TAC ATTACK

DECEMBER 1981

SEASONS GREETINGS
FROM US TO YOU

HARRISON

DEC

READINESS IS OUR PROFESSION

GEN W. L. CREECH
COMMANDER

LT GEN THOMAS H. McMULLEN
VICE COMMANDER

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COL RICHARD K. ELY
CHIEF OF SAFETY

MAJ JIM MACKIN
EDITOR

STAN HARDISON
ART EDITOR

MARTY DILLER
EDITORIAL ASSISTANT

SGT DAVID GARCIA
STAFF ARTIST

TACRP 127-1

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Angle of Attack

It's December, and we don't intend to put a damper on your holiday spirit. But we'd like to help make sure you enjoy it.

Before we begin our Christmas decorating, we ought to take a look at "Holiday Hints." A few minutes of care can save us a lot of heartache.

Flying crewmembers can gain by reading "Survival in Winter's Wonderland." An emergency in the cold country doesn't have to ruin our holiday if we're prepared for it. As a matter of fact, all of us who hunt, snowmobile, or do any other outdoor activity in the cold weather can profit from the article.

Pilots face a year-round problem with ricochets on the weapons-delivery ranges. "Ricochet Risks" suggests what we can do to reduce the problem.

As usual, our regular features include lots of lessons learned. I hope we can turn them to our advantage. Let's do everything in our power to ensure that each one of us is hale and hearty when the new year arrives.

Speaking for everyone in TAC Safety, we wish you a happy and healthy holiday season.

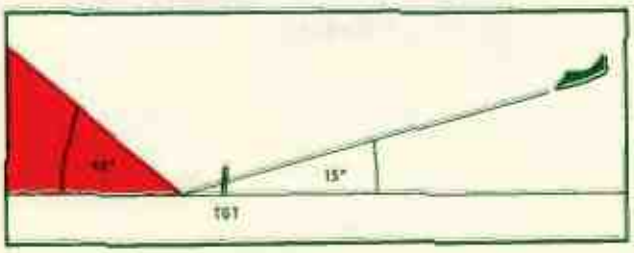
Richard K. Ely

RICHARD K. ELY, Colonel, USAF
Chief of Safety

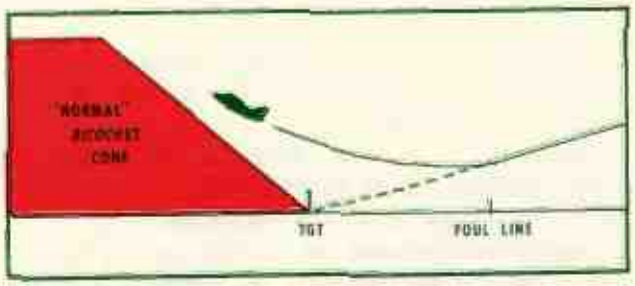
Ricochets on the gunnery range have been a threat since we first began strafing, and the threat hasn't gone away lately. As long as we're going to go to the range and shoot bullets, we'll be taking a chance on a ricochet. A 1973 study at Eglin claimed that we could eliminate the ricochet hazard only if the aircraft was limited to a speed of 100 knots or less and did a 4-G pullout at a slant range of 2,000 feet. Most of us would have trouble hacking those parameters.

That same study, however, showed that we can reduce the risk of ricochets striking our aircraft. And that's where we can make some headway—by keeping our risks to a minimum. We do that in two ways: good delivery techniques and good range housekeeping.

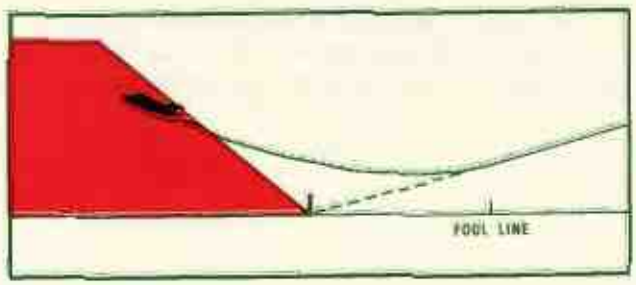
When we strafe, most of the rounds we fire ricochet downrange. That's because the bullet tends to exit the ground at a low angle when it entered at a low angle. Strafing at 5 to 15 degrees causes the "normal" ricochet pattern to have 40 degrees or less exit angle.



It's apparent that we can avoid the normal ricochet pattern by staying above that 40-degree cone. So, how do we do that? We fly the pattern correctly and pull off correctly, that's how. (That's also a good way to avoid fouls, coincidentally.) If we fire at the correct dive angle, airspeed, and slant range, we can avoid that 40-degree cone by pulling off with 4 Gs in 2 seconds.

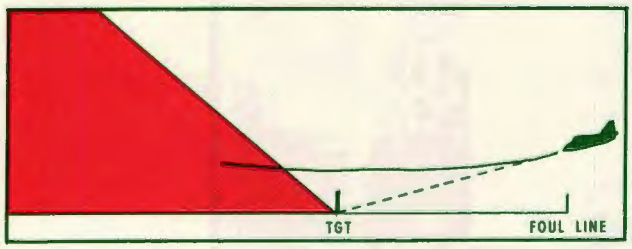


But what happens when we fire past the foul line or, more commonly, delay our pullout to watch the bullets hit?



Our pullout is a turn in the vertical. Like any turn, the radius increases with airspeed; so if we're way too fast, we'll fly into the ricochet cone. Conversely, an aircraft that strafes at a slower speed but still pulls out at 4 Gs stays further away from the ricochet pattern. That's why the 100-knot airplane is considered invulnerable to ricochets: it doesn't have to overfly the target.

A lazy pullout also increases the radius of turn. Like high airspeed, the result is a flatter pullout and penetration of the normal ricochet zone.

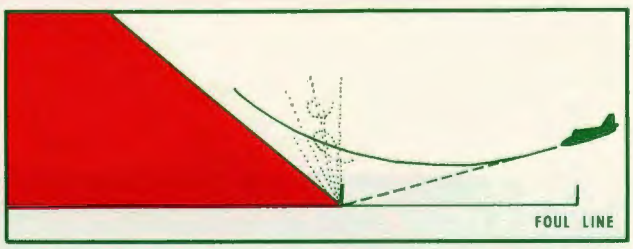


We can see that our delivery parameters and pullout are the keys to avoiding the *normal* ricochet zone. But, in fact, much of our ricochet damage comes from *abnormal* ricochets. An abnormal ricochet is caused by debris on the range; usually it's the debris that actually causes the damage.

Even the flying debris normally ends up in the 40-degree cone, but occasionally it pops almost straight up—it's a kind of tiddly-winks effect. Aircraft have

RICOCHET RISKS

even been known to be hit from above by descending debris.



What is the debris? Mostly it's rounds fired by the jocks who used the range ahead of us. Most of the bullets go downrange, but some stay in the strafe pit. There's also an occasional rock or two in the pit. When the debris is struck by a bullet, the debris can pop up, or it can deflect the bullet in a strange direction.

Although correct parameters and a good pullout can reduce the risk from debris, the real answer lies in policing the strafe pits. That's up to the range crew, the range crew chief, and the range officer. The range regulations now have a renewed requirement for disking or chisel plowing and magnetic sweeping of the strafe pits every week or every 6 use-days. Each and every day, the range crew should police by hand the strafe pit from 75 feet in front of the target to 100 feet behind it. The range crew chief and the range officer should inspect the area before the first mission of the day to make sure all spent rounds and any rocks as big as a man's fist are removed.

That still won't guarantee we won't get ricochets. After all, the last flight in the afternoon will be shooting into a strafe pit that's seen a lot of business. But good policing will sure reduce the risk.

Both in the air and on the ground, it's the line jock who can do the most about ricochets. In the air, flying the gunnery pattern right will avoid the bulk of the ricochets. On the ground, when it's our turn in the barrel as range officer, we can do the job right by really inspecting the strafe pits daily. And we can call the fouls. We aren't doing our buddy any good by letting him develop habits that may cause him to eat a ricochet someday.

Strafe Pit Debris—A 30mm and two 20mm rounds policed out of a strafe pit. They've all been hit by another round. Notice that the 30mm round has a 20mm-sized groove in it.

Aircrew of Distinction

On 28 May 1981, Lt Col William M. Douglass and Maj James F. Boggan were on an F-4 air-to-air sortie against F-15s. During the rejoin after takeoff, the fire warning light for the right engine came on. The fire light wouldn't go out with the throttle in idle, so Colonel Douglass shut down the right engine. Major Boggan confirmed all checklist procedures complete. They dumped the fuel and planned for a single-engine landing. Shortly after they began final approach, the F-4's utility hydraulic pressure dropped to zero; the aircraft became extremely difficult to control. Landing gear indicators went from down and locked to unsafe. They couldn't maintain altitude and airspeed, so Colonel Douglass selected full afterburner for go-around. They achieved level flight at 500 feet and stopped the airspeed from bleeding off at 195 knots. About a minute later, utility hydraulic pressure returned; but the flaps couldn't be raised safely. Colonel Douglass decided not to further burden the utility system and maintained landing configuration. Airspeed increased to 210 knots.

In order to position the aircraft for landing, the aircrew had to fly an indirect route around a small mountain range without using more than a 15-degree bank. Ten miles out on final, the utility pressure again dropped to zero, and the flaps individually went to trail position. The aircraft entered a pitching and rolling maneuver, which Colonel Douglass quickly controlled. The aircrew continued a steep, low-power, straight-in approach at 230-250 knots, landed, and safely stopped the aircraft prior to the departure-end arresting cable. Colonel Douglass and Major Boggan's prompt, decisive reactions, superb flight analysis, and superior airmanship not only prevented loss of the aircraft and injury to themselves, but averted possible loss of life and damage to property below the aircraft's flight path. Their actions qualify them as the TAC Aircrew of Distinction.

Lt Col William M. Douglass
311 TFTS, 58 TTW
Luke AFB, AZ

Maj James F. Boggan
58 TTS, 58 TTW
Luke AFB, AZ

TAC TIPS

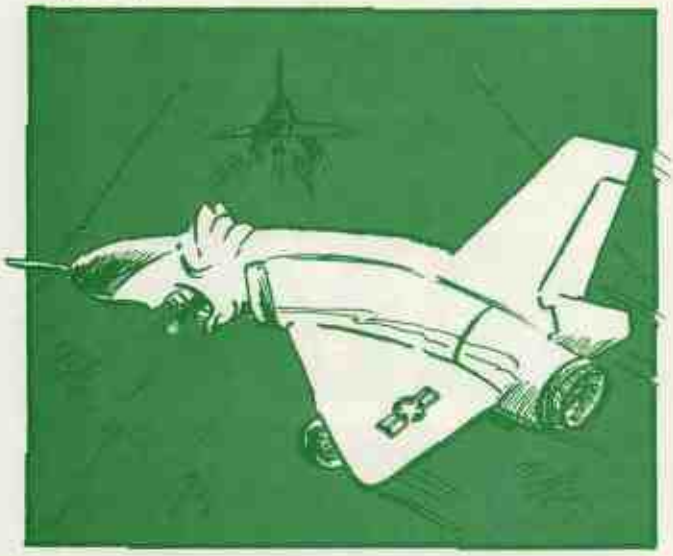
...interest items, mishaps with morals, for the TAC aircrewman

Brilliant minds often make foolish decisions.
—Henry M. Morris

SURPRISE RCR

Here's a lesson on winter runway condition readings (RCRs) we learned last year—the hard way:

The flight of six F-106s was deploying to a northern base. If the weather permitted, they planned to land from an overhead pattern. When they arrived, the weather given by tower was good—5,000-foot broken, 10 miles visibility, winds calm, RCR 16. So they split into two 3-ship elements, flew down initial, and pitched out, using 4-second spacing. Numbers 1, 2, and 3 touched down normally. Then number 2's drag chute failed and departed the aircraft; tower radioed to him what had happened. He used aero braking; but without the drag chute, he was closing too fast on number 1.



Well, their briefing for the mission had been thorough and had covered this kind of contingency. They had briefed that a pilot with problems would move to the outside half of the runway (the "hot" side), the other pilots would move to the inside (the "cold" side) to allow the other plane to pass safely. So that's what they did, exactly as they had briefed. Number 2 moved slightly left of centerline to the outside; number 1 moved to the right. With 5,000 feet of runway remaining, number 2 neatly passed number 1. Number 2 rolled out and got stopped without any problem. But, in the meantime, number 1 was getting the ride of his life.

It began after number 2 passed him. Number 1 then tried to correct back to the centerline of the runway. When he began a left turn back, he completely lost control of the airplane. It skidded across the cleared center of the runway into the snow- and ice-covered left side of the runway. Then it left the runway at about a 30-degree angle and headed off onto the frozen ground. The airplane finally stopped when it hit the 1,000-foot-remaining runway marker with its left wing. The airplane wasn't moving too fast by then, so the damage was limited to a hole in the center leading edge panel of the left wing. The pilot was uninjured, but wide-eyed.

An investigator checked the runway shortly after the incident. He noticed that about 40 feet of the center of the runway was clear, but both sides of the runway were snow packed and ice covered. The investigator checked the RCR on the centerline; sure enough, it was 16. But the RCR just 20 feet to the right of centerline, where number 1 was when he tried to correct back, was 6. That significant difference between the RCR on the centerline and the outer portions of the runway hadn't been reported to tower, so it wasn't passed on to the pilots.

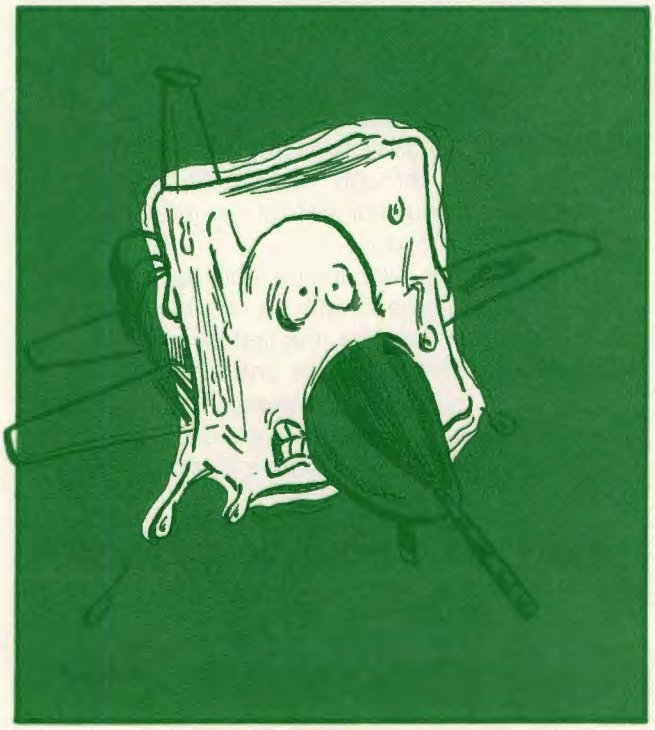
Surprises are nice when they're Christmas presents. But this kind of a surprise we can do without.

JUDGMENT FREEZE

Here's another lesson from last winter, this time from another command. A T-38 aircrew went out to their airplane and found the oxygen regulators frozen. The temperature the night before had dropped to 6 degrees F, with a windchill factor down to −35. Undismayed, the aircrew started engines and taxied out, setting the temperature to full hot and directing the outlet at the oxygen regulators. By takeoff time, the regulators *appeared* to be normal; they pressed on.

A short time later, while climbing through 27,000 feet, the aircrew noticed that they were losing cabin pressurization. They also noticed the onset of hypoxia symptoms. The aircrew moved the diluter levers to 100-percent oxygen and put the flow levers in Emergency. The regulator supplied pressure only when the levers were held in the Emergency position. When they let go, the pressure would quit. But the aircrew was able to descend and land without any major problems.

Maintenance found that, in addition to frozen oxygen regulators, the aircraft had a frozen canopy seal regulator and frozen canopy boots. And apparently an aircrew with frozen brains who took an airplane with a known oxygen problem and didn't even ask for maintenance assistance with the problem.



COMPLACENCY

This lesson learned was sent to alert all of us:

One of our pilots was cleared to fly an instrument approach to runway 17 and to circle for a right downwind for runway 12. While at circling minima on downwind for runway 12, tower requested the pilot to turn left for a "270-degree turn to base" for spacing on an aircraft landing runway 17.

In a congested airport traffic area, this is frequently requested for VFR traffic spacing; and it's something that pilots frequently accomplish. In this particular incident, the pilot forgot to consider his altitude and also forgot to consider the circling obstruction criteria (2.3 nautical miles from the end of the runway for category D aircraft). When the pilot turned away from the runway environment, the aircraft departed the circling obstruction-clearance area. A bright light sitting on top of a 1,888-foot tower then came into his view—32 feet below the aircraft. A climbing turn was begun to increase clearance from the tower.

Complacency happens to everyone. In this case, both the pilot and tower controller failed to consider the aircraft's altitude and location when they planned a routine "270 to base for spacing." Our local procedures have been reviewed; how are yours?

TAC TIPS

CAUSE FOR CELEBRATION

We've seen a couple of horror stories lately about aircrew ejections. Fortunately, the horror stories had happy endings; though we expect that the crewmembers involved still wonder how they survived.

In the first story we saw, an F-16 overseas struck a bird. It was a big bird, a 12-pound crane, which struck the canopy transparency at eye level just left of center. Due to the violence of the birdstrike, the pilot was not conscious of what was happening; he ejected instinctively.

The ejection seemed to him very pleasant, with little change in the airblast since the canopy had been broken by the bird. The ejection seat felt like it worked normally. But when the pilot began to collect his senses, he wiped the blood from his eyes and found that he was hanging upside down in his parachute harness, held in only by the leg straps. He managed to pull himself back up into the harness and fasten the chest strap. Part of the hardware on the V-ring of the chest strap had been broken when it was struck by a hard object during the birdstrike sequence. After repositioning himself in the harness, the pilot did a 4-line cut to control his oscillations and then landed safely on hard ground.

On the other side of the world, two pilots were flying a T-33 that exploded in flight. Vented fuel had leaked into the cavity between the tailpipe and the fuselage where it ignited. The aircraft rolled violently to the left; both crewmembers banged their heads on the canopy. The backseat pilot doesn't remember anything from then until a local ambulance picked him up.

The explosion and aircraft disintegration broke the engine loose and it drove forward, striking the rear cockpit bulkhead with enough force to break the rear ejection seat away from the catapult and seat rails. The rear seat moved far enough forward to fire the floor-mounted M32A1 initiator, which is designed to fire after 8-10 inches of upward travel by the seat. When the initiator fired, it released the backseater's lap belt and activated the seat-man separator, which threw him out of the cockpit. The zero-delay function deployed his parachute automatically. The main canopy was pulled through the aircraft fire, burning several panels, but not enough to prevent a safe landing in a rice paddy.

Meanwhile, the pilot in the front seat was also stunned. As he came to, with his chin tucked against his chest by the G-forces, the first thing he saw was his lap belt, with both hands only inches away. He grabbed the lap belt and released himself. He fell free of the aircraft, located and pulled his ripcord, did the 4-line jettison, and made a normal parachute landing fall.

In years to come, these stories will disappear into the category of aircrew members who parachuted to safety. But to the three crewmembers involved, there'll always be more to the story. Call it luck or Providence, they have cause to celebrate this holiday season.

T-SHIRT GIVE AWAY

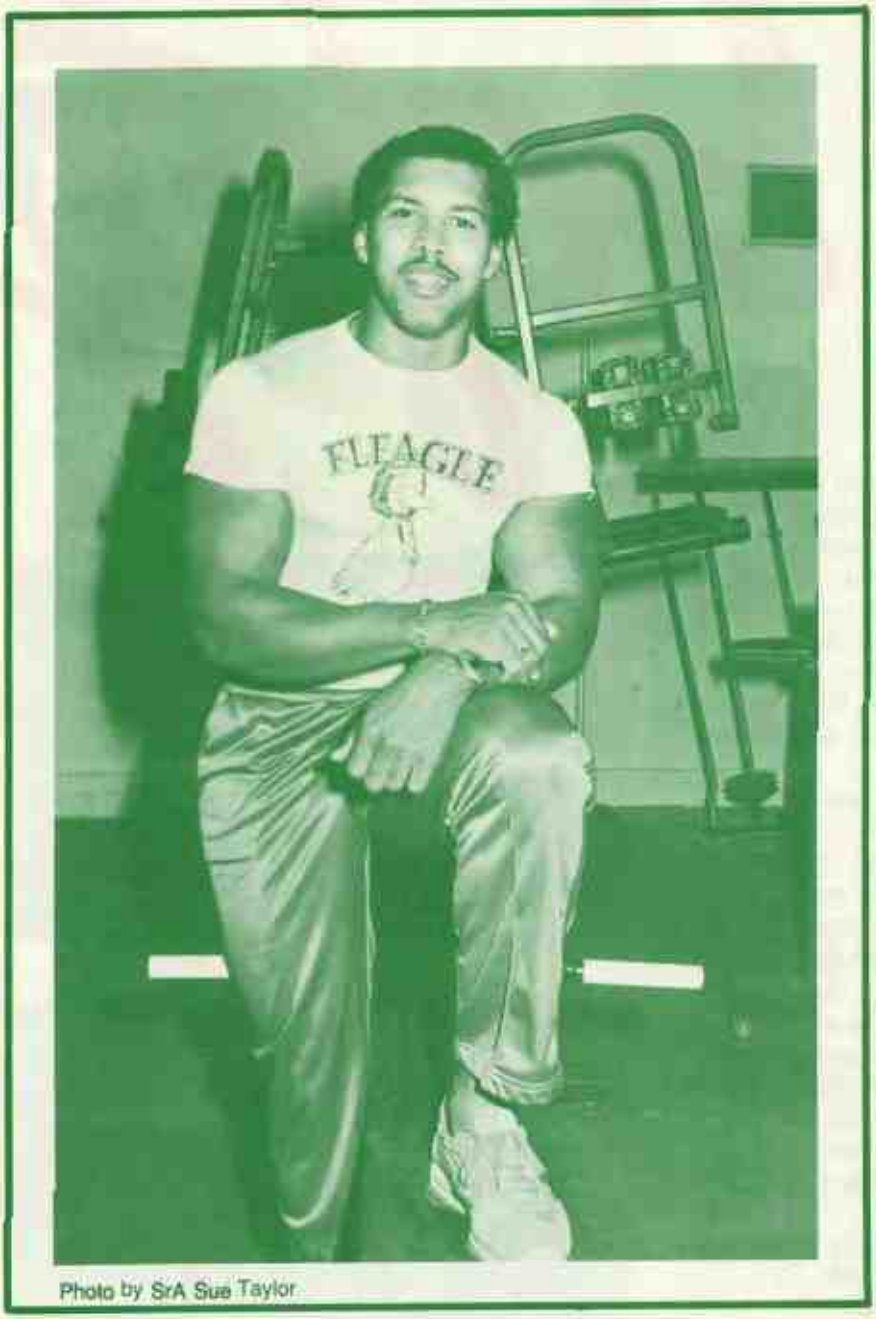


Photo by SrA Sue Taylor

My friends at TAC ATTACK are waiting to hear from you

Hello.

My name is Alex Kinion. If I could have your attention for a moment, I would like to tell you how you can own a Fleagle T-shirt just like the one I'm wearing. As a matter of fact, it won't cost you a penny. Here's all you do:

Write an original article, poem, or story for *TAC ATTACK* magazine on any aspect of safety—aviation, maintenance, operations, life support training, survival, weapons delivery, or maybe your very own, completely unique war story. If it's published in *TAC ATTACK* and selected as the best story of the month, you're an instant winner; and you'll join the exclusive club of T-shirt winners. Your story should illustrate some lessons learned or otherwise contribute to the overall safety theme of the magazine.

So, don't wait until tomorrow, because your friends and acquaintances are already working on their stories.

Send your story to:

Editor, TAC ATTACK
HQ TAC/SEPP
Langley AFB, VA 23665

For more information, call AUTOVON 432-3658/3373.

• • •

Sgt Alex Kinion, last year's "Mr. Virginia," is the Tactical Air Command's consultant for physical fitness. In addition to being Mr. Virginia, Alex won the "Mr. Atlantic Coast" competition and was first runner-up in the "Mr. Northeast America" contest. He is a computer operator in the 4501st Computer Services Squadron, Langley Air Force Base, Virginia.

Writing an article may win you a T-shirt; but to fill it out like Alex, you'll have to get with the physical fitness program.

Safety OVER

In August, we announced the award of the TAC Individual Safety Award to CMSgt Lloyd C. Martindale of the 124th Tactical Reconnaissance Group, Idaho Air National Guard. The award nomination contained some information that stirred our curiosity: Chief Martindale had been involved in munitions safety since 1949. That's quite a history. We wanted to know more about him; so we called his boss, Maj Stan Anderson, who obliged us by sending the information for this story.

Chief Martindale began working with munitions well before he joined the Guard in 1949. From November 1942 to November 1945, he was an armament man in the Navy, handling mines, torpedoes, machine-gun ammo, and 500-pound bombs. In those days, Chief Martindale had bright red hair which gained him the nickname "Red Dog."

Red Dog Martindale attended armanent school at the Naval Air Technical Training Center in Norman, Oklahoma, in early 1943. He spent World War II serving in Navy commando units in the South Pacific. The Chief recalls, "Guadalcanal was the first island I ever saw. Henderson Field Fighter Strip One—that's where we were."

During his tour in the Navy, Red Dog worked on armament for the T-6, F-4, F-6, F-4U, TBM, PBY, and others. He spent much of his time loading bombs at the bomb dump, where the ships would leave the ordnance. The Chief said he'd "swing 500-pound bombs three at a time with a cherry-picker, day and night. One feller came up with a dump-truck load of bombs and just dumped the load and went on. He dumped the load and everyone ran; I just sat there. It was too late to run."

Red Dog Martindale survived that episode and

safety over the long haul

THE LONG HAUL

made it through the war. After the war, he joined the Naval Reserves. In 1949, he decided to switch to the Air National Guard. He joined the unit in Boise, Idaho. At that time, the Idaho Air Guard was flying P-51D aircraft.

In 1951, he was activated because of the Korean War. He worked on F-51s at Moody AFB, Georgia, and George AFB, California. On New Year's Eve of 1952, he was released back to the Idaho Air Guard. Two days later, his unit picked up the mission of air defense. And in October of 1953, the unit's Mustangs were replaced with F-86 Sabrejets.

In 1956, his squadron, the 190th Fighter Interceptor Squadron, was made a part of the 124th Fighter Group. The new unit was double the size of his old squadron, and the new Consolidated Aircraft Maintenance Squadron (CAMS) needed a first sergeant. In 1957, Red Dog Martindale became first sergeant and munitions shop chief for the CAMS.

From that time to the spring of 1964, the 124th transitioned from F-86s to F-94s, F-89s, F-86Ls, and finally F-102 Delta Daggers. As chief of the munitions shop, Red Dog was in charge of the safe loading, firing, and storage of many kinds of ordnance. He was also responsible for the tow targets used in the days of the F-86 and F-89. Back then, they were launched by hand during takeoff of the tow aircraft. For instance, the F-89 towed the target rag or sleeve by cable and straps connected to a 2- by 2-inch piece of wood lodged in the flaps. On takeoff, when the 1,000-foot cable was about out of slack, the ground crew threw the sleeve into the air. There was usually a spotter in the airplane in case something went wrong; it was much like a water-skiing operation.

Where was safety? "You preached safety then just like now," according to Chief Martindale. "We didn't have any great big manuals, like 127-100 or anything like that. You just didn't have accidents but once. You only have one chance."

From 1964 until 1975, the 124th kept their F-102s. Red Dog and his troops supported round-the-clock alert. Then in April 1975, the unit converted to the RF-4C and took over a reconnaissance mission as a TAC-gained unit.

Over 30 years, Red Dog Martindale has handled untold thousands of individual munitions—500-pound bombs, missiles, rockets, photoflash carts, chaff, and ejection-seat devices. His unit is the only Guard unit to twice receive USAF Missile Safety Plaques. Chief Martindale runs a safe operation.

How does he do it?

"You just preach safety," he says. "I am just like a school teacher. The only thing to my advantage is I can say 'if you don't do it right the first time, you may never get a chance to do it again!' That, my friend, gets a lot of people's attention."

TAC Safety Awards

CMSgt Walter J. Robbins

WEAPONS SAFETY AWARD OF THE QUARTER

CMSgt Walter J. Robbins is the recipient of the Tactical Air Command Weapons Safety Award for the third quarter of 1981. Chief Robbins is NCOIC of the Munitions Branch, 347th Equipment Maintenance Squadron, 347th Tactical Fighter Wing, Moody Air Force Base, Georgia. Chief Robbins developed a Safety Day program and was responsible for the expansion of the munitions storage area. He improved safety and morale through his Safety Day program by recording accident-free days for each shop on a project board. Shop supervisors then sponsored quarterly incentive parties to reward workers' efforts. Chief Robbins provided valuable inputs to a staff assistance visit team on the safety aspects of the munitions holding area, current and future munitions-storage siting and construction plans, and WRM stock requirements. Chief Robbins was selected 347th Tactical Fighter Wing NCO of the Quarter. His consistent, conscientious work has greatly improved morale; and his strong leadership and foresight in mission planning have earned him the Tactical Air Command Weapons Safety Award of the Quarter.

TSgt Christopher MacDonald

GROUND SAFETY AWARD OF THE QUARTER

TSgt Christopher MacDonald is the recipient of the Tactical Air Command Ground Safety Award for the third quarter of 1981. Sergeant MacDonald is squadron safety NCO and chief of the nondestructive inspection (NDI) shop, 56th Component Repair Squadron, 56th Tactical Training Wing, MacDill Air Force Base, Florida. He has developed an innovative and effective safety program for the squadron and his NDI shop. He totally redid the hazard abatement program and improved safety consciousness in the shops through a series of special-interest briefings and increased surveillance program. His NDI shop achieved several "saves" by identifying deteriorating power-train components before they failed. And there have been no radiation exposure incidents to shop personnel because of his outstanding X-ray safety program. His graphic X-ray presentations at the wing's monthly FOD prevention committee meetings have been a major contribution to the unit's excellent FOD prevention program. Due to his efforts, the squadron received an excellent rating in the wing's annual safety inspection; and the unit's ground safety management book and safety publications were rated the "best observed." Sergeant MacDonald's exceptional dedication and enthusiasm have resulted in a truly outstanding safety program and have earned him the Tactical Air Command Ground Safety Award of the Quarter.

SSgt Parris W. Veasley

SrA Tracy Hundley

CREW CHIEF SAFETY AWARD

SSgt Parris W. Veasley is this month's winner of the Tactical Air Command Crew Chief Safety Award. Sergeant Veasley is an O-2A crew chief with the 23d Tactical Air Support Squadron, Davis-Monthan Air Force Base, Arizona. While checking the sump on the right main fuel tank during the preflight check of his O-2A aircraft, Sergeant Veasley drained out fuel that was clear, oily feeling, and smelled like kerosene instead of Avgas. After taking a second sample, he summoned the expeditor vehicle. They agreed the Avgas was contaminated with JP-4. The expeditor notified job control, and all aircraft on the flight line were grounded. Lab tests confirmed the contamination in Sergeant Veasley's aircraft. The other aircraft were OK. The right main tank on Sergeant Veasley's aircraft was the first tank filled by a JP-4 truck in which the filler hose had been improperly drained when the truck was switched to carrying Avgas.

Sergeant Veasley's timely and proper action averted a possible disaster since the aircraft was scheduled for a flight with two pilots and full ordnance load. The right main tank, which was contaminated, feeds the rear engine of the O-2A. The rear engine produces most of the thrust; without it, the airplane would probably not have sustained flight. By his alertness and concern, Sergeant Veasley has earned the TAC Crew Chief Award.

INDIVIDUAL SAFETY AWARD

SrA Tracy Hundley is this month's winner of the Tactical Air Command Individual Safety Award. Airman Hundley is a munitions handling crewmember in the 33d Equipment Maintenance Squadron, 33d Tactical Fighter Wing, Eglin Air Force Base, Florida. His job includes the delivery of missiles and ammunition to and from the flight line.

Recently, Airman Hundley was on a routine trip to the combat-turn area to pick up munitions when he noticed an F-15 taxiing with one of its panels missing. The aircraft was leaving the combat-turn area and headed toward the quick-check area. Although it wasn't his specific responsibility, Airman Hundley acted. He notified munitions control of the problem, looked for and found the missing panel, and took it to the quick-check area. He notified the ground crew and gave them the panel. They notified the pilot, who shut down the engines while the ground crew replaced the panel. The pilot restarted the engines and took off safely and on time.

The quick response by Airman Hundley in solving someone else's problem shows his concern for others. He prevented possible damage to the aircraft and injury to the pilot. He is deserving of the Tactical Air Command Individual Safety Award.


CARKER
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1981

F-15

COURTESY OF
CAPT. MICHAEL L. CARAKER

Survival in Winter's Wonderland

All of us have something at stake when it comes to surviving in cold weather. The best study of actual cases of cold weather survival that we've seen was done by Richard A. Howard, Ph.D., and reported in the December 1970 issue of *TAC ATTACK*. As the cold weather now descends on us, let's gather around a hot stove and review that report.

Dr. Howard compiled his information from the crashes of 268 aircraft with 641 people involved. He was able to reconstruct the stories of 480 of those people who either lived to tell their tales or left behind enough information to tell it for them. The remaining 161 either died or are still missing. One man committed suicide rather than face the problems of survival.

In contrast to him are many stories of heroism and endurance against great odds. Two men parachuted from a transport and one was injured on landing. The other man carried and dragged his injured companion 150 miles to safety. Since they had no food or equipment, they had to forage along the way. The journey took 48 days.

One survivor was fortunate in finding trapper's supplies and cabins along his lonely route. He was out 84 days before he returned to base.

The longest experience in the stories is that of a crew isolated on the Greenland icecap. They were found and supplied by air after only a few days, but 164 days passed before they could be removed from the icecap.

The effects of extreme cold are both physical and mental. Some survivors came very close to mental breakdowns in combating the wintry environment.

The same weather that brings us a beautiful and nostalgic White Christmas is deadly when we have to survive in it. Some of us have flown for years without thinking about the possibility of having to survive on our own in a cold climate. We forget how cold it gets in the high country we fly over. And some of us, especially in ADTAC, Guard, and Reserves, are stationed where it really gets cold. Still others get a good taste of cold weather in exercises like Jack Frost.

HEALTH AND INJURIES

About 50 percent of the men involved in these survival episodes suffered injuries in the course of the descent, whether a crash landing or parachute landing. The injuries ranged from fractured skulls, broken legs, arms, and shoulder blades to sprains, bruises, cuts, and concussions. In two reports, broken limbs were set by a member of the party. One of these was set so successfully by a nonmedical man that resetting was not necessary when the party was rescued and taken to a base hospital. In all other cases, the fractures were immobilized by splints. Burns from fires in flight or on the ground following the crash were reported in 17 stories. Cuts occurred most frequently on the face; they were caused by glass breaking in the plane or by broken flying goggles. Fifteen cases of shock were recorded.

The impairments to health which took place following a successful landing or bailout were attributable, in the vast majority of cases, to the severe environment; they were frostbite, exposure, and malnutrition.

The survivors often showed a lack of training in the use and care of clothing. Men wore wet clothes, gloves, socks, and shoes and failed to dry them when the situation allowed it. They used cold tools with wet hands and learned better the hard way. They took off their gloves to wipe snow from the wings of the aircraft. Only after being frostbitten did they find life raft paddles ideal for the purpose. Others used their bare hands to scoop up snow to eat or melt. One man commented that he was so anxious to rush after the supplies dropped to him that he forgot to put on his foot covering; that resulted in wet feet and the eventual amputation of two toes. Another man landed his fighter safely, but walked around the plane and then sat in the cockpit all night with snow-filled shoes and wet feet. He had frostbitten feet by morning, and eventually he lost all his toes. Swollen, blistered hands, feet with such large blisters a man couldn't walk, loose skin on one finger, and loss of a fingernail were all reported in the case of three men who lived in an insulated hut. They had a fire over which they said they dried their sleeping gear, but never mentioned drying socks or gloves. They ended up with frostbite, frozen limbs, gangrene, and eventual amputation.

Treatment of frostbite was often wrong. Many cases were reported where the first aid given frozen or chilled feet and hands was rubbing with snow, rubbing with alcohol, rubbing with gasoline, or just simply rubbing. One survivor, who admitted being ignorant of cold weather first aid, treated a fellow crewmember's frozen feet correctly at first by putting them under his armpits. If he had stopped there and read the manual in the first aid kit in his plane, he wouldn't have then made the mistake of rubbing the feet for 2 or 3 hours. But as it was, the next day the victim's feet turned all colors of the rainbow; after his rescue, all the toes had to be amputated.

Others found preventing frostbite in fractured limbs a serious problem. The impaired circulation made keeping a broken hand or foot warm very difficult. The narrative of one crew whose seven members all suffered frozen hands or feet notes that a frozen limb doesn't feel cold—it simply aches.

Lack of knowledge of the principles of first aid was conspicuous. No treatment, inadequate treatment, or the wrong treatment of injuries occurred all too frequently, showing the men lacked the basic knowledge of first aid principles that all aircrews should have.

Living in a snow shelter, as some men did, proved dangerous if the men were not constantly aware of the frostbite problem and other effects of cold. The warmth of a man's body penetrating through layers of sleeping bags melted the snow or ice beneath. This, in turn, soaked the sleeping gear so that definite care had to be taken to dry it out. One survivor reported that his sleeping bag froze to the ice and had to be chopped free. Most men, however, cared for their sleeping gear and aired and dried it frequently. The survivors also found it necessary to insulate themselves from the snow and ice even when just sitting around. Fourteen cases of hemorrhoids were reported, most of them sitting on cold surfaces.

Chapped or sore lips, faces, and tongues followed eating or sucking snow or ice. Several survivors complained that snow only made them more thirsty and resulted in parched and burning throats. Additional snow did little to relieve these sensations and only added to the chapping.

Effects of cold wind were frequently noted. Many said the strong gales made breathing difficult and seemed to make the lungs burn.

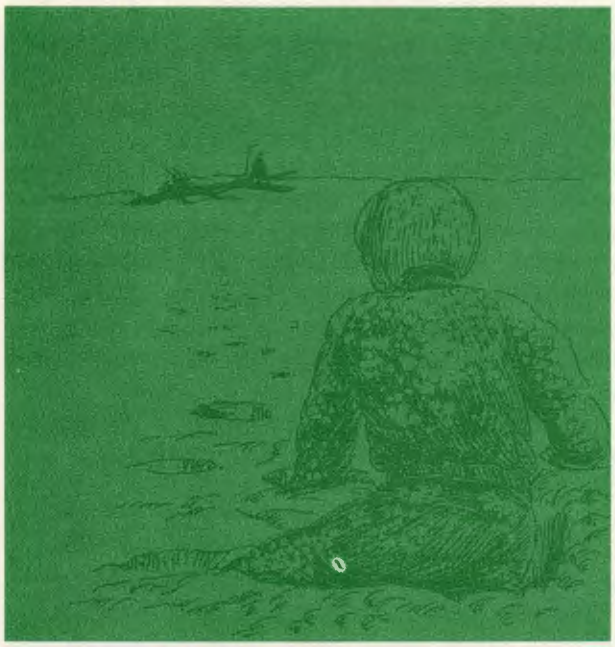
Glare bothered some survivors; they improvised snow goggles or wore smoked flying goggles. Red or sore eyes and swollen or dry, cracked eyelids were caused by the wind and the glare. Others stated they couldn't use the goggles for protection because the melting and freezing snow froze on them. A few men smeared oil or grease on their faces to prevent sunburn.

Winter Survival

FATIGUE

Perhaps the most common complaint was a progressive weakness when rations were limited. Fatigue set in quickly, so that work periods had to be limited to a few hours or to less than an hour in some cases. They tended to stumble more frequently in traveling and to misjudge their movements, bumping and bruising themselves in normal activities. Some reported being wet all the time from repeated falls because they were too weak to walk normally. Ankles in particular suffered from cold and bruises, which seemed to remain painful for longer periods of time than usual.

Peculiar attacks of dizziness were mentioned twice. In one case, they had trouble standing upright and seemed unable to orient themselves in the snowy landscape. In another story, the survivor reported that while digging on a snowy, hazy day, he stopped and tried to stand up; he promptly fell down,



unable to orient himself in a vertical plane. He said his semicircular canals failed to give him any indication of up from down. He found he could keep erect only when looking at the wreck of his aircraft, using it as an artificial horizon. These survivors may have been weak, but even people in good condition sometimes react the same way in a "white-out." When the light reflected by the snow is as intense as that from the sun, everything appears hazy and milky. There is no horizon, no shadow. In a white-out, a person on the ground has to probe his way.

Living under emergency conditions in severe cold can be exhausting, as the survivors' stories prove. All attempts to work in cold and in strong winds required expenditures of energy beyond the expectations of the survivors. Walking in deep snow or against the wind quickly exhausted them. Often they were too tired to build shelters on the trail and simply wrapped themselves in parachutes before falling asleep. Even breathing in the cold climate seemed to take more effort. The shortage of food and the altitude often contributed to their discomfort. Most survivors reported they were always fatigued, always tired.

Once rescued, more than half needed no medical attention other than rest. In other cases, severe effects from exposure and lack of food were evident. The effects of frostbite and frozen limbs were the most serious.

CLOTHING

The comment "inadequate clothing" occurs so frequently in the survival stories that preparation for an emergency was obviously lacking. They wore whatever clothing they wanted for the flight. When an emergency occurred, they often suffered from their poor choice unless additional apparel was carried in the plane or dropped to them later.

Wool clothing, summer underwear, coveralls, and flight jackets with gloves, helmet, low shoes and/or flying boots of some type made up the typical clothing of most of the downed flyers. Only a few flew suitably dressed for the experiences that followed. Those few had been carefully prepared either through previous emergency experience, survival indoctrination, or just considerable thought on the subject.

Most of the comments on clothing concerned footwear. Gloves weren't mentioned, except for the remark that they got wet. Hats were mentioned only once by a survivor, who reported he made one out of the fur collar of his flying jacket.

Clothing in several thicknesses was preferred so that layers could be removed while working or walking and then put on during rest stops and in the cooler hours of the day. The survivors constantly reported great difficulty in keeping their feet warm while resting. Thoughts of frozen feet and gangrene plagued them. To combat cold feet, they rested or slept with both shoes and socks on, wearing their mukluks or shoe pacs or with their feet wrapped in extra layers of parachute cloth.

Proper footwear was the exception rather than the rule. Leather oxfords, combat boots, hightop leather shoes, and tennis shoes were all inadequate or unsatisfactory. Most of those who mentioned mukluks approved them as ideal footwear for cold weather survival. They praised their convenience, comfort, and insulating properties when properly used. One man thought rubber footwear was possibly the most practical because snow wouldn't stick to it. Leather footwear tended to freeze and was described as like armor, concrete, or rocks.

Emergency repairs to clothing were usually made with pieces of parachute or tarpaulin sewn with unraveled shroud lines. All survivors praised the parachute as emergency material and valued it highly. All groups carried one or more parachutes with them, and every individual saved whole or selected parts of parachutes for shelters, bedding, insulation, repairs, and clothing.

WATER

In spite of the abundance of ice, snow, and water almost everywhere, many of the narratives mention difficulties in procuring drinking water. Snow is not as satisfactory a source of drinking water as ice, yet many survivors used it. Two injured men were dependent for water on the snow they could reach through the plane window. Various survivors who ate snow reported that their hands, lips, tongues, and mucous membranes were soon chapped, cracked, and bleeding. Snow proved unsatisfactory in other ways. Many reported, "No matter how much snow we sucked, we couldn't quench our thirst." At least 10 individuals complained that eating it caused a burning sensation in the throat. One man noted that he and several other members of his party who ate snow

directly or drank it melted suffered from diarrhea. In others, it caused severe gas pains and belching. They discovered that snow is difficult to melt and that tremendous quantities must be heated to supply even a small amount of water. Many concluded that melting snow is not worth the effort, for drinking water can be obtained from ice with less energy and fuel.

Both ice and snow had to be melted for drinking water in containers. They found it best to save one container for melting ice alone, because of the difficulty in cleaning those used for cooking or other purposes. One observant survivor noted that a solid block of ice melts as quickly as small cubes or shaved ice. Several mentioned that if the water was allowed to heat a little after the ice had melted completely, it kept better and provided a more satisfactory drink than when only slightly above the freezing point. Some found that a constant water supply could be maintained by adding ice and snow as needed to a container of water in their shelter.

PLAN AHEAD

It should be obvious from these reports that our physical condition and dress may well determine how we return to civilization—or if we will—in a survival situation. Such things as injuries, the length of the ordeal, the environment, and other variables will certainly have a bearing on the outcome, but we have no direct control over these things. So now, while we're sitting around the hot stove, before we leave for our next flight, we need to give some thought to where we're going and what we'll do and what kind of country we fly over. Let's hope for the best, but prepare for the worst.

chock talk

...incidents and incidentals with a maintenance slant.

JET FUEL STARTER FIRE

While the pilot was starting the number 1 engine on an F-15 overseas, the crew chief noticed smoke coming from the jet fuel starter duct. The pilot saw the AMAD (aircraft mounted accessory drive) light flash and then come on steady, so he pressed the AMAD light and fired the extinguisher. The pilot then exited the airplane.

The aircraft had recently gone through its first periodic phase inspection. During a quality verification inspection the jet fuel starter duct was found not seated correctly on the aft flange of the jet fuel starter; there was evidence of leaking. This information was entered into the aircraft forms as a red-X item. Two days later the duct was supposedly repaired by an airman and inspected by his supervisor the same day. Actually, the supervisor inspected the wrong area of the jet fuel starter. But the red X was cleared from the forms. The aircraft was released from phase inspection and put on the flying schedule. The first time it was used, the starter caught fire.

TROUBLESHOOTING: CAUSE OR EFFECT?

On base leg for a gunnery pass, the F-4 pilot noticed a fire light on the right engine. He pulled the throttle to idle; the light stayed on. The pilot shut the engine down; the light stayed on for 5 minutes and then went out. The pilot made an uneventful emergency landing. The investigators found that a connector on the aft fire loop of the right engine was dirty. After they cleaned the connector, the system checked good.

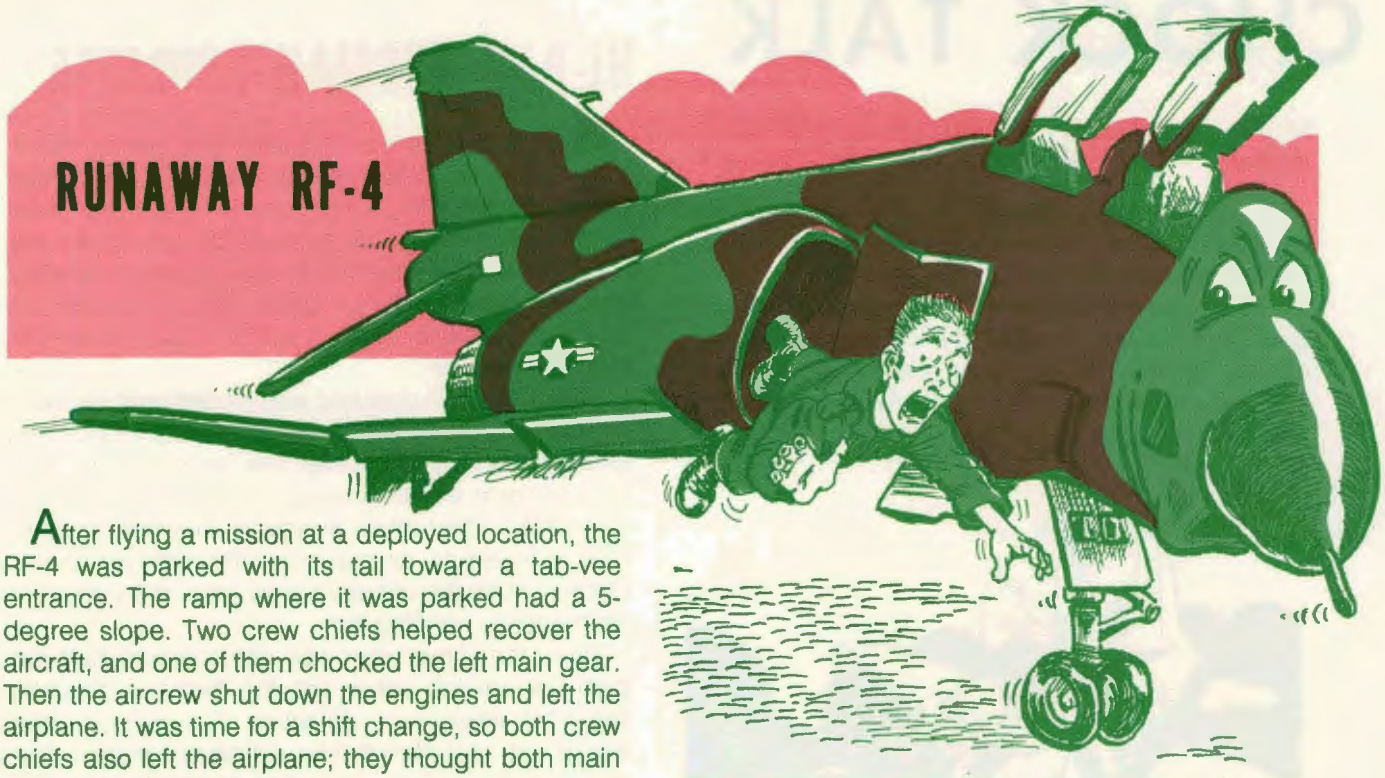
About a week later, the airplane was scheduled to fly. At 100 knots on takeoff, the fire light came on. The pilot aborted, shutting down the right engine. The fire light stayed on, and the aircrew exited the airplane after shutting down the left engine in the dearm area. This time the investigators found the aft fire loop shorted to ground on door 83. Maintenance removed and replaced the loop. The airplane flew 11 flights without incident.

On the 12th flight, the pilot noticed the right fire light after being airborne about 20 minutes. He pulled the throttle to idle, and the light remained on. When the pilot shut down the engine, the light stayed on, although it flickered out twice during the return to base. The landing was uneventful.

Again the investigators found a short to ground on the right engine's aft fire loop. Again it was in the area of door 83. This time, they investigated further; they found the fuel drain line was contacting the fire loop and causing the short. The reason was that the fuel line clamps were incorrectly installed. Vibration caused the intermittent contact in the area of door 83. They reinstalled the clamps and replaced the fire loop. That finally solved the problem.

Perhaps the greatest difficulty in troubleshooting is in separating cause from affect. The short in the loop was the result of the clamps being installed wrong; it was a link in the chain, not the cause. Sometimes we need to take it one step further back in the chain to find the true cause. Otherwise, we're just treating the symptom.

RUNAWAY RF-4



After flying a mission at a deployed location, the RF-4 was parked with its tail toward a tab-vee entrance. The ramp where it was parked had a 5-degree slope. Two crew chiefs helped recover the aircraft, and one of them chocked the left main gear. Then the aircrew shut down the engines and left the airplane. It was time for a shift change, so both crew chiefs also left the airplane; they thought both main gear were chocked.

About half an hour later, the crew chief from the second shift came out to do an intake inspection. While he was inside the intake of the number 2 engine, he felt something strange: the aircraft felt like it was moving. He looked outside; sure enough, it was. He scrambled out and got off the runaway. The crew chief thought about trying to chock it again, but by now it was moving too fast.

The aircraft rolled towards a couple of fuel trucks that were parked near a hot-pit refueling area across from the tab-vee. The driver of one of the fuel trucks looked up and saw the RF-4 bearing down on him. He cranked up his truck and drove out of the way.

The airplane rambled across the taxiway and struck the right rear of the second fuel truck. It hit the truck with its right wing and was turned to the right, but it kept on rolling into the refueling pit. The left drop tank banged into part of the refueling pit's plumbing. The nose gear jumped a curb and a hot-pit refueling cover; the right main gear just jumped the curb. The aircraft finally came to rest with the left main gear in the refueling pit, the right main gear off the taxiway on an unstressed surface, and the nose gear sunk 6 inches in the grass and mud.

While all this was happening, the guys who were responsible were long gone. Bet it was a shock when they came looking for their airplane the next morning.

CARELESS DRILL

The F-4 aircrew climbed into the airplane and got ready to start engines. When external electrical power was applied, both wing tanks jettisoned. The crew chief was able to put out the small fire that resulted; and no damage, other than the loss of the tanks, resulted. Since all the switches were in the correct position, a spurious stray voltage seemed to be the cause.

The incident was the culmination of a series of electrical problems this aircraft had been suffering. They all began after the airplane had been struck by a bird, which extensively damaged the right variramp and the inside of the intake duct. A depot team repaired the damage; but in doing so, they apparently drilled into the F-4's electrical wiring. After the drilling, 206 wires had to be spliced. That created plenty of opportunity for the spurious voltages which plagued the aircraft.

This case should remind us when we're working on aircraft that there are critical items—wire bundles, hydraulic lines, flight control cables, and the like—just under the skin. Our airplanes simply can't tolerate carelessness.

CHOCK TALK

MOD SQUAD BLOWS CANOPY

An AT-38 was preparing for a functional check flight following a 300-hour phase inspection. While holding short for the runway, the pilot heard a whining noise and decided to open the canopy to investigate. As he pulled back on the canopy handle, the canopy opened so suddenly and forcefully that it separated from the aircraft. As it came off, it hit the rear canopy, damaging it also.

The way the canopy separated led the investigators to suspect that the cockpit had overpressurized. In the course of investigating the pressurization system, they found an illegal modification. Someone had attached a tube to the cockpit pressure relief port, apparently to make pressurization checks on the aircraft easier. The tube was about a quarter of an inch in diameter and had a fitting on the end like a hydraulic line.

Maintenance training emphasizes capping open hydraulic lines. So during phase inspection, the illegal tube to the pressure relief was mistaken for a hydraulic line and capped. With the relief port blocked, pressure rapidly built up when the canopy was closed. When the canopy was then unlocked, the overpressure caused it to separate.

This is an example of why modifications must go through a long process of coordination before they are approved. Any change we make will affect others in ways that haven't crossed our mind. When we have an idea for a modification, let's use the system instead of short-circuiting it.

HI-PAC RUSSIAN ROULETTE

A crew chief and his assistant were getting ready to put air in the nosewheel tire of an RF-4. They were using a hi-pac (MC1A compressor), which the crew chief started. After the pressure built up, the crew chief checked it. The needle was bouncing around 50 psi on the low-range gage. Using the high-low pressure regulator, he set about 2,500 psi on the high-range gage.

The crew chief checked with his assistant to see if he was ready to begin servicing. He was, so the crew chief cracked open the high-low service valve. They couldn't hear any air flowing; the crew chief opened the valve a little further. Suddenly, they heard a loud hiss, followed by an explosion. The tire had blown. Debris struck the assistant crew chief in the left eye, permanently blinding him.

When the compressor was later checked, both the high-low service valve and the high-low pressure regulator valve were defective. The service valve would not seal completely; indications were it had been overtorqued. The malfunctioning high-low pressure regulator valve would not allow the operator to accurately set or control air pressure on the low-range gage. When the regulator valve was moved to increase pressure, the low-range gage stuck at 50 psi. Actual pressure increased, but the gage remained at 50 psi. Pressure could be increased all the way into the high range without the low-range gage reading above 50 psi. In this case, the high-range reading of 2,500 psi was the accurate reading; the low-range reading was meaningless. The high-pressure air blew the tire immediately.

As the investigators checked other hi-pacs, they found the regulator problem was an epidemic. Nine air compressors were inspected, and seven of them had bad regulators. Not only that, most of the workers knew the hi-pacs weren't working right. But their supervisors didn't know about the problem. Frustrated with the faulty equipment, the workers devised their own ways of working around the problem. They began using the service valve as a regulator. That, of course, contradicts the tech data, which warns against using high-pressure air to service tires.

A one-time violation of tech data can often cause a mishap; but when normal work routines disregard the tech data, a mishap becomes the certain result. It's no longer a question of whether, but when. By not reporting the malfunctions and getting them fixed, the workers in this unit were playing Russian roulette with hi-pacs.

AGGRESSIVENESS

by Captain Jeffrey R. Riemer
F-16 Acceptance Test Pilot

Aggressiveness: What does it mean to you? It seems that it means something different to everyone you ask. The dictionary defines *Aggressiveness* as "Energetic pursuit; devotion to a cause; bold self-confidence in expression." I think we can all agree with these, but I thought it would be interesting to poll a cross section of pilots and come up with a composite definition directly related to flying.

To ask this question of only one command, like TAC, SAC, or MAC, would definitely skew the definition to the type of flying being done; so I took the opportunity while recently serving in an ATC wing to poll pilots from all the major flying commands (TAC, MAC, SAC, and ATC). The following are some of the definitions I received:

- Ability to make a decision concerning control inputs.
- Acting in a timely manner to implement decisions.
- Definite, confident aircraft control.
- Attitude to fly the best mission possible in the most efficient and common-sense way.
- Ability to see small changes and correct them quickly and smoothly.
- Desire to be on top of things, constantly thinking ahead.
- Attitude of taking charge.
- Flying the aircraft; not letting it fly you.
- Maneuvering your aircraft as necessary to produce positive results.

Comments like these were numerous. By cutting and pasting the inputs, I formulated the following composite definition which I think all pilots can relate to and benefit from:

Aggressiveness: A positive attitude toward mission accomplishment that results in maximum success through precise aircraft control. To achieve maximum success, it may require smooth control inputs or abrupt control inputs; but in all cases, these inputs should be appropriate for the situation. It's a take-charge attitude tempered with knowledge, wisdom, and judgment that produces the best job in the most efficient and common-sense way. It's an eagerness to correct deviations and strive for perfection, which results in you making the aircraft do what you want it to while maintaining flying discipline and safety. And lastly, it's knowing your procedures, your personal limits, your aircraft's limits, and exploring these limits safely, but with *GUSTO*.

HOLIDAYS SHOULD BE HAPPY DAYS

by MSgt Bill Hester
507 TAIRCW Ground Safety

"Holidays are happy days!" We've all heard this expression many times. But, in a typical year, over 3,900 people in holiday accidents will never see another holiday or "happy" day. That's how many people are killed on our highways just on Memorial Day, Fourth of July, Labor Day, Thanksgiving, Christmas, and New Year's. In addition, over 2,000,000 people are injured.

We've also heard, "Figures lie and liars figure"; so I won't carry the numbers bit any further. I just thought you might like some mind-blowing statistics on holiday traffic injuries and deaths. All this is just to illustrate the real point: Holiday traffic can be fatal if you don't practice all the defensive driving techniques you have learned, including the use of restraint devices, the greatest life savers since the invention of the automobile "killer."

Some common excuses for not wearing seat belts are: (1) "I might be saved if I'm thrown clear of the car in an accident"; (2) "If I wear a safety belt, I might be trapped in a burning or submerged car"; (3) "It takes too much time and trouble to fasten my safety belts"; or (4) "I'm uncomfortable and too confined when I wear a safety belt." None of these are good reasons to die or be severely injured. The facts are that your chances of being killed are 25 times greater if you're thrown from the car. Forces in a collision could throw you up to 150 feet, scraping you along the ground, hitting a pole, bridge abutment, or some other object along the way. In almost any collision,

you're better off being held inside the car by safety belts. Less than one-half of one percent of all injury-producing collisions involve fire or submersion. Even if either did occur, with safety belts you're more likely to be unhurt, alert, and capable of escaping quickly. Considering the time or trouble: if you want to live, that much time and trouble you can live with. Sure, seat belts cause some discomfort at first; but, eventually, you'll begin to feel uncomfortable without your seat belts.

The point is: Seat belts do save lives. Let's all buckle up and ensure our holidays are happy days.

SMOKE DETECTORS RECALLED

TYNDALL AFB, Fla. (AFNS)—Defective smoke detectors are being recalled by the Chloride Pyrotector Division of Chloride, Inc., Hingham, Massachusetts.

Faulty commercial and residential battery-operated smoke detectors are being recalled because a potentially defective microchip may prevent the alarm from sounding.

Some of the detectors were sold through the Army and Air Force Exchange Service to European customers until April 1981, officials with the Air Force Engineering and Services Center here say.

Potentially defective detectors are:

- Chloride Pyrotector Models 3077, 3078, and 3079.
- Archer No. 275453.
- Masterguard MGB-360.
- Vanguard 817.
- Protector Systems P365.

Owners should remove the back plate of the detector and check the model or code number. Potentially defective models will have a six-digit date code between 030179 and 031581.

BOOZE AND EMOTION

The man had been drinking, and he was burning up with anger. Under the influence of liquor and anger, he left the house, got in the car, and drove—but not far. A half mile away, he lost control, crossed the center line, left the road, and struck a tree. The impact destroyed the vehicle. He died 3 days later

from the massive injuries he suffered. Seat belts had been available, but not used.

Getting angry when drunk isn't that uncommon. Booze fuels the emotions. When we're happy, it makes us giddy; when we're mad, it makes us lose control. In either case, we don't belong behind the wheel.

Anger alone increases the risk of an accident. And, contrary to popular myths, we don't feel better after blowing our tops. An American Medical Association study shows that we feel irritable and tired after losing our tempers. That means we can't concentrate well on what we're doing and we're asking for an accident. The odds say that we'll gain nothing but we may lose everything when we lose control of our tempers.

HOLIDAY HINTS

To help you have a happy and healthy holiday, we're passing on some tips from the U.S. Consumer Product Safety Commission:

Trees. If you are planning to buy a natural tree, the most important safety factor is its freshness. The higher the moisture content of the tree, the less likely it is to dry out and become a serious fire hazard. One way to insure that a tree is fresh is to cut it yourself. Tree farms are within a short driving distance of many locations.

Before you buy a cut tree, check it for freshness. There are several things you can look for: Brittle branches and shedding needles are a sign of dryness; fresh needles bent between the fingers won't break. Tap the tree lightly on the ground; if many needles fall off, the tree is too dry. Don't depend on a nice green color—trees may be sprayed green to improve their appearance.

When you bring a tree home, keep it outside, if possible, until you're ready to decorate it. Keep its base in water. When the tree is brought in, cut the butt end diagonally 1 or 2 inches above the original cut. Place the tree in a sturdy, stable holder with a wide base. For additional stability with a large tree, fasten it to the wall or ceiling with thin wire from at least two points. Fill the holder with water until the cut line is covered; and keep the water at this level while the tree is in use, refilling it every day if necessary.

Set your tree up a good distance from any heat source. Don't rely on any do-it-yourself external flameproofing treatments since they are virtually impossible to apply correctly at home. Dispose of the tree when the needles begin to fall off in large quantities. This is a sign that it is becoming dangerously dry.

Metal trees, on the other hand, present no fire hazard in themselves. However, they can be the source of a serious shock hazard if electric lights are attached to the tree. Sharp metal edges may cut the cord insulation; the metal needles might touch an electrically charged component. Either way, the whole tree will become electrically charged, and anyone touching the tree and a grounded object at the same time could receive a severe shock. The only way to illuminate a metal tree safely is to use colored floodlights placed in different areas of the room. Since the floodlights become quite hot, they

should be positioned where children can't come in contact with them.

If you purchase a plastic tree, get one made of fire-resistant material. This doesn't mean that the tree will not burn, but only that it will not catch fire easily. As with natural trees, you still must keep it away from heat sources.

Lighting. First, purchase lights that have been checked for safety; look for the UL label of Underwriters' Laboratories. Then check your tree lights and outdoor lights each year before you use them. Look

for frayed wires, loose connections, broken or cracked sockets, and spots where bare wire is exposed. Any set that is damaged should be thrown out or repaired. Careful handling of these products during unpacking, decorating, and repacking will lessen the chance of hazardous damage.

All lights should be fastened securely to the tree. No light bulbs should come into direct contact with the needles or branches. Curtains and other flammable materials should also be kept away from bulbs. Then, when plugging the bulbs in, don't overload extension cords. Don't put more than three sets of lights on any extension cord. Keep the cords away from the water supply of a live tree.

Outdoor lights should be weatherproof and clearly identified as designed for outdoor use. Don't try to use indoor lights for outdoor lighting. Remove outdoor lighting as soon as the season is over; even these lights are not designed to withstand prolonged exposure to the elements.

When you leave the house or retire for the evening, be sure that all lights are turned off by unplugging them from the wall outlet. As with any electrical appliance, unplug by grasping the plug, not by pulling on the cord.

Though it may provide a sense of nostalgia, never use wax candles on or near a tree; they are a very serious fire hazard. Any decorative candles should always be kept well away from children and any flammable materials, such as pine boughs.

Ornaments and Trimmings. Avoid placing breakable ornaments or ornaments with small detachable parts on lower branches where small children or pets can reach them and knock them off. Every year many

children are treated for cuts from broken ornaments or for swallowing ornament parts.

Some traditional holiday decorations may be harmful if eaten, and this poses a hazard for young children. Mistletoe and holly berries are poisonous and may be dangerous if more than a few are swallowed. These plants should be kept out of the reach of children. Don't use tinsel or artificial icicles that contain lead. Discard old tinsel if you aren't sure of its composition. Those fire salts, which produce a multicolored effect when thrown on a wood fire, also contain heavy metals and could cause serious gastrointestinal problems if eaten.

Finally, make sure that the trimmings you use on the tree or around the home are noncombustible or flame resistant.

Follow these hints in your Christmas decorating, and the odds are much better that you'll enjoy the holiday season.

335th SETS F-4E RECORD

In September, the 335th Tactical Fighter Squadron "Chiefs" passed 80,000 flying hours without a major mishap. The Chiefs, from the 4th Tactical Fighter Wing, Seymour Johnson AFB, North Carolina, are the first F-4E squadron to do so. The squadron hasn't had a major mishap since 1969, before it got the F-4E.

The record is even more impressive because it includes periods of high-risk operations, including a deployment to Ubon, Thailand, in July of 1972. The squadron then participated in Operation Linebacker over North Vietnam. More recently, the squadron has participated in CRESTED CAP deployments to Germany in support of our NATO commitment. The 335th has deployed to Spangdahlem Air Base, Lahr Air Base, and twice to Ramstein Air Base.

In February of 1980, the squadron began converting to the new ARN-101-modified F-4E; and the unit became the first operational squadron to be completely qualified in this improved version of the Phantom.

The 80,000th hour was achieved on a normal ground attack mission. The aircraft commander for the mission was Capt Andrew R. Tuson and the weapons systems operator was 1st Lt Keith A. Coleman. SSgt Wayne Devall was the crew chief of aircraft #73-1180, which flew the mission.

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TAC TALLY

	TAC			ANG			AFR		
	OCT	THRU OCT		OCT	THRU OCT		OCT	THRU OCT	
		1981	1980		1981	1980		1981	1980
CLASS A MISHAPS	0	29	26	1	6	11	0	1	3
AIRCREW FATALITIES	0	17	17	1	3	10	0	1	1
TOTAL EJECTIONS	0	25	27	0	2	9	0	1	3
SUCCESSFUL EJECTIONS	0	22	22	0	1	5	0	0	2

TAC'S TOP 5 thru OCTOBER '81

TAC FTR/RECCE		
class A mishap free months		
44	33 TFW	
37	1 TFW	
36	31 TTW	
24	49 TFW	
23	355 TTW	

TAC AIR DEFENSE	
class A mishap free months	
105	57 FIS
58	5 FIS
55	48 FIS
14	318 FIS
5	87 FIS

TAC GAINED FTR/RECCE		
class A mishap free months		
114	188 TFG	(ANG)
106	138 TFG	(ANG)
105	917 TFG	(AFR)
102	116 TFW	(ANG)
92	434 TFW	(AFR)

TAC GAINED AIR DEFENSE	
class A mishap free months	
92	102 FIW
88	177 FIG
54	125 FIG
37	119 FIG & 142 FIG
27	144 FIW

TAC/GAINED Other Units		
class A mishap free months		
147	182 TASG	(ANG)
140	193 ECG	(ANG)
135	26 ADS & 4787 ABGp	
131	110 TASG	(ANG)
127	USAFTAWC	

CLASS A MISHAP COMPARISON RATE 81/80

(BASED ON ACCIDENTS PER 100,000 HOURS FLYING TIME)

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
TAC	1981	4.0	3.0	3.2	5.6	6.0	5.9	6.3	6.2	6.0	5.3		
	1980	2.0	4.0	5.2	4.4	4.7	5.2	5.3	5.2	4.8	5.1		
ANG	1981	9.3	4.8	4.6	3.3	2.6	2.2	1.8	1.6	2.4	2.6		
	1980	5.0	7.6	6.6	7.1	6.5	6.1	5.8	5.1	5.0	5.0		
AFR	1981	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.4	3.0		
	1980	0.0	0.0	0.0	0.0	0.0	4.3	3.7	6.5	8.9	7.9		

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