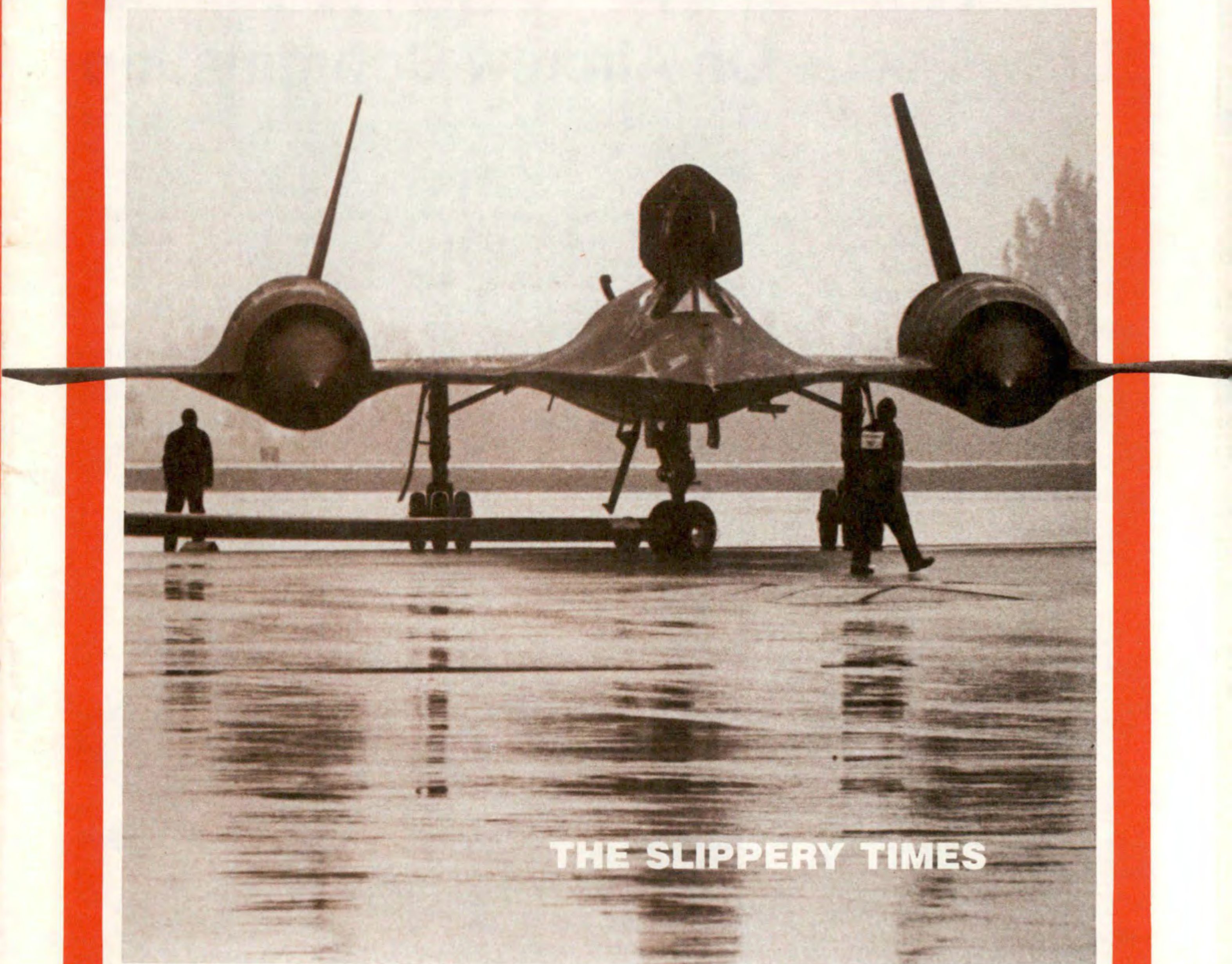
flying

SAFETY

MARCH 1988



New Focus On Aircrew Coordination

LT GEN JOHN A. SHAUD
Commander, Air Training Command
Randolph AFB, Texas

■ Successful flying in a multicrew aircraft requires the same basic skills as in a single-seat fighter, plus coordinated action by the crewmembers. Much of the crew coordination process is also relevant to a formation of fighters, but there is a critical difference. The pilot of a multicrew aircraft has a group of people *inside* his or her airplane who are needed and hired to make positive contributions to the flight. Success in flying such aircraft depends on effectively coordinating the efforts of those people. Crew coordination is gaining more attention in Air Training Command as we move toward specialized flying training for future crewmembers.

Simply stated, aircrew leadership results in aircrew coordination. But just how important is aircrew coordination? A look at several past mishaps provides a clear view of what we are really talking about when we use the term.

- A civilian airliner was over the Everglades when the crew became so preoccupied with a burned-out instrument panel light bulb that they failed to monitor all the other gauges. No one noticed the autopilot had disengaged. Seconds before the plane crashed, the first officer asked his captain, "We're still at 2,000 feet, right?" **Problem:** Improper task prioritization.
- A military cargo plane was on short final for landing when the pilot observed a dangerous situation and elected to go around. When the pilot stated "takeoff power," the flight engineer did just that. He reduced power on all engines, and the aircraft crashed short of the runway. **Problem:** Ineffective communication.
- A pilot of a military aircraft, while flying a night circling approach, allowed the aircraft altitude and airspeed to decrease below that required for a safe approach. He initiated a go-around and immediately called for the flaps to be raised. Without questioning the pilot's decision, the copilot raised the flaps, and the aircraft stalled and crashed. **Problem:** Copilot syndrome.

The necessity for coordinated actions and responsibilities is not unique to flying, but there is probably no other arena in which the consequences of failure are more immediate and severe. To quote Chuck Yeager, "You can't be complacent. Because, man, the final word is, 'complacency will kill you,' and it's that simple." continued

The interaction of leading and following among crewmembers keeps communication lines open — ensuring effective aircrew coordination and mission success.

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, OSAF

PURPOSE — *Flying Safety* is published monthly to promote aircraft mishap prevention. Use of funds for printing the publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. Facts, testimony, and conclusions of aircraft mishaps printed herein may not be construed as incriminating under Article 31 of the Uniform Code of Military Justice. All names used in mishap stories are fictitious. The contents of this magazine are nondirective and should not be construed as regulations, technical orders, or directives unless so stated. **SUBSCRIPTIONS** — For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Changes in subscription mailings should be sent to the above address. No back copies of the magazine can be furnished. **REPRINTS** — Air Force organizations may reprint articles from *Flying Safety* without further authorization. Non-Air Force organizations must advise the Editor of the intended use of the material prior to reprinting. Such action will ensure complete accuracy of material amended in light of most recent developments. **DISTRIBUTION** — 1 copy for every 12 aircrew, aircrew support, and maintenance personnel. Air Force units must contact their base PDO to establish or change requirements. AFSP 127-2 is entered as a publication at the Second-Class rate (USPS No. 586-410) at San Bernardino Postal Service, 1331 South E Street, San Bernardino, CA 92403 and additional entries.

New Focus On Aircrew Coordination continued

As ATC implements its new Tanker-Transport Training System, even more emphasis on the dynamics of task prioritization and crew coordination will be necessary. Aircrew coordination training will command a high priority.

Effective crew coordination means no crewmember is a passenger. Each has individual responsibilities, but must function as part of, and support the crew as a whole. This will be the focus of training.

Providing flying training involves more than just teaching basic stick and rudder flying skills. It also involves establishing the right mindset, and that must include instilling a healthy understanding of the need for crew leadership, crew discipline, and crew coordination. From the beginning, we must teach such complex skills as task prioritization and the critical interaction of leading and following as part of an aircraft crew.

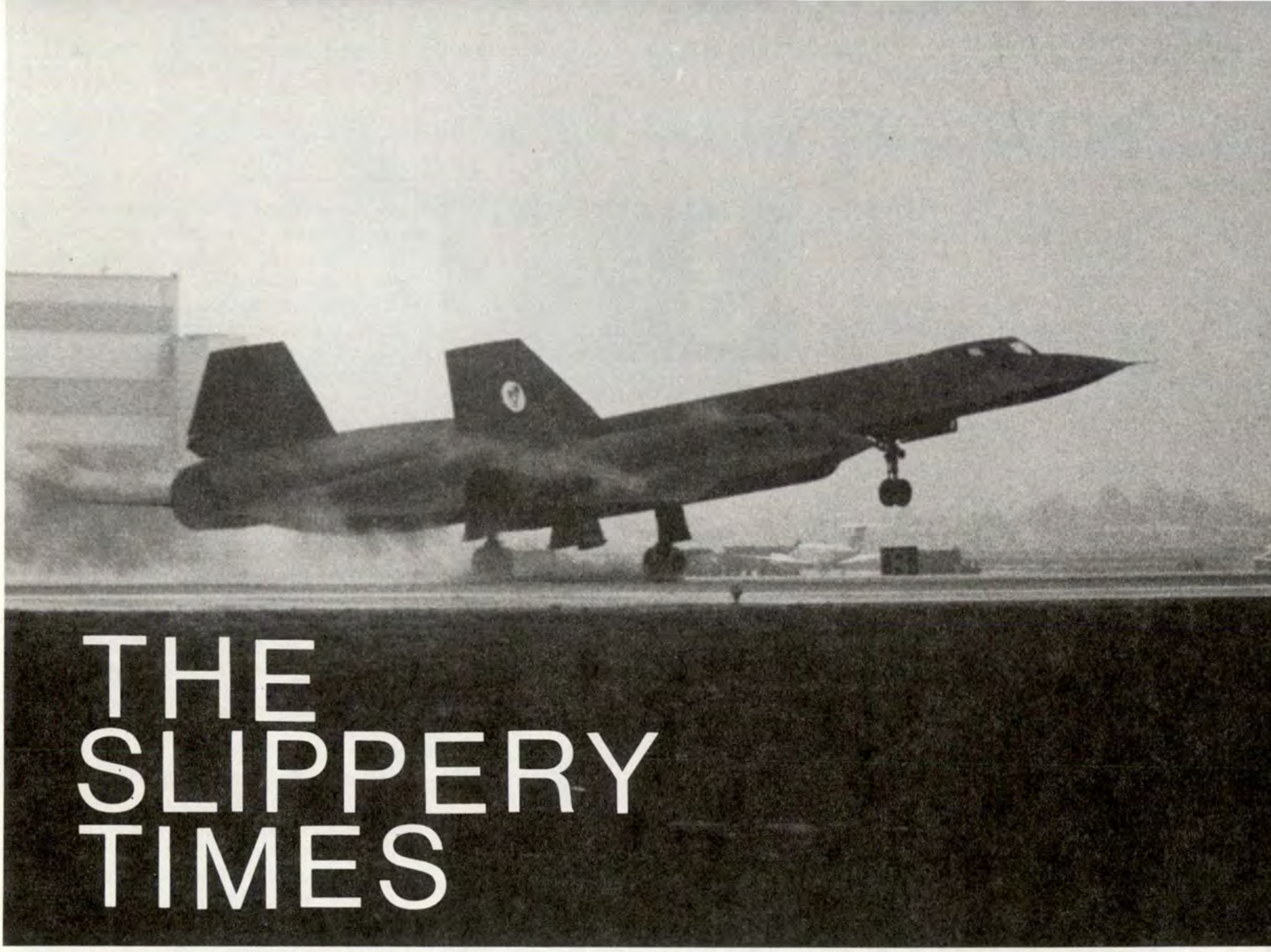
This has always been an important aspect of our flying training programs. Soon, it will be even more important as we implement a new training system designed specifically for aircraft crewmembers. The Tanker-Transport Training System (TTTS) will permit ATC to train crew leadership in a multiengine aircraft system for the first time since we retired the World War II vintage B-25 in 1959.

To be certain we instill the right attitudes about aircrew coordination as we move to this new system, we are studying other aircrew coordination training programs in use today. Approaches like MAC's Mission-Oriented Simulator Training System and those used in the commercial airline arena offer elements which will help us develop and implement aircrew coordination training in our own undergraduate flying syllabus. Rest assured we won't neglect our traditional emphasis on basic flying skills.

These basic skills remind us of two time-proven essentials for aviation success. First, you, the pilot, must be on top of everything — know your machine and its limits — know yourself and your limits, and be able to recognize when a dangerous situation occurs. The second requirement, equally essential, is to have the courage and skill to act.

While both of these abilities are essential for any pilot, they achieve new levels of importance and complexity in multicrew aircraft; thus, aircrew coordination training commands a high priority. Our training will reflect this importance. We will teach the student pilot to judge an aircraft's capabilities and limits, to avoid distraction, to keep sight of the main objective, and to function as part of the command relationship that must naturally exist within an aircrew. We must deeply instill the understanding that the capability to act decisively, as individuals and as a crew, spells the difference between failure and mission success. Indeed, it spells the difference between life and death.

Air Training Command has continually refined both the skills and attitudes we instill in new pilots and navigators, keeping the training relevant to the challenges the young aviators will face in today's Air Force cockpits. Through the years, ATC has prepared aspiring aviators to make the most of their individual talents and skills. As we move into a new era in pilot training with the TTTS, we continue that process of refinement. This time, it means renewed emphasis on aviation's equivalent of team play — aircrew coordination. ■



THE SLIPPERY TIMES

Aviation safety researchers have conducted a great deal of study and testing on the subject of hydroplaning. Also, articles appear regularly in many safety publications. Still, our mishap files at AFISC tell us each year hydroplaning continues to cause us problems — and mishaps. "The Slippery Times" summarizes some important facts and prevention tips our researchers and safety professionals say will help us avoid the pitfalls of hydroplaning.

PEGGY E. HODGE
Assistant Editor

■ March is here and a change of season is upon us. The snow is melting and rain storms are more prevalent. Temperatures are starting to warm in the day, yet may still be quite cold at night. Expect a lot of ice under these conditions as melting snow or rain freezes during the night. Wet and icy runways spell hydroplaning and problems for our crewmembers. To supplement the review of your Dash One — let's take the time to go over a few basic facts and prevention tips to help us through "The Slippery Times!"

Three Types

Let's start by defining the three types of hydroplaning: Dynamic, viscous, and reverted rubber.

1

Dynamic hydroplaning occurs when a fluid separates the tires from the runway surface. Under this condition, the pressure between the tires and the runway lift the tires off the runway surface to the extent that a non-rotating tire, such as you have when landing, will not spin up after touchdown, or a rolling (unbraked) tire will slow in rotation and may actually come to a stop. Under these conditions, the coefficient of friction is reduced to zero, making wheel braking, tire cornering, and nose wheel steering totally ineffective.

The threshold for dynamic hydroplaning is usually thought of as nine times the square root of the tire

continued

The Slippery Times continued

pressure ($9\sqrt{P}$). This applies when the tire is rotating. If your tire is not rotating, is locked, or has stopped spinning, the threshold is different — $7.7\sqrt{P}$. Therefore, in some aircraft, the touchdown speed is always within the dynamic hydroplaning range.

As the depth of water on the runway and the tread wear increase, the minimum speed for dynamic hydroplaning is even lower. Since the tread groove is lessened, the tire can cut through less water. If you're landing with worn tires on a runway with standing water, the speed at which dynamic hydroplaning could occur is well below $7.7\sqrt{P}$.

Even if dynamic hydroplaning is arrested, the aircraft is still susceptible to viscous and reverted rubber hydroplaning.

2

Viscous hydroplaning, otherwise known as skidding, occurs only on runways that have a smooth surface texture or a runway surface made smooth by rubber deposits or paint. A tire on these surfaces can only partially displace the trapped water film. Even a light dew can produce viscous hydroplaning on a very smooth runway surface.

Recovery while experiencing viscous hydroplaning is speed-dependent and may not be achieved until the aircraft decelerates to a very low ground speed of about 40 or even 30 knots.

3

Reverted rubber hydroplaning occurs only if the wheels are locked and a prolonged skid develops. It takes very little molten rubber to make this happen.

This type of hydroplaning is considered worst of the three types because extremely low traction can persist down to zero speed. More importantly, with the wheels locked, the tires lose all cornering capability, and directional control is nil unless you get off the brakes and get the tires rotating again. Once they spin up, you will regain cornering capability and can effectively use nose wheel steering and/or aerodynamic controls. You will also want to start feeling out the brakes again to get your aircraft stopped.

Be aware that an aircraft can very readily pass from one type of hydroplaning into the next. As an example, an aircraft could start dynamic hydroplaning, and, as a result, the wheels might spin down. Application of brakes could cause a wheel to remain stopped (locked) and, thus, progress into reverted rubber hydroplaning.

Crosswinds

While we're on the subject of taking off and landing on wet or icy runways — let's briefly address crosswinds.

Avoid crosswind landings on a flooded or slippery runway whenever you can. Crosswinds acting against the upwind fuselage surfaces and vertical tail create a side force tending to push the aircraft toward the downwind side of the runway, in addition to tending to weathercock the nose into the wind. The only force available to counteract the windage is the friction of the tires on the pavement — and there may not be any!

On takeoff, you can yaw the aircraft into the wind as you feel the tires lose sidewise friction and continue the takeoff without damaging the tires. (But remember this is not true on *dry* runways.) The demands of landing are a little trickier. Landing on the upwind side of the runway makes the full runway width available for any sliding during the transition speed period.

Takeoffs in conditions of extreme crosswind should be made with caution. When lift-off speed is greater than hydroplaning speed, the aircraft is subjected to the effects of crosswind while hydroplaning.

Prevention

Now that we've refreshed your memory on the three types of hydroplaning — what can you do to avoid them?

In general, hydroplaning can best be avoided by using normal landing procedures, touching down firmly, and using aerodynamic braking to slow the aircraft before gently applying the wheel brakes. After the nose is lowered to the runway, apply the brakes carefully being sure *not to lock them!*

The following aircraft and runway tips may help keep you from "slipping up!"

Braking

▪ Since reverted rubber hydroplaning occurs when the wheels are locked up, avoiding reverted rubber skids depends on improving pilot braking practices and the protection circuits in antiskid braking systems.

▪ Runway condition reports (RCR) give a good estimate of what kind of braking to expect. Even so, it is a good idea to request more information. How old is the reading? Was it taken right behind a snowplow? What is the RCR in the planned stopping zone? Has precipitation fallen since the reading was taken?

▪ Having landed, if the runway is wet or snow-covered, start braking as soon and as hard as possible without locking the brakes. Also, use as much aerodynamic braking as is available and consistent with the wind conditions. Thrust reversers are, of course, invaluable.

▪ Experience has shown that a phenomenon similar to hydroplaning can occur during high ambient temperatures with uncured tar or smooth asphalt runway surfaces. When landing on newly resealed or resurfaced runways, you might expect this condition. Under these conditions, take care during braking not to inadvertently lock the wheels as this may initiate or aggravate the phenomenon.

▪ Exercise caution in the way you apply brakes throughout your landing. The best technique is to apply smooth and steady pressure to maximize the braking force without locking your wheels.

Runway

▪ Be especially cautious when landing and taxiing on painted areas (piano keys, centerline, etc.), which tend to be slipperier than nonpainted surfaces. This is true even when they are damp.

▪ RCRs can be especially valuable in preparing incoming aircrews for the possibility of encountering hydroplaning. Remember to report runway conditions.

▪ An aborted takeoff on a wet runway initiated at or near hydroplaning speed requires considerably more runway than one aborted on a dry runway.

▪ In your preflight planning, use the IFR Supplement to learn as much as possible about your takeoff and landing runways. Keep in mind such factors as runway length, type of surface, overrun availability, type and location of arresting gear, runway gradient, and "zero zone" size (the distance from the end to the first marker).

▪ Clearly, landing uphill is preferable if wind conditions permit. A concrete runway is better than an asphalt runway if trying to avoid viscous hydroplaning. If the surface is grooved, this will help water escape from under the tires and prevent dynamic hydroplaning.

▪ When hydroplaning past runway markers, it may help to know exactly how much runway is left. You also need to know when to drop the tail hook to engage the arresting gear.

▪ Review crosswind limitations on an ice-covered runway.

Tires

▪ Be aware of tire condition. Insist tires have adequate tread depth and proper inflation pressure.

▪ An underinflated tire is more likely to hydroplane than one properly inflated. (According to studies, reverted rubber skids are limited to aircraft using high tire inflation pressures.)

▪ Tread grooves must have sufficient depth to allow water to pass under the tires.

▪ Smooth tires tend to hydroplane with as little as .25cm of water and possibly at lower speeds.

▪ Ribbed tires tend to release hydrodynamic pressures and will not hydroplane until water depth is .5 to .75cm.

A Joint Effort

Not only can pilots help to prevent hydroplaning . . .

▪ Maintenance people can reduce the hazards of hydroplaning by adhering strictly to proper maintenance practices in checking, inflating, and replacing tires.

▪ Base operators can improve safety on slippery runways by a conscientious program of cleaning and conditioning runway and taxiway surfaces for optimum traction texture.

▪ Air traffic controllers, approach controllers, and tower and ground control people should be alert for changes in the weather, runway conditions, and direction and velocity of crosswinds.

The Inevitable

We all have and we all will land on wet or icy runways. It happens so frequently we must not become complacent — always keep your guard up — especially during "The Slippery Times." ■

From Principles To Practice

■ The bomber was making a standard penetration and approach in IMC. Just as the pilots started to reset the altimeters to the destination setting, the copilot thought he saw a fire warning light on. They tested the circuit, looked for signs of fire, and finally decided the copilot was mistaken.

By this time, they were nearing their level-off altitude of 3,000 feet for the TACAN approach. The pilot called level at 3,000 feet and seconds later, the aircraft impacted the top of a hill at 1,640 feet. That little mistake of forgetting to reset the altimeters cost the entire crew their lives . . . **or would have if they had been in an actual aircraft instead of the simulator.**

The Name of the Game is "Realism in Simulators from Mishap Lessons Learned" at SAC's 93d Bombardment Wing.

AUGUST W. HARTUNG
Directorate of Aerospace Safety

■ In our Air Force today, simulators are an indispensable part of every aircrew's training program. In the early days of aviation, attempts to fly heavier-than-air machines often resulted in a tremendous loss of people and equipment. In the early 50s, the Air Force experienced about 140 major flight mishaps a month at a rate of 36 per 100,000 flying hours. In 1987, we averaged less than 4.5 mishaps per month at a mishap rate of 1.51 per 100,000 flying hours. Getting to this point might not have been possible without the advances in our flight simulators.

With our dependence on teamwork aboard the "heavy aircraft," it isn't just the pilot who must be trained. Instruction for all crewmembers is an important part of our mishap prevention program. And throughout our Air Force, much of that instruction comes by way of simulators.

SAC's 93d Bombardment Wing (BMW) at Castle AFB, California, has parlayed their operational instructor experience, lessons learned from actual mishaps, and technical experience with simulators into one of the most advanced "school houses" for our bomber and tanker force seen to date.

93d Bombardment Wing's Mission

The primary mission of the 93 BMW is to maintain the capability for long-range strategic bombardment operations. Unlike most SAC bombardment wings, the 93 BMW is also a "school house" with the monumental task of providing initial qualification training to all B-52 Stratofortress and KC-135 Stratotanker aircrew members in SAC.

The basic combat crew training course is divided into two parts — the academic phase and the flight phase. The 329th Combat Crew Training Squadron (CCTS) provides the academic training, while the 93d Air Refueling Squadron and 328th Bombardment Squadron provide flight training in the KC-135 and B-52 aircraft respectively.

A Training Success Story

Significant to the 93 BMW's training program is their use of lessons learned from previous mishaps. They incorporate those lessons into the academic phase, simulator, and even the actual flight phase of training. The wing has a mishap review panel which meets quarterly and may also meet after a Class A or B mishap.

The panel includes representatives from the safety office, members of various curriculum and training development sections, instructor crewmembers, simulator staff, flying squadron commanders, and the flight surgeon. The primary purpose of this "lessons learned" program is to prevent a repeat of a mishap. It incorporates necessary changes *immediately*.

"We review real-world incidents by going over the narrative, findings, and causes of past mishaps," explained the 93d's chief of safety, Major Jim Shanley. "We want to answer two questions: First, do we train that item adequately here in the 93d right now? If we do, fine. But if the experts in the room feel our training might not be adequate to prevent a recurrence of the mishap we're discussing, then we ask, 'What can we do to improve it?' We then formalize these recommendations and implement them in the applicable areas of instruction. We may add a section to an academic course, cockpit procedures trainer or simulator, flying phase, or all of them."

So the 93 BMW continues to refine their training by making necessary changes where and when needed. This enables them to keep programs *current*. Major Shanley sees a tremendous benefit in monitoring the B-52 and KC-135 training and including the lessons learned from previous mishaps. This is especially beneficial in the simulators where the crewmembers can perform the "hands-on" flying.

When asked about the contribution of simulators to the wing's superb training program, Major Shanley saw many advantages. "In addition to the economy of the training, there are many things we can do in the simulator that would involve a good margin of risk in the aircraft. We can practice three or four engine-out approaches and flaps-up landings over and over again. We can expose our crewmembers to these and other situations and train them to a level that's acceptable. We don't have to run the risk of exposing an entire crew to a dangerous situation in the aircraft, because we can accomplish the same objective in a simulator."

The chief of safety went on to explain a personal experience he observed with a crew in the B-52 simulator. He recalled one crew who was flying a simulated terrain avoidance mission. They came to a very tricky part of the route involving a big turn followed by a substantial climb. Due to not properly dividing their attention, they overbanked the aircraft

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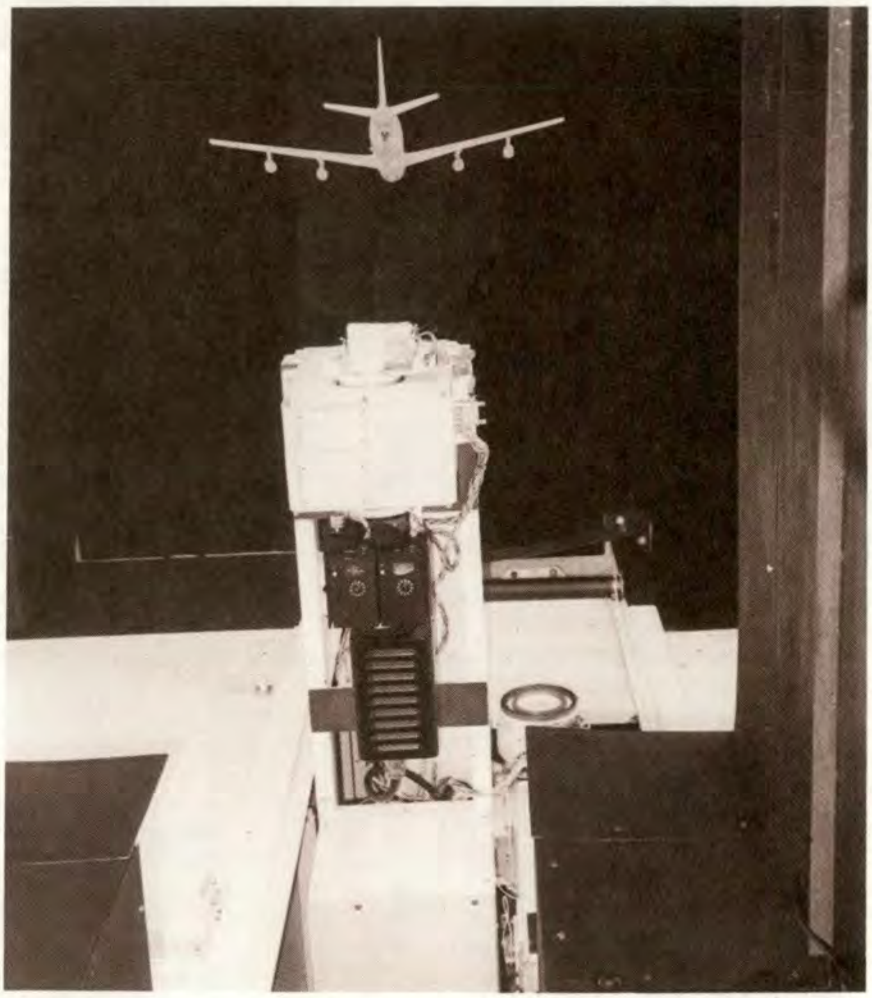


Air refueling mishaps can be simulated effectively thanks to this camera aimed at a KC-135 model. The amplified view is transmitted to the cockpit window display in the flight simulator to give the flight crew a realistic view.

Linebacker II Training Center — "Where it all begins." All SAC crewmembers will pass through this building and spend time in the flight simulators on their way to aircrew qualification in the B-52 and KC-135 aircraft.

and ended up crashing . . . in the simulator. Major Shanley said the crewmembers' silence was very telling. They subsequently talked about it for half an hour.

"Later the pilot who was with the crew came up to me and told me how valuable that piece of training was, because the crew had learned the lesson themselves, a valuable lesson," remarked Major Shanley. "I flew an actual mission with that same crew the next day and they were absolutely perfect. They had shared a frightening experience together in the simulator, and it was very effective."

Academic Training Each year, the 329 CCTS trains approximately 120 bomber crews and 200 tanker crews for assignment to units throughout SAC. This totals approximately 780 bomber and 730 tanker crewmembers. At any one time, approximately 500 students are assigned to the 329 CCTS for administrative purposes during their stay at Castle.

Instructors design and produce most of the course materials used in the school, always integrating the latest "lessons learned" from the wing's mishap review panel.

Linebacker II Training Center The 93 BMW is home of a very unique facility known as the Linebacker II Training Center. Dedicated as a memorial to SAC air and ground members who participated in the "Linebacker II" aerial bombardment operation during the war in Southeast Asia, the Center houses some of the Air Force's latest flight simulators. The B-52 and KC-135 Weapon System Trainers (WST) might be described as the most complicated and advanced simulators ever produced.

Towering on hydraulic struts, the WSTs have a "freedom of motion" system designed to give students the "feel of flying" and incorporate advanced computer components to electronically simulate all the functions of the actual aircraft. This includes all radar and visual operations as well.

The WSTs are precisely representative of their particular B-52 and KC-135 aircraft counterparts, and their cockpits or flight decks are indistinguishable from the real thing. The WSTs are also the first flight simulators to integrate all crew positions in the B-52 and KC-135 aircraft, so that a crew may "fly" an entire mission together without leaving the ground.

Lieutenant Colonel Al Osborn, Chief of Aircrew Training Devices at the 93 BMW with a phenomenal 5,300 flying hours as a B-52 pilot, explained, "One aspect of our job is to meet the immediate demands of problems that come up. If we have mishaps or specific things to address, we focus on how we need to change our training. Because our weapon system trainers are so advanced and can fly like the actual B-52 or KC-135, we can turn to them for assistance."

Flight Training Once the student aircrew members complete their academic and advanced simulator training, it's time to hit the flightline to actually fly either the B-52 or KC-135 aircraft.

The 328th Bombardment Squadron (BMS) conducts all in-flight B-52G instruction, while the 93d Air

Refueling Squadron (ARS) provides training for both the KC-135A and KC-135R model aircraft. Both units' highly qualified instructors are handpicked from throughout SAC.

Integrating the weapon system trainer and other synthetic trainers in a complex flight training program, the 328th instructors teach inflight refueling, celestial navigation, defensive tactics, and low-altitude terrain avoidance navigation and bombing tactics. Additionally, the instructor crewmembers maintain combat readiness in support of the command's conventional tasking and Emergency War Order Mission.

Asked what changes he has seen flight simulators make in mishap prevention, Captain Paul Dejulio, instructor pilot in the 328th, explained, "What we're finding out now in the B-52 WST are different techniques and ways to reinforce the proper procedures to get the crew out of a potentially dangerous situation. This is especially true in asymmetric flight conditions where a crew might have abandoned their bomber before. We can put the entire crew inside the simulator and give them a tremendous amount of hands-on training never technologically feasible in the past. Without a doubt, all of this has had a direct impact on the Air Force mishap prevention program."

The 93 ARS not only provides KC-135 combat crew training for all pilots, navigators, and boom operators entering SAC's crew force, but for Military Airlift Command, Air Force Systems Command, Air Force Reserve, and Air National Guard units as well. This equates to approximately 900 students each year.

Captain Bob Ireland, a 93d instructor pilot who has over 2,400 flying hours and 900 instructor hours in the KC-135 explains his role this way: "We teach system malfunctions while interfacing potential aircraft mishaps. We review mishaps that have actually occurred, giving students the same type of cockpit indications that a crew may actually have in flight and letting them react to the situation. We use a lot of crosstell information from our wing safety office and squadron safety meetings, as well as including our own instructor staff experience in teaching.

Towering on hydraulic struts, the weapon system trainers used by the 93d Bombardment Wing are described as the most complicated and advanced simulators ever produced. They allow very realistic simulation of past mishaps for extremely effective training.

"We emphasize past mishaps in our training syllabus and relate them to what our crewmembers might actually encounter in the aircraft. We use the lessons learned from actual mishap board conclusions and really emphasize those points."

Captain Robert Lesmerises, Chief of Curriculum Development for the KC-135 WST, explained, "The key ingredients here are crew coordination, pacing, and timing — and doing it all safely."

Crew Coordination

Explaining the importance of crew coordination to mishap prevention, Lieutenant Colonel Osborn said that without the initial emphasis in this area, a crew might start off on the wrong foot. Whether it be in the B-52 or the KC-135, aircrews not only learn their own responsibilities, but also are cognizant of what the entire crew should be doing as a team. This is a key ingredient in the mishap prevention process.

With SAC's traditional dependence on teamwork, it isn't just the pilot who must be trained. Therefore, instruction for other rated crewmembers such as the navigators and radar navigators mingles with pilot instruction. The same goes for the gunners in the B-52s and the boom operators in the KC-135s. Throughout the 93d's "school house," crew coordination is heavily stressed.

Major Robert Miller, B-52 flight safety officer, explained, "It takes a lot of crew coordination to fly a heavy aircraft, especially the B-52. The entire crew always needs to be talking to one another while they're executing their procedures. Basically, what we want to do is make sure the 'co-pilot syndrome' doesn't occur. We don't want an inexperienced copilot or other crewmember seeing a deviation and not saying anything to the aircraft commander (AC).

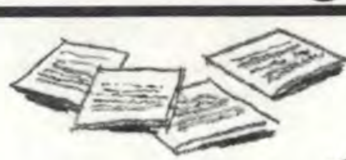
"This can happen when the AC might have a lot of flying time in the aircraft, and perhaps the crew doesn't want to hurt his feelings or offend him. In essence, we teach our crewmembers to 'shout it out' if they see a deviation, so the AC can make the correct response and avoid a potentially critical situation." (See "When In Doubt, Shout It Out," *Flying Safety*, October 1987.)

The End Result

Clearly, the 93d Bombardment Wing at Castle AFB takes its training tasks seriously, and Colonel J.C. Wilson, Jr., Commander 93 BMW, is pleased with their results. "The success of our training philosophy," he told *Flying Safety*, "has become very evident over the years, and we're more than satisfied with the quality of the crewmembers who leave here." ■

ROBERT R. SINGLETON
55 ARRS
Eglin AFB, Florida

Ralph's Four Napkins: Worth Reading



■ Friday, 14 August, another night in the spirit world's "Aircrew Lounge." I slowly wound my way over to the giant screen TV. Tonight's show featured live coverage of in-processing at an aircrew training course. I don't think any of us watching were at all concerned with whether it was an Air Force, Navy, or Marine school; whether it was an F-18, C-130, or B-1 class; or whether those in-processing were pilots, navs, loads, or any other particular crew position. They were aircrew, that was enough for us.

I took a seat on the nearest empty stool and turned to Doug. He had been a C-130 loadmaster, and a good one. Without giving it much thought, I asked him, "Say, Doug, what would you tell them (nodding my head toward the TV screen) if you had the chance?"

"That's a good question, Robbie." He thought a minute, and continued, "Whatever it was, I'd want to make sure it was the best piece of advice I could possibly offer. Being a spirit is nice, but no sense becoming one any earlier than necessary."

It didn't take long before a few of us had a real good discussion going. If there was one thing we'd pass on that would apply to all aircraft, all crew positions — what would it be?

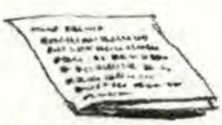
Would we emphasize procedures? Would we emphasize systems knowledge, proper crew rest, the hazards of IMC and spatial disorientation, alcohol, or visual illusions, particular techniques, or tactics? The consensus was a negative to all the above. They were all either adequately covered in earth-bound guidance, or not applicable to all aircraft, all crew positions.

Steve, an old C-130 nav, began to vent some frustration. "There is no way we can provide a one-liner to *all* aircraft, *all* crew positions. Those people have systems, technology, procedures, and missions we don't even know about. The only thing we have in common with them is people, and even they have changed. Any advice we might give would be outdated, obsolete."

"People," I had stopped listening after "people." Without knowing it, Steve had hit the nail on the head. What did *we* have in common? I looked about me — Doug, the C-130 load; Dale, the Eagle driver; Steve, the C-130 nav; JJ, the Marine pilot; and Ralph, the H-60 driver. What did we have in common? People.

Every preflight, every flight, every postflight — every flight planning session, every debrief — People. We should tell them about people. But what to tell them? Steve had stated that the aircrews of today were somehow different, with a lot more technology and sophistication. "That might be true," I thought, "but regardless of aircraft or crew position, people are people; always have been, always will be."

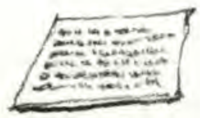
A few of us retired to the bar, refilled our glasses, grabbed a napkin and began jotting down ideas. Some early agreements came to the fore; a lot of it based on experience. After all, we were all spirits. How do you get to be a spirit — you die — a number of us had done so in airplanes. We knew what we were talking about.



The First Napkin

The napkin began to take on a life of its own . . .

- Truth: Often the younger fliers knew something the older fliers didn't know.
- Truth: Often the less experienced fliers knew something the more experienced fliers didn't know.
- Truth: Often the copilot knew something the aircraft commander didn't know.
- Truth: Often the navigator knew the aircraft systems answer that the flight engineer didn't know; or the radio operator knew the flight procedure answer that the pilot didn't know.
- Truth: Often the ground crew knew something the aircrew didn't know.
- Truth: Often the HH-53 crews knew something the C-130 crew didn't know.



The Second Napkin

On to the second napkin for the "Findings . . ."

- Finding: Often the one who knew the answer wasn't asked.
- Finding: Often the one who knew the answer didn't speak up.
- Finding: Often the one who knew the answer *did* speak up and wasn't listened to.
- Finding: Often the one who knew the answer, who did speak up, who was listened to, was subsequently ignored.
- Finding: Often if the one who knew the answer *had* been asked; if the one who knew the answer *had* spoken up; if the one who had spoken up *had* been listened to — the aircrew would have lived to fly again, rather than scribbling on napkins in the Spirits' Aircrew Lounge.

The Third Napkin

It was time for the third napkin. We put the heading "Why" at the top of this one.

- Why: People assume the older know, the younger should learn. Why ask the younger? Why listen to the younger?
- Why: People assume the experienced know, the inexperienced should learn. Why ask the inexperienced? Why listen to the inexperienced?
- Why: People assume qualification equals knowledge and judgment; the higher have it, the lower don't. Why ask the less qualified? Why listen to the less qualified?
- Why: People assume knowledge is area specific. Why ask the radio operator a pilot question? Why listen when the radio operator gives a pilot answer? Why ask the navigator an aircraft systems question? Why listen when the navigator gives an aircraft systems answer?
- Why: People can be reluctant to speak up if younger, less experienced, possessed of lower crew qualification, or operating out of their area.
- Why: People will *choose* to *not* listen, acknowledge, or act upon the thoughts of another crewmember.

Three napkins. The crowd was thinning. We topped off our glasses, kicked back, and reflected a while. We had all experienced each of these truths at one time or another. Each of us knew someone in the Spirits' Aircrew Lounge who had come to be here as a result of one of these truths. We had stumbled on something big; we could *feel* it.

"OK, we have identified some 'truths' and some 'whys,' what now?"

The Fourth Napkin

The *last* napkin — *our* message to those folks on the TV screen; the *one* message we could give:

- Make *no* assumptions regarding what the people around you can contribute.
- If you *must* make an assumption regarding what the people around you can contribute, assume they have an unlimited potential to contribute in a positive manner.
- Remain blind to age, experience, qualification, and area of expertise.
- Focus on, and listen to, *what* is being said, *not* on *who* is saying it.
- Know, and never forget, that *everyone* knows *something* about *everything*. They just may know the missing piece to your puzzle.
- Know, and never forget, that while being a free-floating spirit may be nice, life is worth living. It is worth the moment to ask. It is worth the moment to listen.
- Know, and never forget, that ego and pride can kill. The other person may be right, you may be wrong. The other person may know more than you. Accept it, be thankful, learn from it.
- In all your words and actions, demonstrate your belief in the above, *and live to fly again.* ■

Safety Warrior

Whatever Happened To Capt Ernie Walker?

CAPTAIN STEPHEN M. MORRISETTE
6th Strategic Wing
Eielson AFB, Alaska

■ The mystery started on the night of 11 January 1952 when Captain Harvey S. Tilton, pilot; Captain Ernie Walker, copilot; Sergeant Charles Medina, flight engineer; Airman Second Class Oscar Provencher, radio operator; and Airman Second Class Glen Mellon, student radio operator, flew a C-47 into the cold arctic night — never to return. This is the story of that fateful night and the tragic deaths of these five airmen.

The mission was to be a routine night instrument training mission, just another proficiency flight. They had enough fuel on board for an 8-hour flight.

OK at First

A light snow was falling as Captain Tilton piloted the red-tailed C-47 into the night sky at 1818 hours. He headed for Fairbanks as he began the climb to 11,000 feet. At Fairbanks, he turned north and headed for Umiat. He tuned his ADF radio to KFAR and watched the ADF needle swing near the bottom of the dial. A deflection of the needle made it quite obvious there was a strong west wind blowing, but it didn't take long to set up a good wind correction angle.

The Gooney Bird was a popular aircraft with those that flew it. Although warm and comfortable, the C-47 was anything but quiet. Some people compared a flight in a C-47 to that of a flight inside a bass drum. To add to the engine noise and wind noise, there was the noise of the radios.

It was probable that, in addition to KFAR, the crewmembers were listening to other air-to-air and air-to-ground communications, talking to each other on the intercom, and Captains Tilton and Walker were also listening to the constant background tones of either a Morse Code "A" (dit-da) or an "N" (da-dit).

These Morse signals were the audible part of the Radio Ranging System that was the primary means of navigation in the 1940s and 1950s. They were the only thing Captain Tilton would be able to depend on for guidance that night — just that steady stream of dots and dashes in his headset.

Confusion

The flight was apparently uneventful until shortly after passing over Bettles. Captain Tilton reported he was experiencing a 90-degree wind correction angle and was flying back to Bettles to reorient himself on the southeast leg of the Bettles Radio Range. Three and one-half hours later, with over half his fuel gone, Captain Tilton requested assistance, indicating he was lost and in need of a DF steer.

Ladd Field responded. Ladd homed on Captain Tilton and gave him two vectors to positively locate him. Captain Tilton complied with both steers. Ladd then gave him a vector of 211 degrees magnetic. That steer would have brought him home, but Captain Tilton did not acknowledge these last instructions. He was confused.

He was listening to the radio range. He was sure he was on the north leg of the Northway Radio Range. That's 150 miles south of Eielson. Why should he steer 211 degrees? That would only take him further south into the mountains! Actually, he was 150 miles *north* of Eielson and the 211 degree steer would have brought him home.

How could a crew with the experience of Tilton and Walker, both World War II combat veterans, get so lost? First, it is important to understand that navigation by compass in the northern latitudes is "iffy" at best.

You must first subtract 30 degrees from your indicated heading to know which way you are really headed. In addition, most aircraft have a 1 or 2 degree correction factor to either add or subtract. Also, the whiskey compass is only good in straight and level, unaccelerated flight. The storm that night was bouncing the C-47 around pretty badly.

The 50-knot west wind would also require a wind correction angle of another 10 or 15 degrees. But crews in Alaska were trained to take all of these factors in stride. It was not these difficulties that drove Captain Tilton 300 miles off course — it was an administrative error!

On or about 11 December 1951, ground maintenance crews swung the Bettles Radio north leg 9 degrees counterclockwise from 156 degrees to 147 degrees magnetic. The magnetic variation at Bettles is −28 degrees which would cause the 180 degree true bearing to be in a different quadrant, or in plain terms, Captains Tilton and Walker were hearing *da-dit* when they knew they should have been hearing *dit-da*.

The administrative error was that the message noting this change had apparently never been received in Eielson Ops. Airmen are trained to trust their instruments. There was no way for Captains Tilton and Walker to know that their instruments, although working properly, were leading them in the opposite direction of their intended path.

Captain Tilton's confusion lay in the fact the whiskey compass told him one thing, the ADF needle told him another, and the radio range told him yet a third. Now the boys on the ground were telling him to steer in a direction that he was convinced had to be wrong!

Bail Out!

Somewhere around 6 hours into his flight, Captain Tilton must have realized he was hopelessly lost. He must have called his crew together and started to build a plan to abandon the aircraft, a plan that would not be executed until the last possible moment.

At midnight, KFAR signed off the air. About this time, Captain Tilton must have heard someone on the VHF radio and put out his last radio message, "Hearing you very weak. Do not know where I am. Receiving a strong N quad signal." About 1 hour after this broadcast, Captain Tilton gave the command to abandon ship. The plane would run out of gas within minutes. continued

This map shows how confused the crew was. Note the wide variance between where they were *supposed* to be, where they *thought* they were, and where they *really* were.

The survival kits and radio went first, then the enlisted men. Presumably, the next man out was the copilot, Captain Ernie Walker. The last man to leave the aircraft was Captain Tilton.

Can any man know what Captain Tilton was feeling or thinking as he climbed out of the left seat and walked aft. He was alone in his aircraft. It was still warm. It was still flying. The radios were still receiving signals. As he took a stance at the open cargo door, he may have looked over his right shoulder toward the cockpit. If he did, he saw what few men have seen.

It must have seemed ghostly. The empty cockpit was still bathed in red light from the instrument and area lighting. The yokes moved back and forth as if controlled by invisible hands. But there was no time for hesitation now. Every second he delayed separated Captain Tilton from his crew by hundreds of yards.

As Captain Tilton hurled himself from his C-47, the cold would have been murderous. The wind chill created by the forward motion of the C-47 and the velocity of their fall would have been over 100 degrees below zero. Almost certainly, every man was frostbitten before his parachute opened. The fear each man must have felt as he drifted earthward in absolute darkness cannot be imagined. Although dark, their descent was not silent. That 50-knot wind was howling through their shroud lines.

There was little relief once they reached the ground. The wind was still stealing the men's body heat. The storm continued to keep each man trapped in total isolation. Each had to find protection from the wind and wait for the sun to come up. That would be over 9 hours later!

About 1000 hours, the sun weakly illuminated the tundra. The storm still raged, but at least the men could see now. The wind made shouting useless. They had to find each other by simply wandering. They finally did meet up — at least four of them did. There is no evidence that Captain Walker ever teamed up with the rest of the crew.

The men built two very crude shelters which consisted of several poles with parachutes thrown over them. Parachutes were used as floors. One of the survival kits had been located and was used. Fires were built and they began to wait.

Back at Eielson and Ladd Field, men were waiting also. They were waiting for the storm to let up. For 3 more days the storm kept all aircraft in the interior of Alaska grounded, but hope was not lost. All of the crew of 249 had arctic survival training, and with any luck, they'd be found the next day.

The storm was only one problem faced by the rescue crews. Ladd's "homer" put Captain Tilton's last fix north of the base somewhere in a line drawn through Circle Hot Springs. But Captain Tilton indicated he was south of the base near Northway. Not one, but two searches would have to be conducted.

On 14 January, the storm broke and dozens of aircraft started searching for a red-tailed Gooney Bird. In all, 199 sorties were flown by dozens of aircraft from as far away as Anchorage. Day after day the planes searched both the suspected areas without a clue until on 19 January, a spotter in a search C-47 saw a star flare. The area was searched intensively but with no results.

Flight "D" of the 19 ARS became lost in broad daylight in clear weather. It seems the pilot was getting a strange signal from the Bettles Radio. It took several hours for all involved to realize that the Bettles Radio had been swung 9 degrees!

Finally, on 27 January, 15 days after the crash, the active search for C-47, tail No. 43-16249A, was terminated; the crew presumed dead.

Six Months Later

On 1 July 1952, the 10 ARS reopened the active search for 249 and its crew. The search would be concentrated in an area north of Eielson. A trapper who had been in the bush told a convincing story of an aircraft crash about 50 miles southeast of Fort Yukon. This area would be in line with the homer fix made on the night of the crash.

Planes searched the area until on 7 July, Lyle B. Otto, the pilot of a SA-16 Tri-phibian (HU-16 Albatross), spotted a red-tailed C-47 that had crashed in the area reported by the trapper. There was no sign of life.

The terrain prevented a helicopter landing. Rescuers reached the site on foot 9 July. They found 249 had crash landed on a downward sloping wooded hill. The cockpit was crushed, but the rest of the fuselage was intact. The right wing and stabilizer and both propellers were torn away. There was no post crash fire. Supplies found aboard the aircraft included arctic issue and rations. There was no evidence the crew had ever found their aircraft.

Approximately 2½ miles behind the aircraft, the searchers found two shelters. In one, they discovered the

The Eielson base theater is named after the former base special services director, Captain Ernie Walker, who disappeared without a trace on a cold winter night in 1952.

bodies of Captain Tilton and the enlisted members of his crew. They were fully clothed except for their boots and gloves which were found just outside the shelter entrance. Among the items found in the shelter was a log from Captain Tilton addressed to his commander, Colonel Moore. The log read as follows:

Col Moore,
Took off EAFB 1820 over Bettles winds causing 50 to 70 degree correction. VHF REC inop. Heavy static. Followed SE leg towards Nenana for 45 minutes on Bendix. Flying 60 to 70 degrees to stay on beam KFAR signing off next STA heard. No time for fix. Northway next beam steer for FBK. No fuel bail out in place of crash. No food, H20. Frozen hands. Bail out 0120 SAT. Send things to my wife.
I'm sorry Col. Goodby

Fire pits and other evidence led the rescue team to believe the men had survived for only several days. Approximately 165 yards south of the shelter, the search team found the Gibson Girl hung high in a tree. It appears the crew had found the radio but could not get it out of the tree.

A mile further south they found a survival kit hanging high in a tree. Evidence indicated each man had made a personal shelter before joining up. The position of these items helped the search team recreate the events of the first several days of the victims' ordeal. That is with the exception of that one unanswered question. Where was Ernie Walker?

Into History

The search for Captain Ernie Walker continued on foot and by air for another 3 weeks. During that time, not a single additional clue was discovered. It would seem that all that remained of Ernie Walker were unanswered questions. Did he survive the bail out? Did he join the other men, or did he remain separated from them? Did he strike out to find help or simply wander until he died?

During the search in January, a spotter reported flares 30 miles south of the crash. Were they a signal from Captain Walker or was it just the spotter's tired eyes playing tricks on him? There are no answers to these questions and 35 years after the fact, any evidence of the events surrounding the demise of Ernie Walker would be gone. It is doubtful that even as much as a boot nail would now remain. The death of Ernie Walker will forever remain a mystery.

On 20 November 1953, a new base theater opened at Eielson. The theater was named after the former base special services director, Captain Ernie Walker. ■

Post Script

■ The crash of 249 and the deaths of its crew have a striking number of similarities with the crash of a B-24 in Lybia during World War II. This B-24, known as the "Lady Be Good," captured the imagination of America until 1959 when her secrets were finally revealed. The following is a list of some of these similarities.

- Both aircraft became lost at night due to navigational problems.
- Both aircraft ran out of gas.
- Both aircrews bailed out of their ship, over extremely remote and hostile terrain.
- Both aircraft flew on and made survivable crash landings after the crew bailed out.
- In both cases, the aircrew never found their aircraft.
- In both cases, survival rations were on board the aircraft.
- In both cases, the crew perished because of weather extremes.
- In both cases, the wreck and crew disappeared, to be discovered later.
- In both cases, one crewman was never found. ■

LOOKS CAN BE DECEIVING

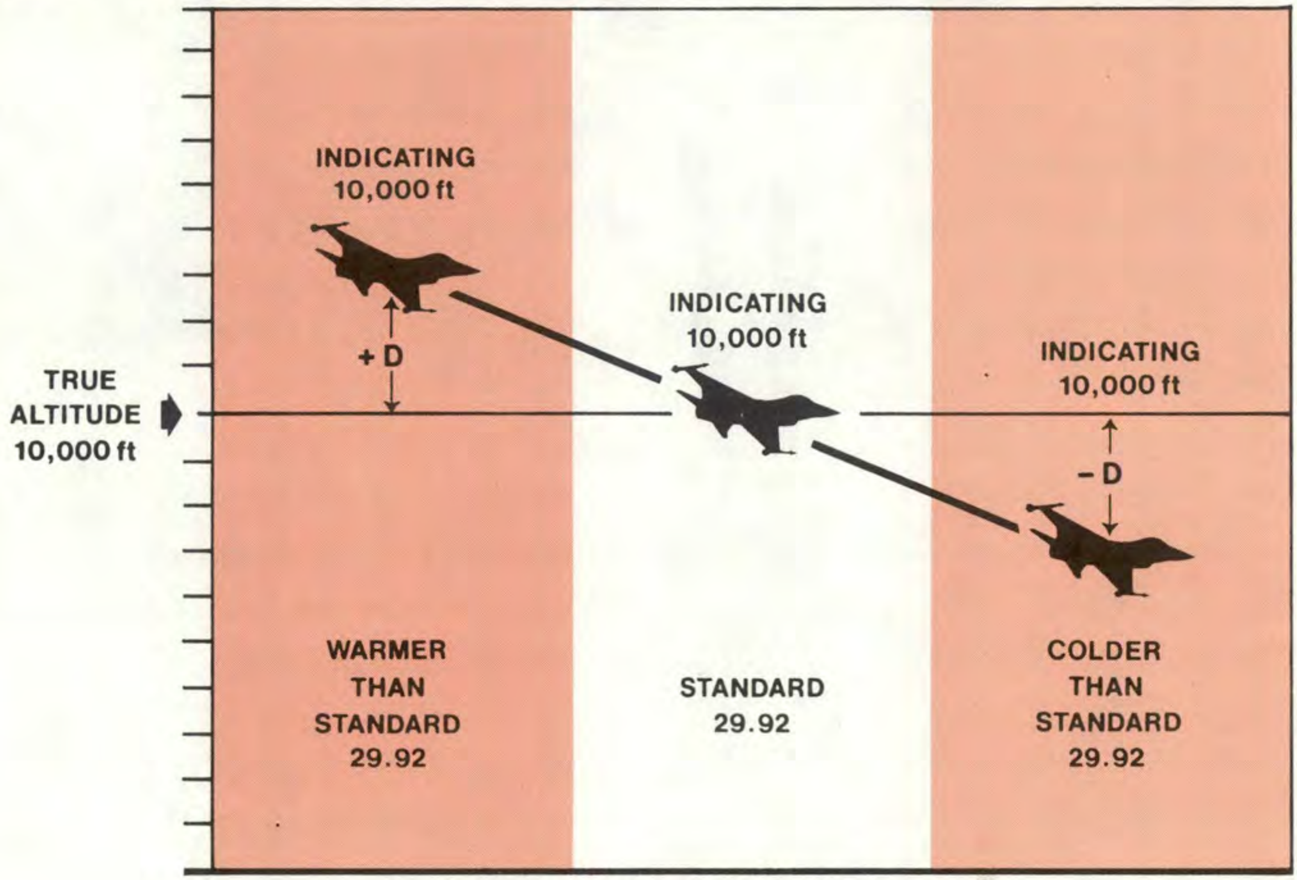


Figure 1. True altitude decreases going into cold air.

MAJOR RICHARD E. LANGDON
HQ Air Weather Service
Scott AFB, Illinois

■ A recent hazard report filed by a Canadian C-130 crew operating near Thule AB, Greenland, highlights the need for all aircrew members to be knowledgeable of basic altimetry and be aware of weather induced error in indicated altitude.

▪ A C-130, with the local altimeter set, was receiving radar vectors from Thule at the time it passed over an obstacle with less than the required obstacle clearance (ROC). In fact, the aircrew reported clearing the object by approximately 500 feet.

This is 500 feet lower than the ROC established for the minimum vectoring altitude (MVA). The error encountered was due to the colder-than-standard atmosphere temperature profile and its effects on the indicated altitude.

Standard Atmosphere

To relate air pressure to altitude, a convenient average set of values for the vertical structure of the atmosphere had to be established. This average set of conditions is known as the standard atmosphere.

As altitude increases, generally, pressure and temperature decrease. Temperature is important in various altimetry and aircraft performance computations. The standard atmosphere is used in calibrating your altimeter. Thus, the only time your altimeter displays the actual true altitude is on a standard day.

The problem, of course, is that the standard day almost never occurs, and the variations from standard that occur in the atmosphere cause a corresponding error in the altitude as shown on your altimeter (indicated altitude). In particular, let's examine closely the cold temperature error that resulted in the Canadian C-130 being approximately 500 feet lower than indicated.

Again, the conditions at the time of the incident were — temperature at Thule AB, −34 degrees centigrade, and a field elevation of 251 feet mean sea level or MSL. The C-130, using the local altimeter setting, was flying at an indicated altitude of 2,800 feet MSL and receiving radar vectors. The crew assumed the MVA of 1,000 feet above ground level or AGL assured the required terrain clearance, but they were wrong.

D-Value

They didn't understand that when flying from *warmer*-than-standard air to *colder*-than-standard air, your aircraft will generally be-

Figure 2. With respect to altitude temperature corrections, the following procedures apply:

A. Monitor ATIS. If applicable, ATC will broadcast on ATIS (if available) or upon initial contact, that altitude temperature corrections are in effect.

B. Radar vectoring altitudes assigned by ATC are temperature compensated and require no further correction.

C. For published SID and approach procedure altitudes which are below the MSA, pilots will apply corrections IAW the note below. Advise ATC how much of a correction is to be applied.

NOTE: Whenever the aerodrome air temperature is 0° celsius or less, the values derived from this chart should be added to all altitudes. However, in extremely cold temperatures, the correction values shall be added whenever the error factors equal or exceed:

A. 80 feet for DHs and MDAs (round interpolated value to nearest 10 feet). Lightly shaded area.

B. 180 feet for all procedure altitudes at or below the highest minimum safe altitude (MSA) published on the procedure (round interpolated value to nearest 100 feet). Darkly shaded area.

Unless otherwise specified, the destination aerodrome elevation is used as the elevation of the altimeter source.

TEMPERATURE CORRECTION CHART (FEET)

AERODROME TEMP °C \ HEIGHT ABOVE THE ELEVATION OF THE ALTIMETER SOURCE (FEET)	200	300	400	500	600	700	800	900	1000	1300	1500	1800	2000	2300	3000	4000	5000	10000	15000
0	0	20	20	20	40	40	40	40	60	80	90	110	120	140	160	240	300	600	900
-5	10	20	30	30	50	50	60	60	80	110	120	150	160	180	240	320	400	800	1200
-10	20	20	40	40	60	60	80	80	100	130	150	180	200	230	300	400	500	1000	1500
-15	20	30	50	50	70	80	90	100	120	160	180	220	240	280	360	480	600	1200	1800
-20	20	40	60	60	80	100	100	120	140	180	210	250	280	320	420	560	700	1400	2100
-25	30	50	60	70	90	110	120	140	160	210	240	290	320	370	480	640	800	1600	2400
-30	40	60	60	80	100	120	140	160	180	240	270	330	360	410	540	720	900	1800	2700
-35	40	60	70	90	110	130	150	180	200	260	300	360	400	460	600	800	1000	2000	3000
-40	40	60	80	100	120	140	160	200	220	290	330	400	440	510	660	880	1100	2200	3300
-45	50	70	90	110	140	160	180	210	240	310	360	430	480	550	720	960	1200	2400	3600
-50	60	80	100	120	160	180	200	220	260	340	390	470	520	600	780	1040	1300	2600	3900

EXAMPLE:
Hi TAC Rwy 11
Minot AFB, ND
Elev. 1668' MSL
Temp: Minus (−)30°C
Highest Minimum
Safe Altitude (MSA) 4200' MSL

	Altitude (MSL)	Height Above Alt. Source	Correction	Corrected Alt. (MSL)
MDA (Straight-In)	1980'	312'	+60'	2040'
MDA (Circling) (D Cat)	2220'	552'	+90'	2310'
FAF Altitude	3300'	1632'	+300'*	3600'

* 290' rounded to nearest 100'

* Editor's Note: These procedures have DOD approval and the FAA is currently investigating them.

come lower than indicated. (See figure 1.) The difference, in feet, from standard is called the D-value. As a rule of thumb, for every 5 degree centigrade variation from standard, there is a 2 percent error in indicated altitude.

In our example, on a standard day, the temperature at Thule AB would be approximately +15 degrees centigrade, but in fact, the temperature was −34 degrees centigrade which gave a variation (temperature deviation) from standard of −49 degrees centigrade.

Using our rule of thumb, the aircraft would be approximately 500 feet lower-than-indicated altitude or a negative D-value because of the colder-than-standard temperature. In this example, the indicated altitude was 2,800 feet, but the true altitude was 2,440 feet or 560 feet lower than indicated. The required obstacle clearance of 1,000 feet had been reduced to a mere 440 feet.

Application

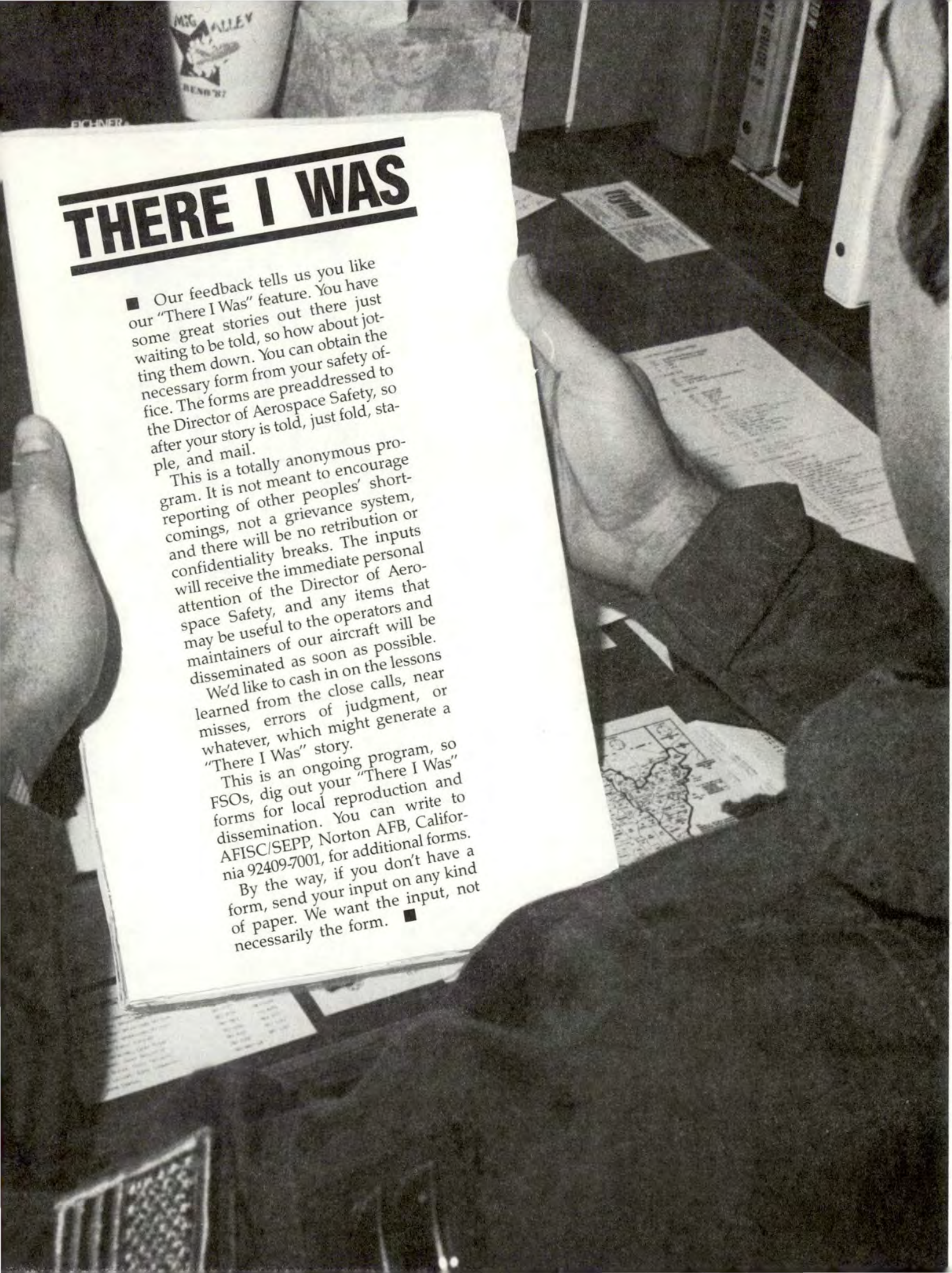
Next to the airspeed indicator, the altimeter is probably the most important basic instrument in the cockpit. Unfortunately, because of various atmospheric effects, it seldom reads the correct altitude. Mishaps have occurred during instrument flight in cold weather because aviators did not understand nor consider temperature deviations from standard and failed to allow an adequate safety margin to clear mountainous terrain.

So be aware of the D-value and what it does to your true altitude. Don't blindly rely on your indicated altitude to provide adequate terrain clearance just because you have the correct altimeter setting in the window. If you have a significant negative D-value, you may need to:

- Ask the controller for a higher altitude during vectors on arrival or departure.
- File for a higher altitude if your flight takes you over mountains en route.
- Fly IFR low level routes at a higher altitude than you normally would.

Epilogue

As a result of the C-130 incident, Major Beth, a Canadian exchange officer assigned to the USAF Instrument Flight Center, Randolph AFB, Texas, has developed an altimeter correction chart for low surface temperatures. (See figure 2.) In the near future, the chart will probably be published in the Flight Information Publication FLIP/GP. For additional information on altimetry or on the subject of weather in general, consult AFM 51-12, *Weather for Aircrews*. ■



THERE I WAS

■ Our feedback tells us you like our "There I Was" feature. You have some great stories out there just waiting to be told, so how about jotting them down. You can obtain the necessary form from your safety office. The forms are preaddressed to the Director of Aerospace Safety, so after your story is told, just fold, staple, and mail.

This is a totally anonymous program. It is not meant to encourage reporting of other peoples' shortcomings, not a grievance system, and there will be no retribution or confidentiality breaks. The inputs will receive the immediate personal attention of the Director of Aerospace Safety, and any items that may be useful to the operators and maintainers of our aircraft will be disseminated as soon as possible.

We'd like to cash in on the lessons learned from the close calls, near misses, errors of judgment, or whatever, which might generate a "There I Was" story.

This is an ongoing program, so FSOs, dig out your "There I Was" forms for local reproduction and dissemination. You can write to AFISC/SEPP, Norton AFB, California 92409-7001, for additional forms.

By the way, if you don't have a form, send your input on any kind of paper. We want the input, not necessarily the form. ■

THERE I WAS...

Fold

HQ AFISC/SE
NORTON AFB, CA 92409-7001

HQ AFISC/SE
"THERE I WAS"
NORTON AFB, CA 92409-7001

"EYES ONLY" for the DIRECTOR

Fold

REX RILEY'S Cross-Country Notes

REX RILEY
Directorate of Aerospace Safety

■ **Base A** — Numerous problem areas prevented recognition at Base A. Several items in flight planning were out of date, including the High Altitude En Route Charts. Maintenance documentation procedures were questionable, while in-flight meals were totally unacceptable. Some foods had been prepared 32 hours prior to preparation of the box lunches.

Base B — Most services proved to be satisfactory, with two exceptions. Crew transportation was basically nonexistent and was provided, when available, by transient alert. This nearly resulted in an unacceptable departure delay. In addition, some people displayed unacceptable attitudes and were reluctant to provide assistance where needed.

Base C — Billeting problems prevented recognition in this case. In spite of advanced reservations, our evaluator was issued an uncleaned room whose bathroom was in desperate need of mold removal. In addition, despite temperatures in the low 40s, the billeting staff failed to ensure that heating systems were activated and issued blankets to combat the cold.

Base D — Once again, billeting problems prevented recognition. In this case, the crew was split between on-base and contract quarters (in spite of reservations), and 2 of 11 crewmembers were issued rooms which were already occupied. In addition to lengthening the check-in process, our evaluator's crew interrupted the crew rest of another crew when they attempted entry into their room. The in-flight kitchen was unable to fill box lunch orders from their advertised menu, and the quality of frozen meals was questionable.

Hurlburt Field, Florida — Hurlburt field is new to Rex's list, and their staff deserves recognition for truly outstanding service. Their renovated base operations provides a comfortable, efficient location for all phases of flight planning, while Hurlburt's transient service people take great pride in providing first-class service. A great place to grab an excellent seafood dinner at any of several off-base restaurants, Hurlburt Field is one of Rex's favorites.

Dover AFB, Delaware — Dover's "one-stop" philosophy for aircrew service is to be complimented. The Dover Command Post takes that extra step and coordinates billeting needs before the crew's arrival. Contract quarters paperwork is processed at the command post, eliminating a crew stop at the end of a long day.

Crews billeted on base will find some of the best quarters in the Air Force are located at Dover. The rooms are very comfortable, well equipped, and conveniently located near a couple of small, but excellent, eateries. Rex salutes Dover AFB.

RAF Mildenhall, United Kingdom — Mildenhall is another facility where the people take pride in providing outstanding service. Base operations people are always ready to lend assistance in oceanic or European flight planning. The billeting staff has worked hard to upgrade on-base quarters while contract quarters remain comfortable and enjoyable.

One caution though — not all contract quarters can be located adjacent to the base (like the Smokehouse Inn), so crews should be patient if they have to endure a small drive to one of the other facilities. Everyone can't stay in the Smokehouse!

For those who have the time, London is a short train ride away and shouldn't be missed, schedule permitting. The passenger terminal has bus and train information available, and cabs are also available for the trip to town. Rex salutes all people at RAF Mildenhall and is proud to have Mildenhall on our award list.

Kadena AB, Japan — Kadena AB is another facility where outstanding service is a way of life. A super billeting staff go out of their way to meet every need of the transient aircrew, and base transportation does an excellent job in transporting crews to various on-base and off-base billeting locations.

Kadena is another location where base operations, passenger service, and maintenance people are challenged daily, and they consistently meet these challenges with success. A variety of centrally located contract quarters are conveniently located with shopping and eating facilities, increasing the pleasure of a Kadena stopover. Kudos to the staff at Kadena AB for a job well done. ■

FSO's CORNER

Heads-up MACA Pamphlet

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

■ In light of the increasing incidence of midair collisions and near midair collisions over the past few years, midair collision avoidance (MACA) programs are receiving ever-increasing levels of emphasis.

Most MACA programs consist of training and awareness activities aimed at "getting the word out" to military and civilian fliers and air traffic controllers. Typical programs also include crosstell and coordination efforts between military base personnel and surrounding area civilian airfield personnel.

Unfortunately, within the Air Force and civilian communities alike, increasing the level of emphasis placed on MACA programs, all too often, leads to pounding the same path another time with diminishing returns for additional effort. In short, development of new MACA "technologies" has not kept pace as more and more aviators take to the skies.

An original idea for "getting the word out" is as rare as hen's teeth, and when one comes along, it's worthy of note. The "Heads-Up MACA Pamphlet" from the 128th Tactical Fighter Wing (128 TFW) is one such idea.

The Heads-Up MACA Pamphlet consists of an 11- by 17-inch poster printed on lightweight card stock. The poster folds in the middle to form an 8.5- by 11-inch pamphlet that's easily mailed.

The upper half of the poster shows a photograph of an A-10 flight of two; identifies the location of the 128 TFW; and provides a point of contact (the safety office) for additional information, or to arrange for base tours or guest speakers for civilian aviation organizations.

Attached to the lower half of the poster are 25 identical, tear-off sheets that provide A-10 aircraft recognition and working area information.

The tear-off sheets are printed on both sides. In the top left corner on the front side is a photograph of an A-10 aircraft parked next to a Cessna 152. This enables the reader to compare the size of an A-10 with that of a common civil aviation aircraft. The top right corner shows airspeeds used in MOAs, on low-level routes, and in the pattern. The remainder of the page is devoted to depicting typical A-10 flight formations.

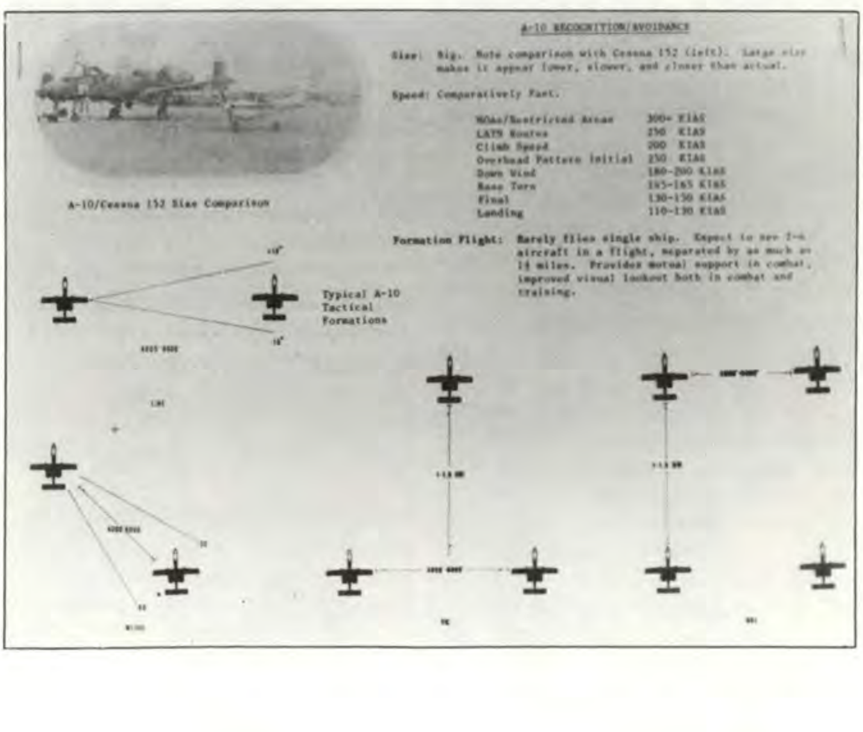
The reverse side of the tear-off sheets shows the most commonly used 128 TFW low-level routes on a map of Wisconsin, with altitude and airspeed information provided. In addition, a brief description of the flight training being accomplished and the rationale for that training is included.

A notable feature of the Heads-Up MACA Pamphlet is the absence of a "Don't fly in our sky" attitude. The portrayal is strictly informational, and most importantly, is made with an air of cooperation.

The safety folks at the 128 TFW distributed several hundred copies of their Heads-Up MACA Pamphlet to airports and aviation organizations throughout Wisconsin. Since distribution, they've received very favorable feedback with requests for additional materials.

Captain Gary L. Ebben provided this month's FSO's Corner idea. He's Chief of Safety at the 128 TFW (ANG), Truax Field, 3110 Mitchell Street, Madison, Wisconsin 53704-2591. Phone (608) 241-6204.

The FSO's Corner needs your ideas. What are you doing in your safety program that could help other FSOs if they knew about it? If you have a better idea to share with other FSOs, call me (Dale Pierce) at AUTOVON 579-7450 (SMOTEC) or send your name, AUTOVON number, and a brief description of your program idea to 919 SOG/SEF, Duke Field, Florida 32542-6005. ■



MAIL CALL

EDITOR
FLYING SAFETY MAGAZINE
AFISC/SEPP
NORTON AFB, CA 92409-7001

"The Hazards of Winter Flying"

■ In Captain Ben Rich's article, "The Hazards of Winter Flying," *Flying Safety*, October 1987, two statements are made which I feel are incorrect.

First he states that ice blockage of the aft pressure source results in inflated EPR readings for the Washington, D.C. 737 crash. The NTSB stated in their findings that ". . . the EPR gauges (indications) were erroneous because of the ice-blocked P^t_2 probes." P^t_2 probes are at the engine compressor inlet, and are not aft reading. A blocked P^t_2 probe will in fact give you a higher than actual EPR indication. Blockage of the *aft* probes would also give a false EPR indiction, but one that was *lower* than actual engine power, not higher.

Second, he states most authorities feel deicing fluid applied correctly provides 30 minutes of protection. The number usually heard in the airline industry, and used by us in the Navy C-9 community, is 20 minutes maximum, and then only for calm conditions when not taxiing in another airplane's prop/jet wash. I have enclosed additional pages which deal with this subject.

Last summer I wrote my first letter to *Flying Safety*, regarding what I felt was some bad information that had been presented. I write this letter in the same spirit: I have enjoyed *Flying Safety* since the start of my career as an Air Force Phantom driver. I *do* feel that mistakes not unnaturally occasionally occur, and the two letters I have written point out such errors. Please correct the information that has already been printed, as I can just imagine a pilot getting that wonderful sense of security *we all* are subject to when applying something we have read, and feel we are "covered" by this new knowledge. In this case, waiting 30 minutes between deicings may be disastrous!

Thank you for your attention. I would be happy to discuss any of these matters with you.

Very Truly Yours
Alan H. Gurevich
Lt, USNR-R

Thanks for your letter. You are correct in both cases. Captain Rich made an inadvertent error when he stated it was a blocked aft probe that caused the inflated EPR readings in the 737.

The subject of time between deicings is one that generates some controversy and a lot of misunderstandings. While 30 minutes, or more, is acceptable under certain conditions, it is definitely not a hard and fast rule. Your recommendation of 20 minutes under calm conditions is probably the best rule of thumb to follow.

However, aircrew judgment based on knowledge of their aircraft, weather conditions, and deicing fluid performance, is the key to keeping the aircraft clean. Under some conditions, it may be necessary to deice the aircraft at the end of the runway, just prior to takeoff. The basic rule to follow is, "Don't take off with any ice or snow on the aircraft." If in doubt, don't take off until you're sure.

Thanks for helping us keep the record straight. If this keeps up, we may have to make you a permanent consultant. ■

WHAT WOULD YOU DO?

Engine Fire?

■ The pilot of a fighter was setting up for a weapons delivery on the range. The aircraft was descending from 5,000 feet MSL to 1,900 feet MSL with both engines in maximum afterburner when the right fire light illuminated. The pilot terminated the pass and reduced the right throttle to military, then to idle. The fire light went out as the throttle was reduced.

What Would You Do?

a. Assume it was a false fire light and continue the mission.

b. Assume it was a false fire light, but leave the engine in idle, and terminate the mission.

c. Assume the light was due to an actual fire, perform the bold face items, test the circuit, and terminate the mission.

d. Don't assume anything. Leave the engine in idle, test the circuit, and look for other signs of fire.

What The Pilot Did

The pilot chose option b. His decision was based on having experienced two false fire lights in another type fighter. His assumption was reinforced by the light going out when he reduced power.

After the pilot had made two 360-degree climbing turns over the range, the utility and flight hydraulic lights illuminated due to heating of the hydraulic fluid. He made an immediate descent and landing at the auxiliary field. At 90 knots on the landing roll, the fire light came on again. He shut down the right engine and stopped on the runway.

There was extensive heat damage caused by an engine burn through. The fire light went out because the right aft fire warning sensor had been burned through. Had the pilot checked the circuit, he would have discovered the loss of continuity. He then would have been alerted to a possibly serious problem and shut down the engine. This would have considerably lessened the damage.

The best course of action would have been option c. Never assume a fire light is false. Too many people have gotten themselves in trouble by making such an assumption. Also, always test the circuit to find out if it is still functional. It just might have been destroyed by the fire or overheat. ■

Send your real-life submissions to:
What Would You Do?, *Flying Safety* magazine
AFISC/SEPP, Norton AFB, CA 92409-7001

OPS

Loss of Brakes

■ The F-16 pilot landed with a B system hydraulic failure. He used emergency brakes to stop and then set the parking brake as directed in the checklist. As the ground crew approached to pin the landing gear, the supervisor gave a "hold brakes" signal. The pilot put his feet on the brake pedals and the aircraft began to roll.

He dropped the hook, but it missed the barrier. He shut down the engine and the aircraft came to a full stop about 10 feet off the runway.

The pilot had depleted most of the accumulator pressure on the landing roll. There was still enough pressure to hold the parking brake. But, the toe brakes take priority over the parking brake. Therefore, when the pilot tried to hold the brakes, the last of the accumulator pressure was dumped overboard.

So, if you land the F-16 with brake failure, don't use the toe brakes after setting the parking brake.

No More Static

Two F-4s took off in formation for a BFM mission. The IP in the rear seat of the No. 2 aircraft noticed the student came out of afterburner at 260 knots instead of the normal 300 knots. He assumed it was a student error. (Yes, students have sometimes been known to err.)

No. 1 passed the lead to No. 2 and dropped back to conduct a weapon system check. Shortly after, the new wingman asked lead to slow down so he could rejoin.

The IP then realized his airspeed indication was wrong. When the wingman joined up, they compared airspeed and determined the lead aircraft had a pitot static problem. He declared an emergency and was led back for an uneventful landing.

After landing, they discovered the static ports were covered with tape. (Yes, it's happened many times before.)

The ports had been taped over when the aircraft was painted. The corrosion control people forgot to repaint the red circle around the static ports and they forgot to remove the tape.

No one in maintenance discovered the tape on the ports, and the crew missed it on preflight. Maybe some people need to read their checklists.

Alert Instructor

A B-52 was cleared for a predawn takeoff. As the aircraft commander (AC) advanced the throttles for takeoff, the instructor pilot (IP) looked down the runway. He noticed two lights on the right side of the runway that didn't fit the normal pattern for runway lights. He quickly realized there was a vehicle on the runway and advised the AC to abort.

The vehicle was a slow-moving sweeper that had been on the runway for about 30 minutes. The ground controller had followed normal procedures and placed a card over the wind indicator when the sweeper was cleared on the runway. However, the card fell off at some later time while the vehicle was still on the runway.

The tower controller had forgotten about the sweeper. Since the wind indicator was not blocked, he cleared the aircraft for takeoff.

This is a good example of a crew working together to catch the unexpected in a routine situation. Good heads-up flying!

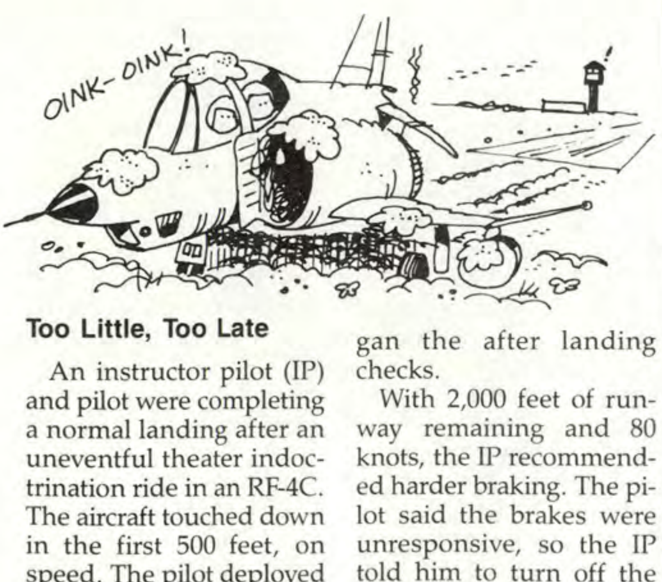
TOPICS

Biting the Hand

The C-130 was making an engine running offload of an extra crew. While running the afterlanding checklist, the flight engineer became distracted when the air turbine motor would not come on the line. As a result, he didn't fully depressurize the aircraft.

The checklist was called complete, and the loadmaster opened the crew entrance door while holding the door lanyard in his right hand. The air pressure inside the aircraft forced the door to open too quickly. This yanked the lanyard out of his hand and broke two of his fingers.

Be careful of those little distractions that are constantly vying for your attention. You never know when one of them is going to jump up and bite you, or another member of your crew.



Too Little, Too Late

An instructor pilot (IP) and pilot were completing a normal landing after an uneventful theater indoctrination ride in an RF-4C. The aircraft touched down in the first 500 feet, on speed. The pilot deployed the drag chute, checked the brakes, and the IP began the after landing checks.

With 2,000 feet of runway remaining and 80 knots, the IP recommended harder braking. The pilot said the brakes were unresponsive, so the IP told him to turn off the antiskid and drop the tail hook.

By the time the hook came down, they had passed the last barrier. The IP pulled the emergency brake handle as the aircraft entered the overrun. The aircraft came to a stop 12 feet off the end of the overrun.

There was nothing wrong with the aircraft. The problem was that the pilot was used to landing on runways 12,000 feet long, not 7,875 feet long. Also, they had to land early because of quiet hour and the aircraft was heavy. The pilot simply didn't slow the aircraft soon enough, and the IP didn't do anything until it was too late.

Don't let an uneventful mission lull you into being complacent. "Normal" isn't always normal. Also, make sure you perform checklists at the appropriate time. ■

More Power, Scotty

A C-130 encountered moderate turbulence on a low level route. The navigator recommended a climb and the pilot added power and raised the nose. Shortly afterward, the aircraft entered IMC and the pilot rapidly increased power to maximum.

The engineer had been tightening his seatbelt due to the turbulence, and he looked up to check the engine torques as he felt the rapid power increase. He saw the torque passing 21,000-inch pounds and yelled "torque" 3 times.

The aircraft commander, who was standing behind the pilot evaluating the terrain system and clearing, also called out "torque." The copilot, who had been clearing outside the aircraft, quickly retarded the throttles to within limits.

The torque had exceeded 23,000-inch pounds. The time from the start of the climb to the torque calls was 2 to 3 seconds. The crew aborted the low level and returned to base.

Another example of how a momentary lapse in crew coordination can quickly turn a routine mission sour. ■

MAINTENANCE MATTERS

LET THERE BE LIGHT

■ Two egress technicians were dispatched during darkness to an F-4 to remove the aft survival kit and seat bucket. After using a flashlight to ensure all safety pins were in place, the first technician assisted his buddy in extracting the bucket out of the aircraft. As they lifted the bucket up, the two technicians heard a loud bang. The M3-A2 cockpit-mounted initiator had fired.

Investigation revealed the cockpit-mounted initiator's safety pin was improperly installed after the last flight of the evening, less than 1 hour prior to this mishap.

Obviously more than one person had a hand in this explosives mishap. The crew chief was probably cold on the late night recovery of the jet, and due to darkness, improperly installed the safety pin to the cockpit-mounted initiator.

Even though they used a flashlight, the two egress technicians "saw what they wanted to see" when checking that the cockpit safety pins were properly installed.

There's an obvious lesson here for all of us who perform tasks during hours of darkness. Be careful! Although the two egress technicians were not injured during the bucket removal, far greater consequences have resulted from similar maintenance mishaps.

Compliance with proper tech data and careful inspections with a flashlight can enlighten all of us during future nighttime operations.

THE ONLY STANDARD

How often do you complete a job, and even when it isn't up to your usual standards, you consider it "good enough?" Seldom does a mishap investigation reveal a new and unknown hazard. Often someone was rushed, or it was the last job before shift change, or the "good enough" standard was used.

While flying a surface attack mission, an A-10 pilot noticed a right engine oil pressure warning light and a low pressure reading on the right engine oil gauge. He shut down the affected engine and landed at home base uneventfully.

A postflight inspection revealed a cracked oil pressure tube on the right engine. Prior to the mishap flight, a maintenance technician had installed the tube backwards, causing it to bend around another part which put a small kink in the tube. This created a stress concentration, causing the oil pressure tube to crack during flight. Tech data properly illustrate how to install the tube correctly.

This points out how quickly the "good enough" standard can produce a mishap. Whenever you perform maintenance, no detail should be too small or too common to go unchecked. The only standard is tech data. And it is this standard that often means the difference between preventing a mishap or causing one.

PASS THE WORD

While their home base was undergoing a runway barrier modification, one of our fighter units was deployed to another base to fly sorties. One such sortie was shorter than expected.

After reducing the throttles to idle momentarily to stabilize behind lead for a boresight check, the pilot noticed the right engine had flamed out. He restarted the engine and recovered at the nearest base.

Investigation revealed this was the first sortie following a No. 2 engine throttle box change. Since there was no holddown facility for this type of fighter at the deployed site, the maintenance folks were unable to accomplish full-power runup checks. So they made an entry into the aircraft forms requesting a pilot to perform a power check at 100 percent, which he did.

But the tech order requires an "accel/decel" check be performed after any throttle box change. The engine technicians failed to document this specific requirement in the forms. If they had, the proper check would have probably revealed the misrigging and consequently, prevented the flameout.

Something like this just proves that everyone must understand the importance of correct forms documentation. Take the time to "pass the word" by ensuring required procedures and checks are properly documented for all to read. If we all do our part, we can hopefully prevent mishaps such as this.

MAINTENANCE MATTERS

FOREIGN OBJECT DAMAGE

After reading these cases of FOD, you will see that anything, anywhere, at any time, can be the culprit. Usually, however, someone could have prevented the damage.

F-15. Foreign object damage was discovered in the left engine following a trim pad run. Prior to the run, the crew chief removed a panel from forward of the intake area. Instead of immediately using a screw bag, he placed the screws on top of the left inlet ramp. Only after all of the screws were removed did he obtain a bag, place the screws in it, and attach it to the panel.

Sometime later, another individual was tasked to install the same panel. When he found three screws missing, he obtained new ones from bench stock and installed the panel.

During the panel removal, one or more screws probably dropped off the inlet ramp onto the inclined surface between the intake and fuselage. Then, during the engine run, a screw vibrated off the surface and was ingested by the left engine.

T-38. An engine technician was performing an engine run at military power at the sound suppressor. The right side protective screens were in a position that left a ½-inch opening between the top screen pad and the fuselage.

As the second technician entered the rear cockpit from the right side with the engine at mil, his ground communication cord snagged on something and came unplugged from his head set. The cord fell through the opening and was ingested into the engine.

F-4. A weapons specialist approached an aircraft in the arming area from the right side to remove the ALE-40 safing pin and the captive AIM-9 missile nose cover.

While walking just aft and under the intake, he placed the pin in the missile cover but the streamer hung out. The streamer and pin were sucked down the intake.

F-16. During engine shutdown following flight, the crew chief heard abnormal noises during the last few seconds of engine rotation. He then remembered the aluminum integrated control panel (ICP) cover he had reported missing shortly after the aircraft launched.

Maintenance had previously searched the launch area and operations notified the airborne pilot to conduct a cockpit FO check. The results were negative.

The ICP cover had been ingested at engine start and was held against the inlet guide vanes (IGV) throughout the entire flight by engine suction. It wasn't until engine shutdown that the ICP cover fell to the bottom of the IGVs and entered the spooling down engine.

F-5. Following a periodic maintenance inspection, the dock team installed engine bay panels in both engine bays. But two screws on a top aft side were not tightened sufficiently to engage their locking mechanism.

Later, the aircraft was towed to the sound suppressor and positioned for an engine run. Shortly after both engines were started, the left engine began to rumble and vibrate.

After engine shutdown, the aircraft was towed to a hangar where the left engine was removed. During their inspection, investigators found one screw missing and an adjacent screw loose in the bay area.

IS YOUR TRAINING DANGEROUS?

A newly assigned airman was attending his unit's field training detachment (FTD) crew chief course at Fighter AFB. It was now time to perform the task of servicing the tail hook damper.

While standing next to the jet, the FTD instructor sent his student to the cockpit to put the tail hook switch in the "down" position. The eager student inadvertently pulled the canopy jettison handle. The instructor realized what had happened when he saw black smoke coming from the external canopy jettison handle access door.

Fortunately, the canopy didn't jettison from the aircraft. However, damage did occur to the aircraft in both the internal and external canopy jettison initiators and the explosive lines between the initiators and the canopy remover.

What is the lesson learned? The person responsible for training should be sure any potential hazards are identified and eliminated before the training begins.

In this mishap, the trainee wasn't quite sure of the cockpit handles and levers. Granted, he didn't stop and ask for help, but then again, he probably didn't want to appear unknowledgeable in front of his peers or the instructor.

If a training program is not developed to anticipate questions that may or may not be asked, we can guarantee a mishap will occur.

Is your training dangerous? ■

UNITED 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.

SECOND LIEUTENANT

Stephen D. Jones

64th Flying Training Wing
Reese AFB, Texas

■ On 3 February 1987, Lieutenant Jones was flying a T-38A on a solo out-and-back mission at FL 210 when the front cockpit canopy shattered. The sudden and explosive depressurization forced his mask down and his visor up, and the debris caused abrasion to his right eye.

While initiating an emergency descent and deceleration, he placed his visor back down, his mask back on, and dialed emergency on his transponder. Noise inside the cockpit was so severe that Lieutenant Jones could not hear any radio transmissions from the ground.

He selected guard on his UHF radio, transmitted his emergency situation and his intent to divert to Cannon AFB, New Mexico, which was in sight. Cannon approach control vectored nearby aircraft out of the vicinity while Lieutenant Jones maneuvered to a straight-in approach for the runway he had observed in use. He then completed an uneventful approach and landing.

The entire front canopy glass was gone. The pilot's helmet and mask were damaged from the debris, and a 2-inch long piece of glass was found imbedded in the left side of his headrest. The aircraft sustained numerous dents on the wings and stabilator from the impact of the canopy debris. There was also evidence that glass had entered the right engine intake.

Although still a student pilot, Lieutenant Jones' professional response to this highly unusual emergency, for which there are no procedures, minimized further damage and prevented loss of a valuable aircraft. WELL DONE! ■

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UNITED STATES AIR FORCE

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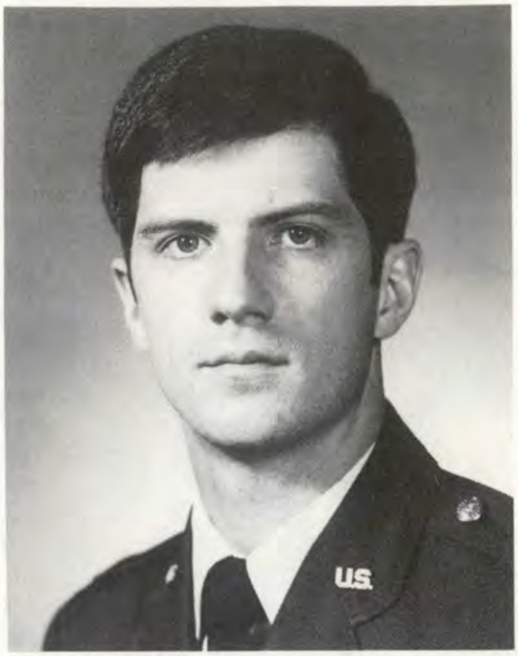

CAPTAIN

Jeffery O. Jensen

19th Tactical Air Support Squadron

■ On 22 December 1986, Captain Jensen was flying an OV-10A on a functional check flight. When he started the maximum speed dive and pullout check, the aircraft accelerated smoothly up to 310 knots, then suddenly began to buffet violently. He immediately retarded the power levers to flight idle and attempted to recover from the dive, but the aircraft would not respond to control inputs and began to tuck under. Capt. Jensen checked his instruments for indications of the malfunction, but was unable to read them because of the severe vibration. He then saw the left wing was visibly bouncing, and the propeller spinner was vibrating excessively.

Since he was well above the 2,500 feet AGL out-of-control ejection altitude, Captain Jensen elected to attempt one more recovery. He used both hands to pull and hold the control stick full aft and waited for the aircraft to respond. Abruptly, the nose began to track up to the horizon. Fighting against the buffet to maintain control, he recovered the aircraft to wings level flight at approximately 3,000 feet AGL.

Captain Jensen suspected the loss of a propeller blade tip and feathered the No. 1 engine. As airspeed decreased through 180 knots, the propeller feathered and buffeting began to dissipate. Although the feathered propeller appeared undamaged, he decided to leave the engine feathered and recover single engine. He declared an emergency, performed a controllability check, and expertly recovered the aircraft by an uneventful single engine straight-in approach.

Investigation revealed that an aileron spring tab control arm had become disconnected. This allowed the tab to flutter at high speed and forced an aerodynamic reaction in the left aileron. The amplitude of both spring tab and aileron flutter quickly increased, producing the violent buffet and some internal wing damage.

Captain Jensen demonstrated exceptional judgment, flying skills, and situational awareness. His actions prevented the loss of a valuable aircraft. WELL DONE! ■

The Ambulance Down In The Valley

'Twas a dangerous cliff, as they freely confessed,
Though to walk near its crest was so pleasant;
But over its terrible edge there had slipped
A duke and full many a peasant.
The people said something would have to be done,
But their projects did not at all tally.
Some said, "Put a fence 'round the edge of the cliff,"
Some, "An ambulance down in the valley."

The lament of the crowd was profound and loud
As their hearts overflowed with pity;
But the cry of the ambulance carried the day
As it spread through the neighboring city.
A collection was made, to accumulate aid,
And the dwellers in highway and alley
Gave dollars and cents — not to furnish a fence —
But an ambulance down in the valley.

"For the cliff is all right if you're careful," they said;
"And if folks ever slip and are dropping,
It isn't the slipping that hurts them so much
As the shock down below — when they're stopping."
So for years (we have heard), as these mishaps occurred
Quick forth would the rescuers sally,
To pick up the victims who fell from the cliff,
With the ambulance down in the valley.

Said one, in his plea, "It's a marvel to me
That you'd give so much greater attention
To repairing results than to curing the cause;
You had much better aim at prevention.
For the mischief, of course, should be stopped at
its source;
Come, neighbors and friends, let us rally.
It is far better sense to rely on a fence
Than an ambulance down in the valley.

"He is wrong in his head," the majority said,
"He would end all our earnest endeavor.
He's a man who would shirk this responsible work,
But we will support it forever.
Aren't we picking up all, just as fast as they fall,
And giving them care liberally?
A superfluous fence is of no consequence,
If the ambulance works in the valley."

The story looks queer as we've written it here,
But things oft occur that are stranger.
More humane, we assert, than to succor the hurt
Is the plan of removing the danger.
The best possible course is to safeguard the source
By attending to things rationally.
Yes, build up the fence, and let us dispense
With the ambulance down in the valley.

Author Unknown