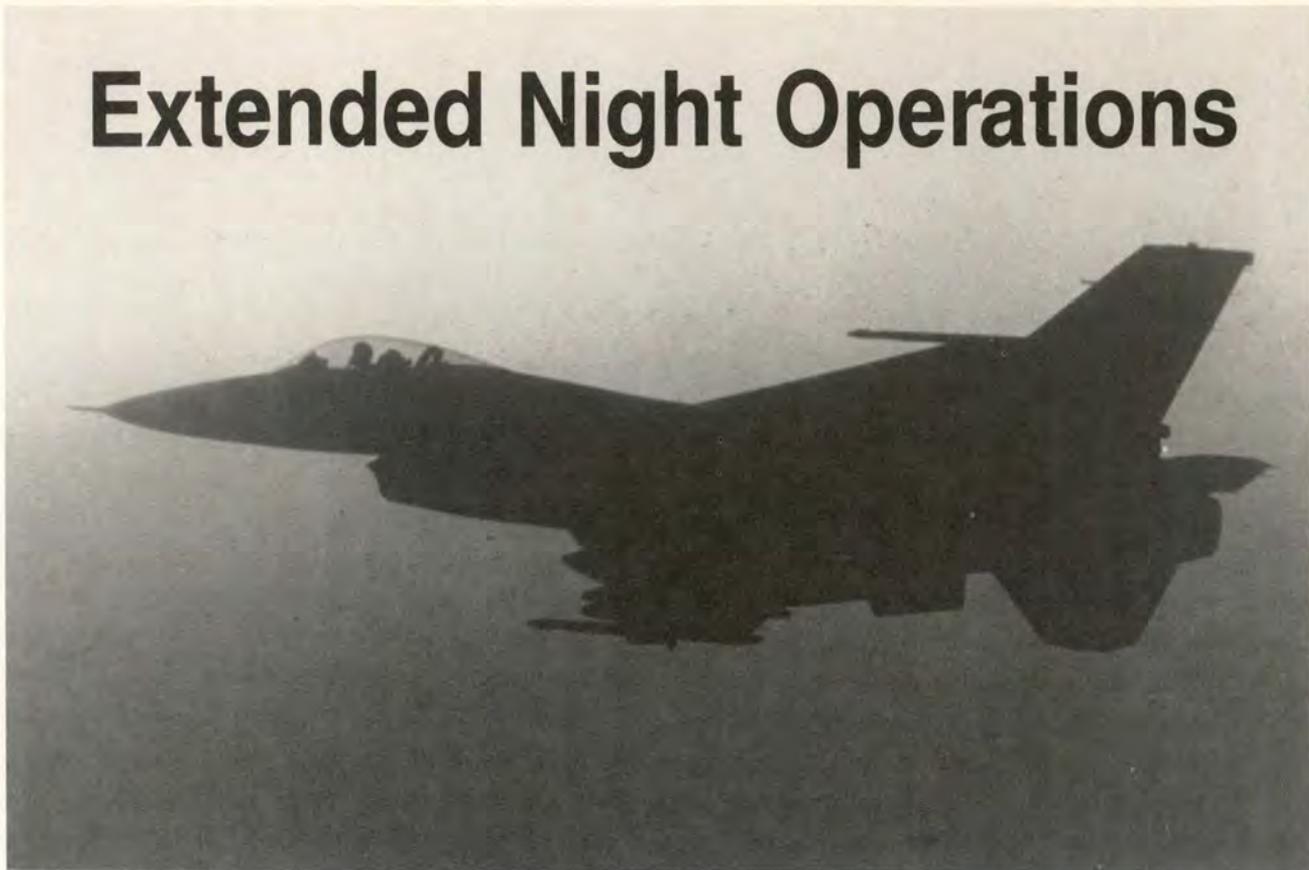
prevented? Yes. Did chronic fatigue play a part? Probably, but we’ll never be able to measure its full impact. Behavioral scientists tell us chronic fatigue can cause the following effects:

- Increase in error potential.
- Increase in reaction time.
- Deterioration in timing.
- Increase in willingness to accept lower standards.
- Breakdown of instrument scanning patterns.
- Tendency to neglect relevant cues.
- Roughness on flight controls.
- Preoccupation with discomforts.
- Attention span reduced.
- Important elements overlooked.
- Lack of objectivity or reliability when asked to reconstruct what has occurred.

There are many other things that can produce chronic fatigue. Behavioral scientists group these cause factors into three groups: Psychological, pathological (disease), and physiological. This article has been directed to physiologically induced fatigue, which is basically not getting enough rest, exercise, or proper nutrition. We can all ensure that we get the right amount of all three. All it takes is a little planning and a lot of self-control.

Give yourself a break when you go to fly. Be physically fit! You’ll definitely be more mentally capable of coping with the potential Murphies that may be coming your way. ■

Extended Night Operations



MAJOR DON HUDSON
Chief, Aerospace Medicine
140 TFW, Colorado ANG
Buckley ANG Base
Aurora, Colorado

CAPT PETER F. DEMITRY, MC, FS
A-10 Pilot Physician
354th Medical Group Myrtle Beach
Myrtle Beach AFB, South Carolina

Recent technologies are heralding a new tactical era and exposing an old assortment of human factor problems.

■ With the impending introduction of LANTIRN and other new night enabling technologies, operational units will be faced with the specter of sustained night operations for the first time under peacetime constraints. With the exception of F-111 attack wings and certain strategic and airlift operations, night missions are an infrequent event in most units.

In the past, night missions have been flown only during contingen-

cy situations (Libya) or by specialized units on a more routine basis. This article will present some of the lessons learned from these operations and discuss research accomplished at NASA-Ames which examines the effects of fatigue on pilot performance. Everyone who reads this will view it from their own perspective — the unit commanders, other key unit supervisors, the schedulers, flight surgeons, aviation psychologists, operations, and line pilots will all be challenged by the human factor problems presented by nighttime operations.

An operational squadron that flies a 60 percent/40 percent day/night mix of sorties will have difficulty countering the effects of acute sleep loss and resultant fatigue, similar to shift workers in other occupations (figure 1 is an explanation of the observed physiology). As we saw in our research at NASA, sleep loss and fatigue lead to predictable performance degradations in pilots in the following order: Complacency, computational and navigational er-

rors, and communication errors.

By complacency, we are referring to the easier acceptance of substandard performance; that is, 10 feet altitude deviations become 30 or 40 feet instead of immediately correcting the discrepancy. Also impaired are mathematical and abstraction abilities crucial to accurate navigation, situational awareness, and mission accomplishment. (Remember the last time you flew tired and attempted to compute the number of seconds to an action point, recomputed MIL settings, or computed the proper lead point during an arc-to-radial segment of an instrument approach procedure?

In close trail with those first two problems are communication errors. (What did the controller just say?) During the NASA-Ames study, we observed on numerous occasions pilots read back and then fly not what the controller said, but what the pilot expected the controller to say. A degradation in any of these areas can start or continue a pilot down a sequence of events leading to a mishap.

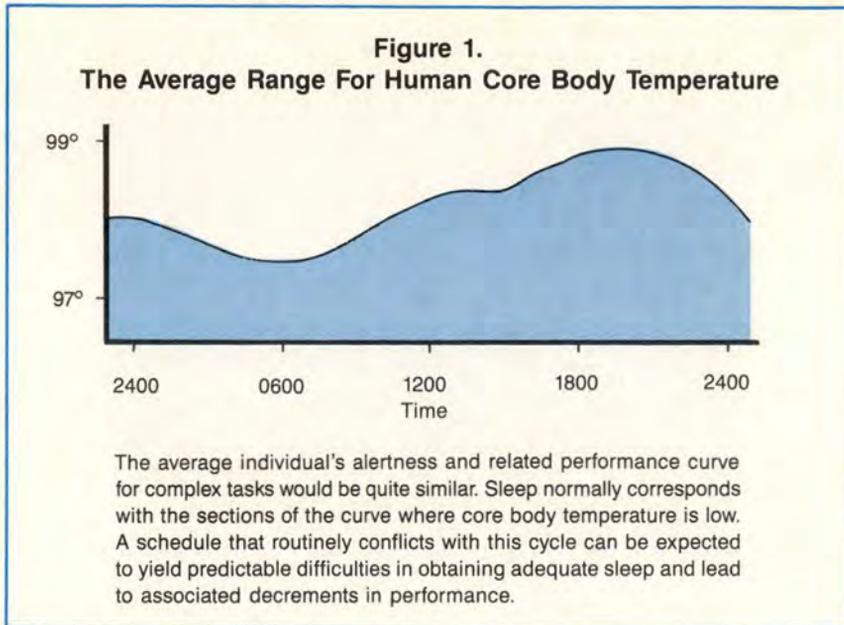
The new technologies are impressive and will make 200-foot night low-level missions a distinct possibility. During a 200-foot night low-level, the safety margin is small even when aircrew performance is optimal.

What can be done to counteract the insidious effects of fatigue in night operations? The essential first step must be to tie scheduling to a firmer understanding of sleep physiology. For example, in an operational squadron that has pilots landing after 2000 hours, we recommend, mission permitting, that the following scheduling guidelines be considered:

- **Fourteen-Hour Rule.** The pilot should have 14 hours crew rest from completion of his last official duty.

- **Block Scheduling.** The month's quota of required night sorties should be flown on consecutive evenings, forming a block which allows the individual to more easily adjust to the shift. This 14-hour rule is important because although a pilot may be at home by 2400, most require a half-hour "wind down" period before sleep is likely. While this also occurs after daylight sorties, this phenomenon becomes destructive when it interferes with the normal sleep pattern.

- **No-Go Option.** The individual pilot must retain the freedom to decline a mission without fear of retribution. Commanders must con-



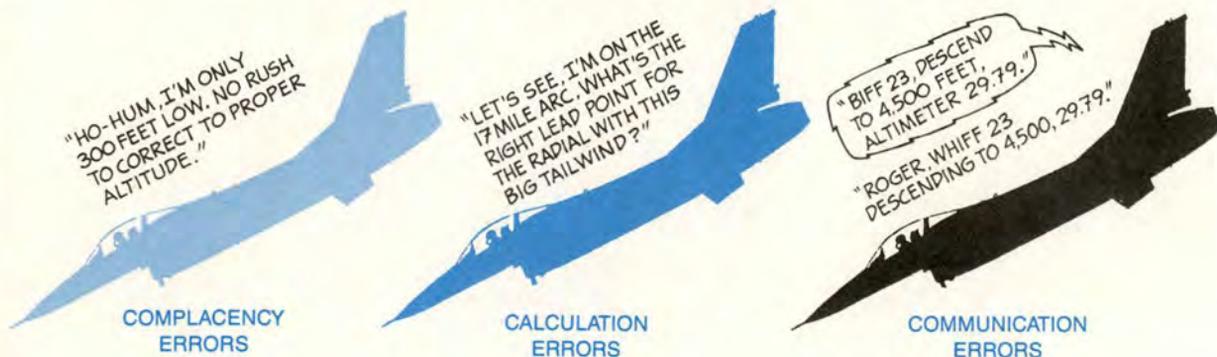
tinue to support the nonpunitive system which allows any aircrew member to take himself off the schedule if he doesn't feel up to flying that night.

During night operations, environmental and social issues will take on added importance. As much as possible, base facilities such as the CBPO, BX, commissary, eating facilities, and the hospital will need to accommodate the increased night operations. Education of family members will be especially critical in recruiting their understanding and support. Clearly, command emphasis will be required in im-

plementing these actions.

As we enter this new era in night operations, close cooperation between the line and aeromedical community will be mandatory. Despite these new technologies, nighttime flying will not be the same as daytime flying in the foreseeable future. Failure to properly anticipate and address these issues may result in new technology and tactics outstripping our understanding of its physiological ramifications. Anticipation and proper planning can save human lives and irreplaceable wartime assets. Forewarned should be forearmed! ■

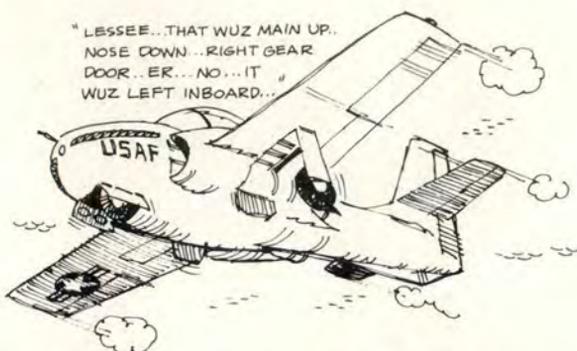
Figure 2.
The C³ Formation — A Formation Headed Towards Disaster



When a pilot is fatigued, his performance will be degraded in a predictable pattern consisting of the following triad: Increased complacency, calculation errors, and communication misinterpretations.



OPS



Three Green

■ The T-37 mission began with a pattern delay. The IP flew a normal pattern to a low approach. The student pilot then flew a practice, no flap, low approach because the RSU crew had not assumed control of the runway. On both patterns, the cockpit gear indications were three green lights and good hydraulic pressure, with no gear warning horn and no red light in the handle.

The crew were climbing out for departure to the area when the tower notified them their gear had not extended on the last approach. The RSU controller had noticed the configuration for the second approach was both main gear up, right inboard gear door down, and nose gear down. The controller was unable to contact the T-37 on guard frequency, so he had called the tower to relay the information. By the time tower called the aircraft, the student had al-

ready raised the gear.

The IP assumed control of the aircraft and requested an immediate closed pattern. On inside downwind, he configured the aircraft and once again received good cockpit indications. He flew a low approach, and the RSU crew confirmed all three gear down. They departed the pattern and were joined by a chase ship for a closer look at the gear. The chase pilot confirmed the gear down and locked and all indications normal. The IP then flew an uneventful ILS full stop.

Postflight inspection revealed the mechanical linkage from the landing gear handle to the selector valve was out of rig. This made it necessary for the handle to be placed all the way to the bottom of the handle slot before the main gear would extend. The IP remembered the student caught the fingertip of his glove underneath the gear handle when he lowered the gear. Maintenance also found the right main gear se-

quence valve was out of rig, and both main gear down lock switches had high electrical resistance. Additionally, they found

corrosion on one connecting bus to the gear handle red light. The aircraft has experienced no further gear problems.



Autopilot Failure

The FB-111A flew in pitch autopilot altitude hold submode at 19,000 feet for 1½ hours without incident. The pilot disengaged the altitude hold, descended to 11,000 feet, and re-engaged altitude hold.

The aircraft immediately pitched over 20 to 30 degrees into a negative 2- to 3-G descent and lost 700 feet before the pilot could depress the autopilot release lever to recover control. The pilot turned

off the pitch damper and landed the aircraft without further incident.

After landing, the pilot re-engaged altitude hold for the auto flight control specialist, and the horizontal stabs drove down rapidly for two engagements, but thereafter performed normally. Troubleshooting failed to duplicate the malfunction or indicate any failures. The pitch and yaw computers and CADC were replaced, and the aircraft was flown successfully.

WANTED — Safety Electronic Board Users

The Data Analysis Branch at the Air Force Inspection and Safety Center now has a toll free number for access to their daily updated mishap data. Requirements are a need to know, a computer, and a 1200/2400 BAUD Modem. You must send your access requests through numbered air force or major command safety offices for validation. Offices in Alaska, Hawaii, and CONUS (except California) use 1-800 343-0280. California residents continue to use 1-714-382-2703.

TOPICS



There's the Beef

A C-141B was making a PAR approach at an overseas base at dusk and had received clearance to land from GCA. Just prior to decision height, the command post advised the aircraft there were cows on the runway.

The crew flew a missed approach, but couldn't see the cows until passing directly over them. Be-

cause of darkness, tower controllers didn't see the black-and-white cows until the aircraft executed the missed approach.

The cows had been spotted by the vice commander who was making a routine visit to the flight line. He called the command post who then called the aircraft. The cows had pushed through the perimeter fence.



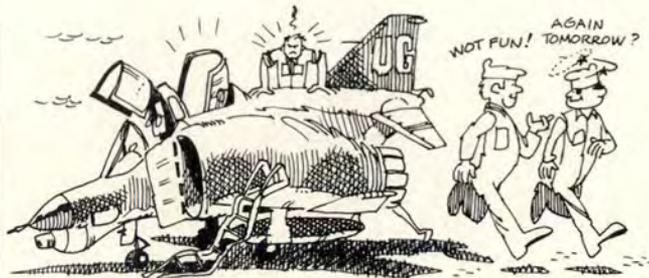
Target Defenses?

While on a low-level bomb run, the crew of a B-52 saw a small flock of birds slightly below their altitude. They began evasive action, but heard a bird strike the aircraft.

The no. 1 generator tripped off line, no. 1 fuel flow decreased to 1,200 gph, and no. 2 EPR froze at 1.8. Suspecting engine

damage, the pilots shut down engines 1 and 2 and aborted the mission.

After landing, the crew discovered a 20-inch hole in the leading edge of the left wing, with damage to generator cables, wiring bundles, and two wing ribs. The wiring damage had caused false indications of engine problems.



Never Volunteer

An F-4 aircrew was performing their preflight. While attempting to pull the drag chute streamer, the wire snapped. Attempts to remove the wire and open the drag chute door manually were unsuccessful.

At this point, the WSO volunteered to open the drag chute door by pulling the drag chute handle in the front cockpit. Being in a hurry to meet the scheduled takeoff time, he rushed his attempt and lost his balance on the maintenance ladder, falling into the front cockpit. While trying to break his fall, he unintentionally hit the arresting hook deploy

handle, deploying the hook.

Recovering from the episode, the WSO sat on the ladder with his legs outside the aircraft. The ladder had been hooked over the canopy sill, as usual. To be sure the crew chief was not behind the drag chute door, the WSO had turned to the left to lean out over the aircraft. To maintain his balance, he reached for the windscreen, but got the emergency canopy jettison instead. The canopy thrusters fired and catapulted the ladder and WSO 1 or 2 feet into the air. Both came back to rest on the aircraft without damage or injury. At this point, the crew left the area.



Min Run Landing

An RF-4C returned from a low-level flight for an instrument approach and an overhead pattern to a full stop. Everything went fine until touchdown.

The Phantom touched down first on the center-line external tank, then the two wing-mounted external tanks. It seems the crew missed one item in the before-landing checklist — the gear. ■

MAINTENANCE MATTERS



HE YELLED FIRE!

A maintenance crew was dispatched to install an engine into a jet fighter. The team used one composite toolkit (CTK).

Following the engine installation, it was time to perform the leak and ops check. But prior to the engine run, it is necessary to check the engine inlet and area around it for foreign objects, as well as to perform an inventory of the CTK. Although no one completed either of these requirements, the team supervisor signed off the aircraft forms, certifying the inspection was complete.

One of the technicians climbed into the cockpit and started the engine. Approximately 30 seconds into the run, a ground crewmember saw flames exit the tailpipe, yelled "fire," and directed the engine be shut down.

Investigation revealed that two sets of pliers, a pair of duckbills, and a pair of dykes were ingested into the engine. Damage to the fan module and other components exceeded \$70,000!

No jet engine is immune to damage when it is forced to swallow something that wasn't designed to go down its throat. Inlet and CTK inspections are a must if we hope to guarantee any noticeable degree of immunity from foreign object damage (FOD).

A conscientious effort on the part of everyone concerned is required to keep FOD costs from increasing.

NO SAFETY WIRE

Following takeoff, a fighter pilot saw the right engine fire light illuminate. He accomplished the appropriate emergency procedures and landed the aircraft.

The postflight maintenance investigation revealed fire and heat damage to the right engine and bay area. Further investigation disclosed a missing cap from the afterburner fuel line. It was found in the engine bay.

During the previous phase inspection, technicians had performed extensive maintenance on the right engine. For an undetermined reason, someone removed the safety lockwire to the fuel cap and didn't replace it. There was no writeup for this in the aircraft forms. Other engine specialists, supervisors, and quality assurance inspectors also overlooked the missing lockwire during required inspections.



Following the phase, the aircraft was towed to the trim pad where an engine leak check was completed.

When the pilot selected afterburner for takeoff, fuel pressure and vibrations caused the afterburner fuel line cap to completely back off. This allowed fuel to spray and start an intense fire. Fire and heat damage to the engine and associated bay area totaled almost \$80,000. It also cost 960 man-hours to perform the needed repairs.

Errors of this nature are preventable through good maintenance practices, common sense, and thorough inspections. Remember the

role that safety lockwire serves — to keep things like fuel caps in their place. And don't forget the importance of proper documentation.

This flight mishap had the potential to be catastrophic. Fortunately, because of a skilled pilot, it wasn't.

Mishap prevention is not something separate or additional to the regular job. It requires weaving safe work procedures into every phase of what we do.



Bay 5 Calamity

When the F-15 pilot reached for the landing gear control handle after takeoff, the canopy suddenly moved up and aft, departing the aircraft. Fortunately, the pilot landed the Eagle jet uneventfully.

Prior to the mishap flight, maintenance people had packed Bay 5 (the empty area behind the ejection seat in a single-seat F-15) with an integrated drive generator and aircrew bags which were all secured with bungee cord. Since neither the crew chief nor the pilot ensured the required clearance from the top of the baggage to the canopy mounted "catcher's mitt," a portion of the baggage was pulled forward and trapped in this area when the canopy was closed. Use of the F-15 Bay 5 hard-sided container or soft bag would have secured the baggage properly. The unauthorized use of bungee cord allowed the stored items to shift as the canopy moved forward, thus preventing the canopy from fully locking. During takeoff, the canopy moved aft, unlocking the canopy hold down hook from their securing rollers.

MAINTENANCE MATTERS

Although F-15 maintenance people do not receive formal training on properly packing the Eagle's Bay 5, they need to remember bungee cord is not authorized for use in securing items in this area.



FOD IS EVERYONE'S BUSINESS

Following an uneventful flight, two jet fighters were in the dearm area. While moving about the first aircraft, a member of the end-of-runway (EOR) weapons crew unknowingly dropped a safing pin and attached streamer in front of the engine inlet. No one saw this, and the pilot never got any abnormal engine instrument readings.

Once the aircraft weapons systems were safed, the pilots taxied back to their respective parking spots using normal taxi spacing.

Postflight inspections revealed severe engine foreign object damage (FOD) to both aircraft. Investigators theorized the metallic engine debris from the ingested safing pin exited the first taxiing aircraft and was ingested into the second one.

Further investigation indicated the EOR crews were in the habit of walking around aircraft with several pins in their hands, rather than properly stowing the pins in the pin bags. Since this mishap, they have changed those procedures.

FOD is everyone's business. If FOD prevention is going to work, everyone in the unit must be on the lookout and take responsibility for eliminating hazardous procedures that could cause FOD.



ATTENTION TO DETAIL

Just prior to conducting air refueling, the tanker's boom operator smelled what he thought to be fuel in the boom pod area. He searched the area, but couldn't find any liquid residue. Since the fumes persisted, the aircraft commander decided to abort the mission and return to base.

Initial postflight investigation was uneventful. But when the maintenance folks recalled that the big bird had just been repainted, they searched further.

Behind some interior insulation in the boom pod area, they found a rag soaked with paint remover!

There have been a number of incidents where aircrews have aborted missions due to interior fumes from either paint, solvents, or glue. Performing thorough inspections for things like solvent-soaked rags, as well as allowing sufficient time for fumes to dissipate, are necessary to prevent physiological mishaps and aborted missions like this.

In the end, it is the attention to detail that makes the difference. Mission success and flight safety depend on it.

Humpty Dumpty

The weapons load crew was dispatched to load an A-10 with six MK82 general purpose bombs. The bombs were delivered on an MHU-110 trailer. The load crew chief installed metal rollers in settings 1 and 2A of the jammer table. This caused the bombs to have a nose-down attitude when they were lifted from

the trailer. The crew loaded three of the 500-pounders without incident.

But their luck ran out when they placed the MJ-1 under the fourth bomb. As it was lifted 2 to 3 inches to allow the tiedown strap to be installed, the table caught on the extender rails of the trailer. When the table broke free, the bomb slid off of the rollers and hit the ramp nose first. The fuze, booster, and M-9 delay were removed and destroyed by EOD.



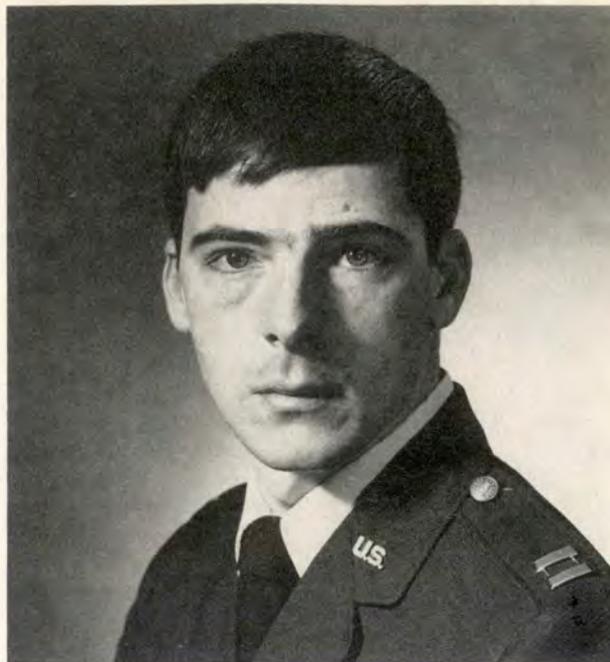
This mishap occurred because the load crew chief did not follow tech data and standardized procedures. He thought that roller settings 1 and 2A were optional for metal rollers. However, as the crew chief found out after he was recertified, these are only optional settings when using rubber rollers.

The TO specifies that the rollers are to be installed in settings 1 and 1A. In the weapons business, failure to follow tech data and standardized procedures can lead to a deadly experience. This time the load crew was lucky. They learned a lesson and undoubtedly gained some notoriety.



UNITED STATES AIR FORCE

Well Done Award



CAPTAIN

Richard A. Reynolds

**614th Tactical Fighter Squadron
Torrejon AB, Spain**

*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.*

■ On 25 February 1988, Captain Richard A. Reynolds successfully recovered his distressed F-16A. He was tasked, during a demanding surge, to fly a full-scale weapons delivery mission when his F-16 sustained severe thrust loss during the low altitude, single-ship, and high speed ingress with a heavily configured aircraft. He applied the appropriate emergency procedures and zoomed his aircraft, thus trading excess airspeed for needed altitude.

Capt Reynolds turned toward the nearest suitable airfield 60 nautical miles away. He rapidly analyzed engine instrument readings and aircraft controllability, while computing optimum glide speed and referencing his position in relationship to the ground so his flight lead could quickly join with him.

Capt Reynolds' situation was further compounded by poor weather conditions. He was forced to make the majority of the recovery to the unfamiliar airfield with reference only to his aircraft instruments.

Upon join-up, the flight lead noted the aft section of Capt Reynolds' engine was missing and his speed brakes had minor damage. While 23 nautical miles from the airfield and unable to maintain altitude, Capt Reynolds maneuvered his aircraft over an uninhabited area to safely jettison his external fuel tanks.

Still unable to maintain the altitude needed to glide to the field for an overhead-pattern flameout landing, Capt Reynolds elected to attempt a difficult straight-in flameout approach. He established himself on a steep glide slope using minimal thrust. While contending with this very adverse situation, Capt Reynolds made an uneventful approach and landing.

Capt Reynolds' professionalism and superior airmanship prevented the loss of a valuable combat aircraft. WELL DONE! ■



UNITED STATES AIR FORCE

Well Done Award



CAPTAIN

Kenneth J. Vantiger

**27th Tactical Fighter Wing
Cannon AFB, New Mexico**



CAPTAIN

Thomas E. Carlson

**27th Tactical Fighter Wing
Cannon AFB, New Mexico**

■ On 13 February 1988, F-111 crew Captain Kenneth J. Vantiger, Aircraft Commander, and Captain Thomas E. Carlson, Weapon Systems Officer, were approaching Eglin AFB, Florida. While descending and turning to enter initial, Capt Vantiger felt a glitch in the control stick. Seconds later, the stick moved full right, and the aircraft rapidly rolled right. Both crewmembers grabbed the stick, applied full left force, and stopped the roll in 80 to 90 degrees of right bank. The stick would not move left past the centered position, and rudder was required to get the aircraft back to wings level. Checklist procedures were accomplished, but the full right stick deflection persisted. A left, 5-degree rudder turn was the most the crew could safely maintain.

The crew continued a turn and started a slow climb to 6,000 feet for a controllability check. Capt Vantiger estimated his turn rate would align the aircraft for a straight-in approach.

With gear down, the aircraft oscillated in pitch, but remained controllable. As the flaps were extended, pitch oscillations increased. When Capt Vantiger selected 25 degree flaps, violent pitch oscillations occurred and nearly placed the aircraft out of control. The pitch finally stabilized, and the aircrew elected to leave the flaps at 25 degrees.

As they began final approach, only rudder control was available. Without the yaw damper, the nose of the aircraft wandered 5 to 10 degrees left and right of course throughout the approach, requiring continuous rudder inputs. Unequal rudder forces made runway alignment extremely difficult, and at one point on 8-mile final, resulted in a severe yaw oscillation. Over the runway threshold, the right wing made an uncommanded drop and a quick rudder input brought it up, but drifted the aircraft to the left edge of the runway for landing. Capt Vantiger successfully landed the aircraft with no damage.

Captains Vantiger's and Carlson's superb airmanship prevented the loss of a valuable combat resource. WELL DONE! ■

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.

ZAP

THE DEADLY FORCE OF LIGHTNING

See page 8

