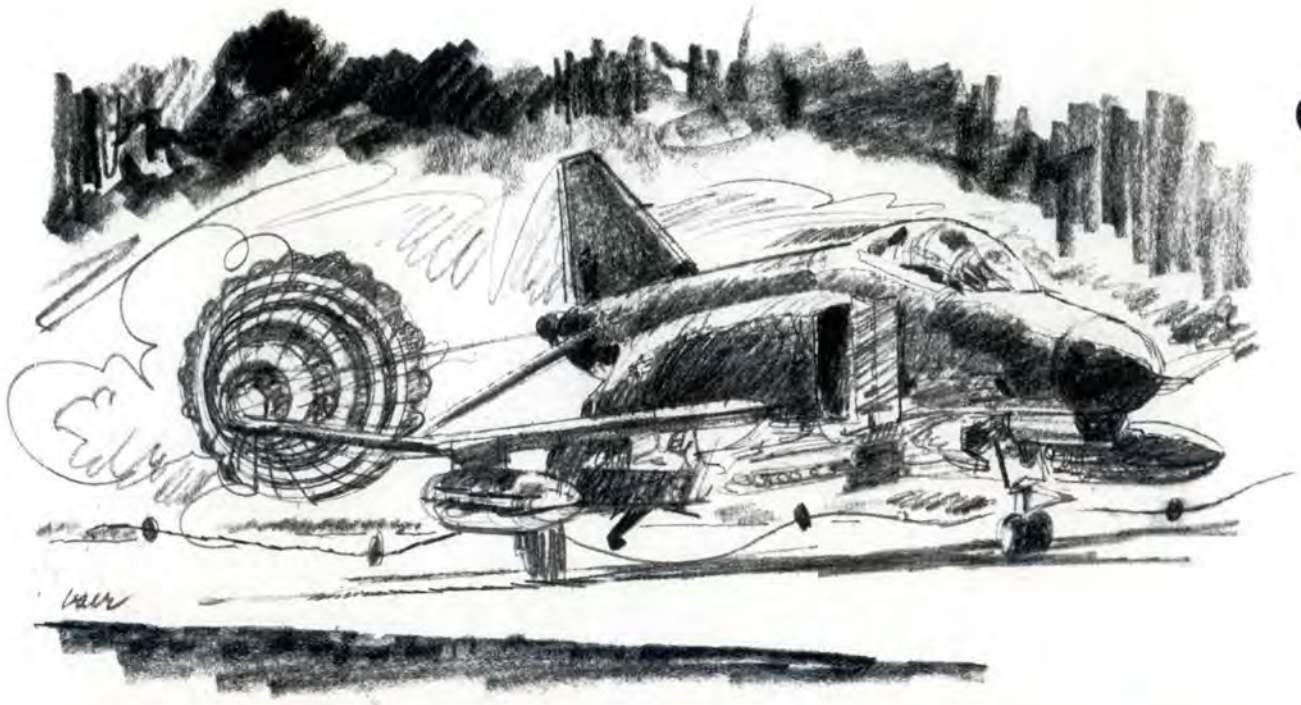
flying
SAFETY
MARCH 1989

SPECIAL ISSUE
Mishap Review and Forecast

Observation and Training Aircraft



THERE I WAS

■ The mission was another chance to beat up on a P-3 and B-52 during our ORI. After a number of kills and generally hurtling around as fast as my WSO and I could stand (are we havin' fun yet?), we bingo'd back to base and set up for the required, simulated weapons-loaded straight-in. Knowing the airplane had to turn and the maintenance guys would appreciate any extra time I could give them, and also just for the fun of it, we did a warp-6 recovery pressing in to 5 miles or so. Then it was the proverbial *%$@ and elbows to slow down, drop the gear and flaps, call tower, and land . . . no sweat.

But we *did* cross the threshold a little fast, like 30+ knots — nice long runway, no problem — and at least I wasn't high on final. Touched down about 2,000 feet down the 10,000 foot tube (never did get all that airspeed bled off), and the GIB called "good chute." "Now just let the antiskid do its thing, and we'll be eating lunch in 15 minutes. Hmmm, don't seem to be getting much deceleration, but then we're still a bit fast, so the antiskid is probably still cycling (as the back seater calls 4,000 feet, and I still see 100 knots). I'll just put a little more pressure on the brake pedals — there goes the 3,000 foot remaining marker, and 90 knots. Gee, I wonder if I should put the hook down for the departure end cable?"

As the nose approached the cable, I swallowed my pride and slammed the hook handle down. The way I figure, it hit about 10 feet past the wire. Now my eyes are getting BIG, the end of the runway is more than *just* in sight, along with the ditch at the end of the overrun, and my legs ache from the pressure I'm putting on the pedals. Still no tremendous sense of deceleration, and I'm cursing myself for hotdogging it by being so damned fast and accepting the speed instead of going around.

About 800 feet before the overrun, a thought flashes through my mind about some antiskid writeup I'd seen in the 781 . . . feet off the brakes, grab a handful of paddle switch, feet back on the brakes just as we pass into the overrun at about 30 to 40 knots. We stopped about 150 feet past the runway threshold, in a *very* foreign object filled overrun. About this time, as I'm beginning to breathe and start a 180, tower comes up (thank God they can't see this corner of the field) and asks if we're having any difficulty. "No, request taxi-back."

Some after-the-fact analysis:

■ I'd read in the 781 before accepting the jet that the antiskid had released brake pressure at low

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flying

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CONTRIBUTIONS

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SPECIAL ISSUE

We experienced another great year in 1988! We had 55 Class A mishaps in FY88 and for the fifth year in a row, our Class A mishap rate remained below 1.8. In this issue, we take a look at how we did in FY88 in our training and observation aircraft and summarize our mishap ejection experience.

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** — One copy for each six aircrew members. One copy for each 12 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.

OA-37

MAJOR WALLACE COATES
Directorate of Aerospace Safety

■ As the OA-37 is replaced with newer weapon systems, the number of USAF units flying the aircraft continues to decline. Currently, there is only one active duty unit and three Air National Guard units flying OA-37s. This will be reduced further in the coming year when one of the guard units replaces its OA-37s with A-10s. The aircraft will, however, continue to see extensive service worldwide through foreign military sales. It is used by numerous air forces in Central and South America and in east Asia.

Mishap History

Since the A/OA-37 became operational in 1967, the fleet has acquired over 690,000 flying hours. During this time, we have experi-

enced 35 Class A mishaps which destroyed 30 aircraft and resulted in 25 fatalities. Twenty-two of these mishaps were due to operational factors, 10 were logistic related, and 3 were categorized as miscellaneous or undetermined. The lifetime Class A mishap rate of the aircraft is 5.1 per 100,000 flying hours, a rate which is somewhat higher than the A-10 and slightly better than the A-7.

FY88 Mishap

AFISC analysts predicted one Class A mishap for the past year and, unfortunately, they were correct. The mishap aircraft was flying a local training sortie. It departed controlled flight when the pilot apparently attempted an abrupt maneuver in reaction to a radio transmission from a second OA-37. The pilot, unable to recover, ejected seconds before impact. The other crewmember did not attempt ejection. Both were fatally injured.

Problem Areas

A review of Class C and High Accident Potential (HAP) Reports indicates few problems with the aircraft other than those related to the engine. As with other J85 powered aircraft, engine flameouts are by far the leading cause of reportable incidents. With nearly one flameout reported for every 1,000 hours of flying, the OA-37 flameout rate, while not as bad as the F-5, is significantly higher than the T-38.

Airflow interruption, due to inlet design, is a major factor. SA-ALC has conducted studies in an attempt to design a fix, but funding is a problem for any major modification. An improved inlet seal proposed by the SA-ALC and proper engine positioning upon installation may help to alleviate some of the problem, but more than likely, we will have to live with flameouts for the foreseeable future.

The FY89 Challenge

Even though there will be a reduction in OA-37 flying time, AFISC is still predicting one OA-37 mishap in FY89. As with most fighter/attack aircraft, mishap history for the

OA-37 shows collision with the ground and loss of control to be the high threat areas. Recent history confirms the trend, with three of the last six mishaps related to low-altitude operations and one due to pilot-induced loss of control. Obviously this is where we need to place emphasis in mishap prevention. Operators, the ball is in your court. You need to stress these high threat areas in every mission brief.

Another potential problem area as the aircraft is retired is complacency. As operators and maintainers both look forward to a new weapon system, they may have the tendency to neglect the current aircraft. Be alert and continue to stress quality work and discipline up through the last day.

As the OA-37 community shrinks, any mishap is bound to strike close to home. There's not that many "other guys" left. But a mishap does not have to occur. The AFISC prediction is merely the result of a statistical look at recent history. The analysts don't have a crystal ball. You can prove them wrong. Keep the pressure on for safe operations, and let's go mishap-free in FY89. ■

OV-10

LT COL HORST K. KRONENWETT, GAF
Directorate of Aerospace Safety

■ With the OV-10 approaching 900,000 lifetime flying hours, an engine failure over high terrain caused the first OV-10 loss for the USAF in 6 years. USAF OV-10s flew over 31,000 hours in FY88, crediting them with a Class A mishap rate of 3.2. Seventy-six OV-10s still remain in the USAF inventory.

In FY88, OV-10 operations ceased at two locations (Patrick AFB, Florida, and Wheeler AFB, Hawaii). These Broncos were transferred to Shaw AFB, South Carolina, and Davis-Monthan AFB, Arizona. The new sites will lessen the corrosion problem, enhancing flight safety.

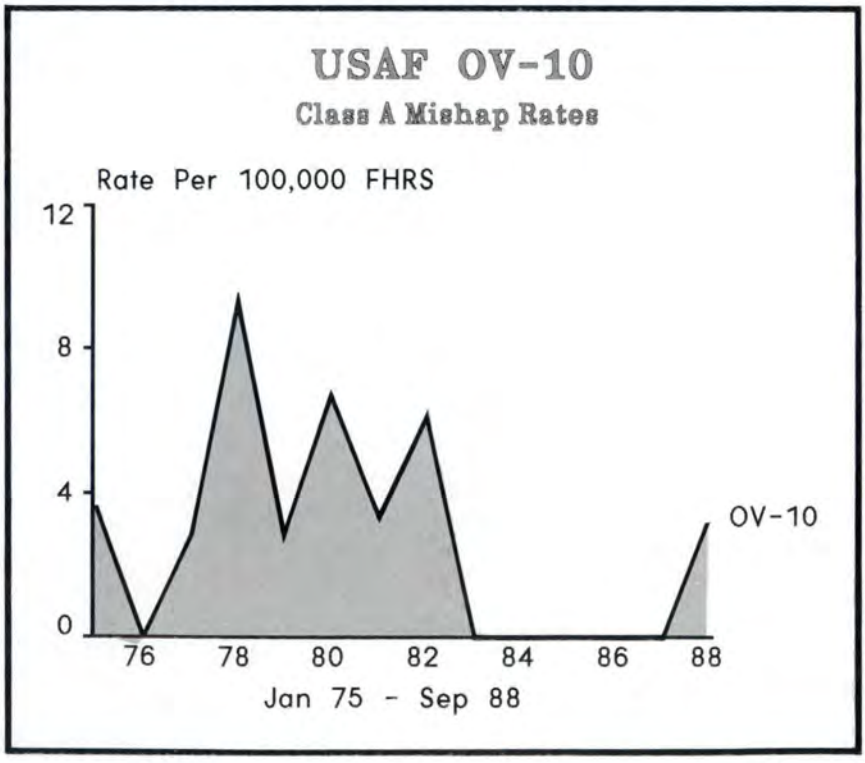
The Class A Mishap

Due to compressor bearing failure with subsequent compressor shift, the no. 1 aircraft of a two-ship formation lost one engine during a cross-country flight. High terrain and high ambient desert temperature prevented single-engine level flight or drift down to an emergency field.

About 2,000 feet AGL, it became obvious they would not clear the terrain and the crew abandoned ship. Their escape was successful; the aircraft was destroyed on impact. Investigation proceedings continue until the Air Force final position can be established.

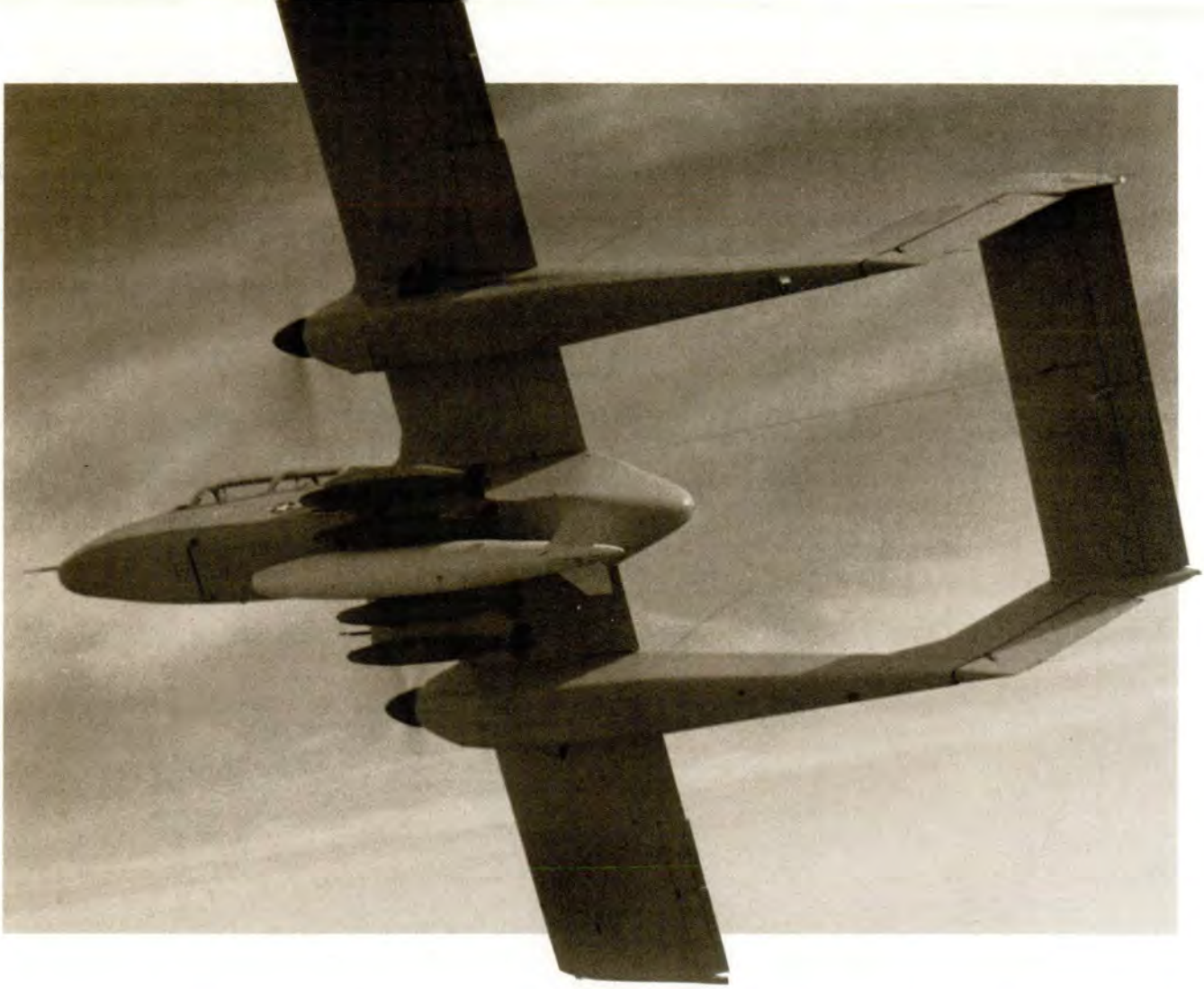
This mishap dramatically demonstrates that the OV-10 inherited marginal power for normal two-engine operation and insufficient power, in most situations, with only one engine operating.

Mishap statistics since 1965 show that of 39 Class A mishaps, 7 occurred after 1 engine lost power. It is clear that single-engine operation is a great contributor to our Class A mishaps. On the other hand, in most cases, the pilots have been successful in recovering the aircraft if we consider how often we have lost engines in flight.



Class C Mishaps

In last year's issue of this magazine, I complimented OV-10 supervisors, fliers, and maintainers for the professional flying demonstrated in beating the odds and landing safely after experiencing 18 in-flight engine failures, flameouts, and shutdowns. In FY88, another 12



such Class C mishaps were reported. Again, you handled potential Class A situations professionally as before. Compliments!

(A note to people who do not know the OV-10. It has the characteristics of a single-engine aircraft even with both engines operating. With one engine lost, it's almost like an engine failure on a single-engine jet.)

For your information, I broke out all reported OV-10 Class C engine related mishaps.

Your normally underpowered OV-10 aircraft, combined with the fairly frequent loss of an engine in flight and only one Class A in 6 years, is proof OV-10 supervisors and operators did a great job in keeping flight safety at the highest standard.

Still, remind yourselves always, and consider during flight planning and flight execution, that the Bronco OV-10 **hates high** temperatures, **high** altitudes, **high** terrain, and, especially, any combination thereof. Our FY88 mishap is a solid reminder of this reality.

OV-10 ENGINE RELATED CLASS C MISHAPS

FY87 In-flight Failures		FY88 In-flight Failures	
Cruise	14	Cruise	11
Low level	1	Final approach	1
After takeoff/departure	2	Total	12
Final approach	1		
Total	18		

That this type mishap was kept to a minimum over the entire USAF OV-10 history proves OV-10 operators have mastered their machine.

Safety Modifications

Due to intense corrosion, a refurbishment program (PACER BRONCO) will be performed on all USAF OV-10s at Hill AFB, Utah, during the next 4 years.

After completing an aircraft critical inspection for the corrosion control program, maintenance at each base will determine which aircraft will be modified first. PACER BRONCO includes:

- Paint stripping
- Corrosion treatment
- Overhauling landing gear
- Stick grip modification
- New external tank wiring
- Radar warning receiver (RWR) installation
- Secure voice installation

continued

OV-10 continued

■ Bearing distance heading indicator (BDHI) for rear cockpit

This program is *not* a life extension program for the present structural life limit of 15,000 flying hours; however, it will extend the life cycle beyond the year 2000.

Another topic during the past years has been replacement of the cracking, tip-losing aluminum propeller blades with ones made of fiberglass. The high cost of $175,000 per aircraft had, until the end of FY87, prevented the start of the testing program.

However, the new blade inspection criteria, implemented by a TCTO since Oct 86, have stopped further propeller/tip failures. Even though this item does not constitute a flight safety problem any more, your HQ AFISC flight safety action officer is further pursuing the proceedings through frequent contacts with the OV-10 System Program and Engine Item Manager at both Kelly AFB, Texas, and Warner Robins AFB, Georgia.

Let me tell you what else the OV-10 System Program Manager has relayed to me. Since we obviously do not prop reverse as much as we used to and, instead, tax the wheel brakes more on landing, the latter wear out frequently. The problem has been moved from the propeller blades to the brakes, which by design were never intended to be used for landing deceleration; prop reverse instead was foreseen to do the job. To improve the service life of the brake assembly, several of its component parts are currently being redesigned.

FY89 Mishap Forecast

Our analysts predict a rate of zero for the OV-10.

I will leave HQ AFISC in 1989 and return to Cologne, Germany. This is my last yearly article for you. My bequest to you OV-10 supervisors, fliers, and maintainers is live up to the challenge of the zero forecast as you have repeatedly done in the past.

Fly safely, Hals-und Beinbruch — (Break your neck and leg).

Your OV-10 flight safety action officer. ■

T-37

MAJOR WALLACE COATES
Directorate of Aerospace Safety

■ When and if the Air Force buys a new basic jet trainer, we can only hope to be as wise as those who selected the T-37. Air Training Command has been training pilots in the T-37 since 1957. Thirty-two years of efficient, effective, and exceptionally safe operations for a jet trainer is a superb record.

Current plans call for a replacement trainer sometime in the mid or late 1990s, but don't hang your hat on it. They have been touting the demise of the "Tweet" for the last 10 years, and it's still going strong.

Mishap History

Since 1956, when the T-37 first flew, the fleet has acquired over 10 million hours of flight time. During this time, there have been 127 Class A mishaps, destroying 124 aircraft, and resulting in 73 fatalities. The lifetime Class A mishap rate for the aircraft is 1.3 mishaps per 100,000 flying hours — not bad considering the aircraft's mission as a basic trainer. To put this in perspective, the lifetime mishap rate of the T-33 was 13.7.

In FY88, there was one T-37 Class A mishap. This equates to an annual rate of 0.31, well below the USAF rate of 1.65. The following is a summary of the mishap:

■ During the pullup for an immelman, the pilot grayed out and lost consciousness due to an improper anti-G straining maneuver. The aircraft stalled, then entered a left spin. When the pilot regained consciousness, he recognized the out-of-control situation and applied spin prevention procedures, but was unable to effect a recovery. Approaching his predetermined minimum altitude, he initiated a successful ejection.

FY89 Forecast

AFISC analysts predict there will not be a T-37 mishap during this year. Given the record of the past few years, this is certainly an attainable goal; however, meeting it will take the same disciplined effort that you managed from September

continued

T-37 continued

1986 through June 1988 when we went 21 months without a Class A mishap.

Problem Areas

Class C mishap reports indicate a very high rate of physiological incidents in the T-37. Factors that influence this high rate are the experience level of the student pilots (first exposure to flying high performance jet aircraft), an unpressurized cockpit, a poor air-conditioning system, and an incredibly high G onset rate.

GLC is a critical problem. Nearly 80 percent of all reported USAF incidents of GLC occur in the T-37, and unfortunately, it was the cause of the only Class A mishap in the last 2 years. During recent years, ATC has increased emphasis on G-awareness training and proper anti-G straining maneuvers. We need to continue this emphasis. Despite the mishap, ATC's G-awareness training is sound, and the T-37 is an excellent vehicle for this training.

Life Extension

With the cancellation of the T-46, it became necessary to extend the life of the T-37. The Air Staff considered several suggested plans for updating the aircraft, including such improvements as a pressurized cockpit, new engines, updated avionics, and improved ejection seats. However, since the aircraft is old and replacement is expected before too long, they decided to update only those critical structural components which are approaching their life limit.

Under the planned Structural Life Extension Program (SLEP), wing spars, along with main structural components in the empennage and horizontal stabilizer, will be repaired or replaced. This program will extend the airframe life well beyond any expected operational use of the aircraft.

The Challenge

The T-37 has been a stalwart performer for a long time, and with structural life extension, it will still have a lot of good years left. If you fly the T-37, you may not brag about it in the bar, but you know it's a great airplane for the job. You also know that when operated within the guidelines developed over 32 years of experience, it's also one of the safest and most reliable aircraft in the inventory. Let's make every effort to keep it that way. ■

T-38

MAJOR WALLACE COATES
Directorate of Aerospace Safety

■ For the past 27 years, the T-38 has been the premier aircraft for military pilot training. Today, the USAF operates a fleet of 849 T-38s, using it primarily in ATC for undergraduate pilot training, but also in TAC for lead-in fighter training and several other commands for various training and support functions. In FY88, USAF T-38s flew over 340,000 hours, among the highest totals in the USAF inventory.

Although it was designed in the mid to late 1950s, and first flew in 1959, the T-38 is still the hottest trainer in service. Its performance and smooth, responsive handling characteristics have earned it the reputation as the Air Force's sports car. Thousands of pilots from all over the world have flown this remarkable aircraft, and you would be hardpressed to find one who did not thoroughly enjoy his or her time in the "white rocket."

Mishap History

Since it became operational in 1961, the T-38 fleet has accumulated close to 9.8 million flying hours. During this time, there have been 178 Class A mishaps, which destroyed 170 aircraft, and resulted in 129 fatalities. Operational factors account for the majority (108) of these mishaps, 57 were logistic related, and the remaining 13 were classified as undetermined or miscellaneous. The lifetime Class A mishap rate for the aircraft is 1.8 per 100,000 hours of flying time.

FY88 Class A and B Mishaps

From a safety standpoint, FY88 was another successful year for the T-38. Data analysis gurus at AFISC had predicted four Class A mishaps for the year. We experienced only two, for a Class A mishap rate of 0.57. Nothing is quite so pleasing as proving the experts wrong. There was also one Class B mishap. The following is a summary of those mishaps:

■ The mishap aircraft was serving as safety chase for a QF-100 drone which was the target for a surface-to-air missile. Following destruction of the drone, the aircraft was orbiting the impact site when it entered an uncommanded left roll and pitched nose down. The pilot initiated ejection just before ground impact. He impacted the ground with an unopened parachute and was fatally injured. A photographer in the rear cockpit ejected successfully, sustaining minor injuries. The pilot's parachute failed to open because the ballistic side of the lap belt had been improperly assembled during an inspection. The belt separated in flight, prior to the ejection, negating the automatic parachute

continued

deployment feature.

■ As the flaps were lowered for landing at the conclusion of an uneventful training mission, the mishap aircraft violently pitched up. The pilot retracted the flaps, but was unable to regain adequate pitch control to accomplish a landing. He ejected successfully.

A failure in the flap/horizontal tail interconnect assembly prevented the pilot from regaining nose down pitch authority.

■ When the pilot of the mishap aircraft lowered the landing gear during an overhead pattern, the left main gear indicated unsafe. A chase ship confirmed that the left main was not fully extended. Alternate extension failed to result in a safe indication, and subsequent attempts at normal gear extension were also unsuccessful. The crew elected to retract the gear and accomplish a gear-up landing. The landing was successful, and the crew was uninjured. A retaining bolt had failed, allowing a pin to slip and jam the gear, preventing full extension.

Problem Areas

Engine failures, flameouts being the most common, account for the largest share of reportable incidents in the T-38. Several material and maintenance problems are factors in the high flameout rate, and SA-ALC is addressing these issues. Operations outside the engine envelope and pilot technique at high altitude are also factors which need continual emphasis. Failure of internal rotating components are more infrequent, but constitute a much more significant safety hazard. SA-ALC has implemented programs to replace first- and second-stage compressor blades and remove high time compressor and turbine disks from service. Hopefully, this will minimize catastrophic failures which have a high potential for causing a Class A mishap.

The physiological mishap rate for the T-38 is also very high. Worn canopy seals, pressurization regulator failures, and problems with the ducting have contributed to cockpit pressurization system failures. Improved maintenance practices and time change of the canopy and windscreen seals should help improve system reliability.

Fatigue cracking and failure of various components in the airframe structure and landing gear have resulted in several interesting high accident potential (HAP) reports during the past year. Age is definitely a key issue with the airplane. Inspection, identification, and replacement of these components is, and

will continue to be, an area of increasing importance for the remainder of the aircraft life.

System Modifications

The top logistic improvement program for the T-38 is Pacer Classic. This integral program of airframe, engine, and avionics updates is aimed at extending the life of the T-38 well into the 21st century. Two of the three major efforts under the program, replacement of magnesium flight control components and strengthening of the dorsal longeron, are currently in work. The remaining major effort, scheduled to begin in FY91, is work on cockpit enclosures.

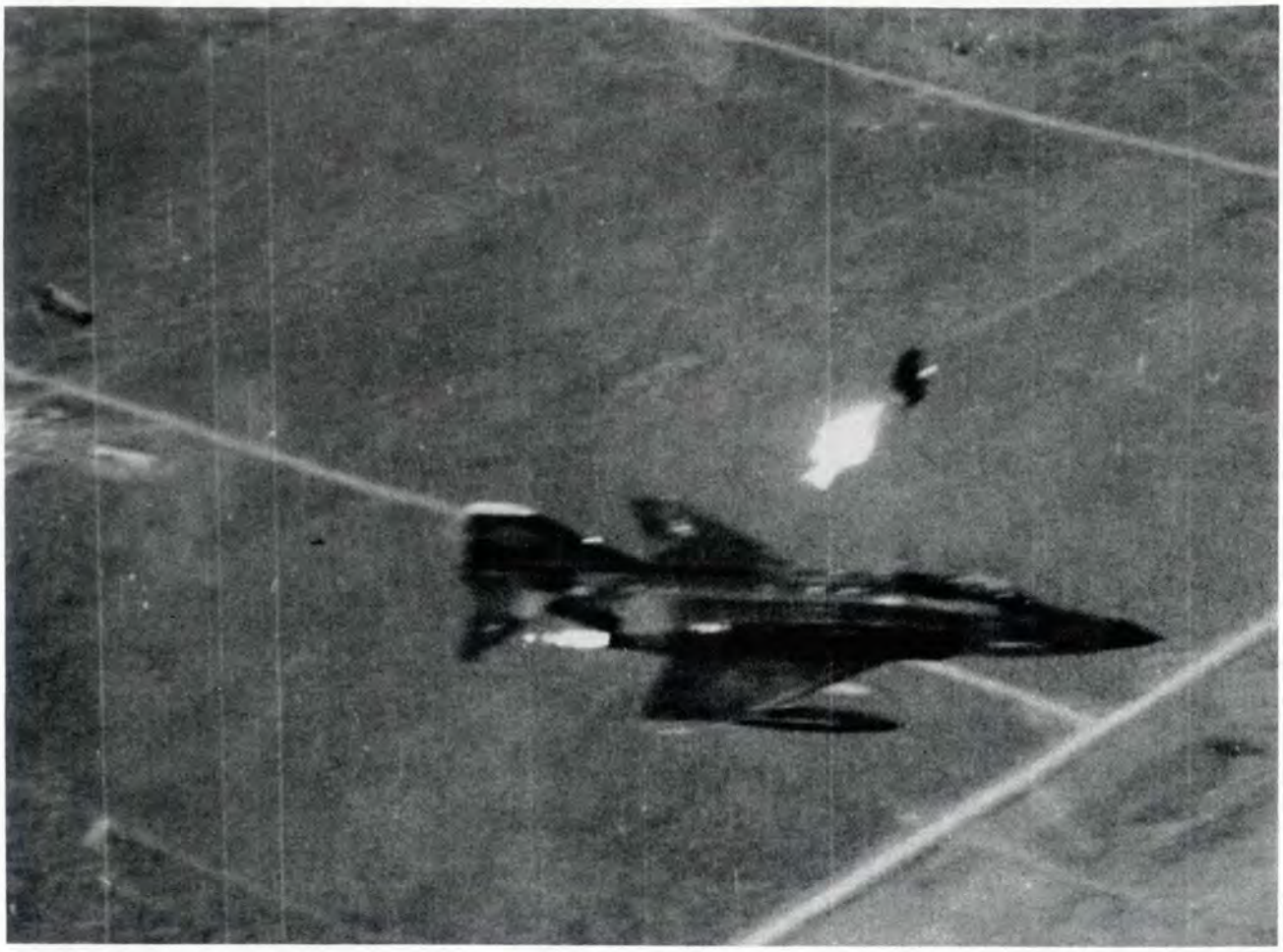
This includes new cockpit longerons, replacement of the cockpit floor, a new bird-proof windscreen and instructor windshield, an improved canopy latching mechanism, and a new windshield frame. A command sequenced ejection system and an antiskid braking system, all modifications previously planned under Pacer Classic, have been canceled.

FY89 Forecast

Data analysts at AFISC predict three T-38 Class A mishaps for FY89. Their figures, based on previous mishaps, show midair collision or a flight control malfunction to be the most likely cause. However, their analysis weighs recent mishaps more heavily than others. Over the 28-year history of the T-38, pilot-induced loss of control is by far the leading mishap type. Collision with the ground and takeoff and landing mishaps have also taken a significant number of lives and aircraft.

Consequently, we cannot just concentrate on preventing midairs and flight control problems in FY89. We need to stress safety in all aspects of operating and maintaining the aircraft. Particular emphasis should be placed on eliminating operator-caused mishaps. Operations mishaps outnumber those due to logistic factors nearly two to one.

FY88 was a successful year for the T-38. The Class A mishap rate, as it has been for almost the entire aircraft history, was well below the overall USAF rate. To prove the analysts wrong again, you need to continue to improve on the already remarkable safety record. Keep up the good work, and good luck in FY89! ■



FY88 USAF EJECTION SUMMARY

ROBERT CAMPBELL
Directorate of Aerospace Safety

■ During FY88, 54 aircraft with escape systems were involved in Class A mishaps. The mishaps involved 78 crewmembers who had the capability to eject: 13 failed to eject, 17 ground egressed with minimal injuries, and 48 made the decision to eject. There were 23 fatalities, 13 that did not eject, 6 ejected out of the envelope, 1 was lost at sea (after ejection), 1 midair collision (died after ejection), 1 inadvertent ejection, and 1 equipment failure.

Timely Escape Decision

■ The mishap aircraft was no. 2 in an F-16 BFM upgrade mission. During takeoff, the mishap pilot rotated at 133 knots and was airborne at approximately 148 knots. The pilot deselected afterburner (A/B) between 250-275 knots, 8 seconds after liftoff, at approximately 250 feet AGL. Concurrent with the deselection of A/B, the pilot felt and heard what he thought was a compressor stall. The pilot immediately tried to zoom the aircraft; however, the aircraft yawed to the right, started a slow right roll, and the nose started to fall. During the uncommanded yaw and roll, the fire engulfed most of the aircraft. The pilot, realizing he had no control over the aircraft, ejected 13 seconds after liftoff at approximately 200 feet AGL and 100 knots. The ejection was successful; however, a delay of 2 to 3 seconds would have been fatal. Well done!

Out-of-Envelope Ejections

■ The mishap aircraft was lead in an F-5, four-ship cross-country deployment. Engine start and end-of-runway checks were uneventful. Shortly after brake release, a plume of fire was seen trailing the aircraft. During the takeoff roll and at rotation, several transmissions were made warning the pilot he was on fire.

Approximately 7,000 feet down the runway and 130 feet in the air, an explosion blew off the right hydraulic access panel. One to 2 sec-

onds later, the mishap pilot transmitted for 5 seconds that he had a double engine fire and was bailing out. The ejection sequence was initiated 13 seconds later (3 to 4 seconds late), and the pilot was fatally injured by ground impact.

■ The mishap aircraft was no. 2 of an F-111 two-ship low-level navigation training and range work mission. Shortly after takeoff, tower people observed the main gear and nose gear retreat. Approximately 26 seconds after takeoff and as the aircraft climbed to 200 feet AGL, tower people observed the right canopy hatch fully open. Departure control notified the aircraft of the canopy opening; however, the crew never acknowledged the call, and no radio transmissions were heard from the aircraft. The aircraft proceeded on the departure heading at a maximum altitude of 300 feet AGL. Ground witnesses observed the aircraft begin a continuous descent, wing rock, and nose oscillations. The aircraft continued to descend and decelerate for another 10 to 12 seconds. At approximately 150 knots, 175 feet AGL, 132 degrees left bank and 24 degrees nose low, the instructor pilot (right seat) initiated the ejection sequence. The ejection sequence was interrupted by ground impact, and both crewmembers were fatally injured.

Out-of-the-envelope ejections and collision with the ground (no attempt to eject) are the leading causes of fatalities in escape system-equipped aircraft. During the period of 1 January 1983 to 30 September 1988, 154 crewmembers died because they did not use their escape system or they pulled the handle too late. See pie chart.

Fatality Causes

Table 1 shows the number of aircraft involved, number of ejections, and number of fatalities. Table 2 shows the survival and fatality rates for all crewmembers involved in Class A mishaps.

Escape systems are a passive part of the aircraft during normal operations. However, during an emergency, these systems can save your life. Think about it the next time you go flying. ■

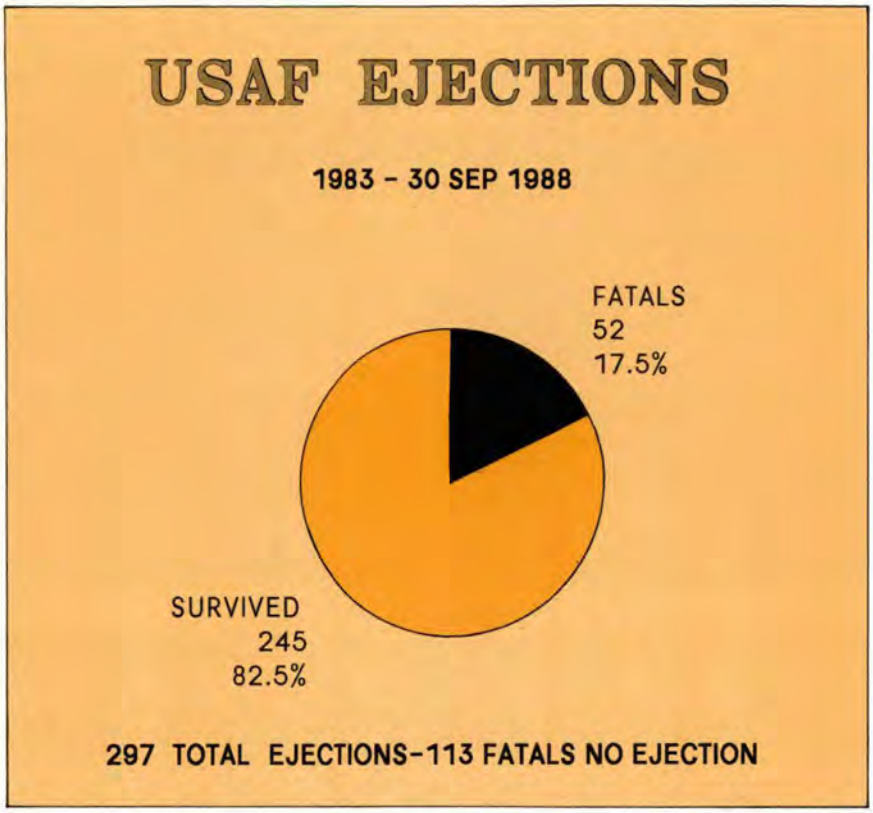


TABLE 1
Class A/B Mishaps
Ejections By Aircraft
FY 1988

Aircraft Type	Number of Aircraft	Ejected	Did Not Eject	Fatalities
OA/T-37	2	2	1	2
F-5	2	2	0	1
AT/T-38	2	3	0	1
A-10A	3	2	1	1
A-7	5	3	2	2
OV-10A	1	2	0	0
RF/F-4	8	10	6	5
F-15	2	2	0	0
F-16	25	17	9	6
F-111	3	4	2	4
B-52	2	1*	11	1
Totals	55	48	32**	23

* Inadvertent ejection
** Seventeen ground-egress with minor injuries

TABLE 2
Class A Mishaps
Overall Ejection Results
FY 1988

	Number	Percent
Ejected and Survived	38	48.7
Ejected and Fatal	10	12.8
No Ejection and Survived	17	21.8
No Ejection and Fatal	13	16.7
TOTAL	78	100

Properly washing and drying our Nomex garments ensure maximum protection. Appropriate care of this unique fabric is critical.

N-O-M-E-X Spells Protection

Our personal safety depends heavily on Nomex garments. We must do our part to ensure they are in top condition!

JIM CLARK
Senior Technical Specialist

■ Nomex is a trade name for the material developed by Du Pont used in the manufacture of protective clothing for aircrews. The fabric is made from high-temperature-resistant aromatic polyamide fibers with the generic name of ARAMID. The correct designation is NOMEX ARAMID fiber. The fire-resistant qualities of the fabric are not derived from a treatment applied to the cloth, but rather are the result of the molecular structure of the material itself that prevents it from melting.

Early Nomex

The early Nomex fabrics were made from continuous filament fibers — unending fibers which were woven into fabric used for anti-G suits, and other applications where strength, in addition to fire resistance, was an all-important factor. Such fabric, however, lacked the qualities needed for a soft and comfortable material to be used in garments worn every day.

Nomex Now

The continuous filament was replaced by short fibers which were chopped up and made into yarn in a process much the same as that employed on an old-fashioned spinning wheel. The material made from the resultant Nomex threads is not only highly resistant to fire and heat, but is resilient, lightweight, and comfortable to wear. It also retains the required strength.

The standard items of apparel made from this fabric are flight suit, jackets, shirts, trousers, and gloves. This flight gear should be reserved for actual flight operations and never worn for general maintenance activities. Grease, oil, petroleum fuels, and other dirt and grime will degrade the fire-resistant properties in the contaminated areas. Maximum protection requires that sleeves be worn down, cuffs fastened, bottoms of trouser legs fastened, and shirt tucked into trousers. Never wear synthetic underwear with Nomex. Synthetic underwear melts. Who wants a batch of melted underwear hung around his or her equator? Changing to clean underwear before each flight is strongly recommended. In the event of a mishap involving burns, soiled clothes can produce infection.

Nomex Care

Care, of the "tender, loving" variety, is the magic ingredient that will ensure maximum protection



Use of a fabric softener with Nomex material is a must! This will help reduce static electricity which can cause serious problems.

from your Nomex garments. The Number One preventive maintenance action for your Nomex clothing is to keep it clean. There is nothing magical about the cleaning process. Nomex can be drycleaned, hand washed, or run through the home automatic or a commercial-type unit. To obtain the best results, follow these simple instructions:

- Turn all pockets inside out; brush away dirt, gunk, bits of paper, threads, and any other assorted trash. (Retrieve any paper money for future use.)
- Use a water temperature of medium hot to hot.
- Add enough powder detergent to make plenty of suds.
- Wash clothes at least 5 minutes, rinse 4 to 5 minutes, and spin dry 1 to 2 minutes. Tumble dry, or hang in shade to drip dry.
- Use a commercial fabric softener. Stop the machine and add it before the last rinse cycle starts.
- Launder your Nomex as soon as possible after a fuel spill.
- NEVER use starch — it will BURN! And there go the fire-resistant properties. If some *nonpro* laundry type adds starch in the washing cycle, don't panic. Just run the Nomex through the rinse cycle a couple of times, dry it, and wear it with confidence.
- You can touch up Nomex with an iron, but never iron the hook and pile (Velcro) fasteners.

Some special tips apply to Nomex gloves. Wash and rinse them like you do Nomex shirts, trousers, and jackets. Drip dry or wrap them in a towel. Stretch them into shape. Never put gloves in the direct sun or use hot air to dry them.

Never wear Nomex gloves when working around your equipment where they can be soiled with grease and oil. They're supposed to be worn only when operating your aircraft. You may need a softening agent for the leather palms. Use neat's-foot oil or saddle soap. Don't be perturbed if the oil turns the leather darker.

Use of a fabric softener as recommended above, or during drying, is for a more subtle purpose than to make them soft and cuddly. The softener acts as a fabric lubricant and moisture retention agent. It won't destroy the fabric's fire resistance. You'll notice that the amount of static electricity is reduced, too. This is most important, and here's why.

Electrical Hazards

Your body conducts electricity all the time — even when you're walking and working. In a dry atmosphere, you can build up and hold a charge of several thousand volts ... like when you walk across a synthetic rug. Most of this electricity is drained away harmlessly as fast as it is generated — through your shoes into the ground or floor. But if you're working with fuel, it could be dangerous.

Natural fabrics, like cotton and wool, rubbing against man-made fabrics, like polyester, may generate static electricity.

For instance, when you take off Nomex clothing that is fuel soaked, your movements could cause a static electricity discharge that could set the clothing on fire.

If you do spill fuel on your Nomex clothing, move slowly away from the area. Get at least 50 feet clear of any fueling operation. Hose down your clothing before taking it off. If you can't soak your clothes with water, grab hold of some grounded bare metal with both hands. Hold on to it for a few seconds. This will equalize the electricity between you and the grounded object. Remove your clothes slowly and carefully.

A little skin irritation from the fuel won't kill you. The fire following a static discharge could!

FINAL ADMONITION — TAKE CARE OF YOUR NOMEX, AND IT WILL TAKE CARE OF YOU! ■

Reprinted from January 1979 *F-5 Digest.*

Who Said?

■ How many times have you been in one of those "gray" areas where the established rules and regulations didn't seem to fit? Or worse yet — the instructions you were given in one regulation seemed to conflict with the rules as laid out in another regulation?

Crewmembers are faced with a multitude of rules, regulations, written policies, unwritten policies, be no's*, WOMs*, and on and on ad nauseum. Some are permanent. Some are temporary. To add to the confusion, the sources of all these instructions are just as varied as the instructions themselves.

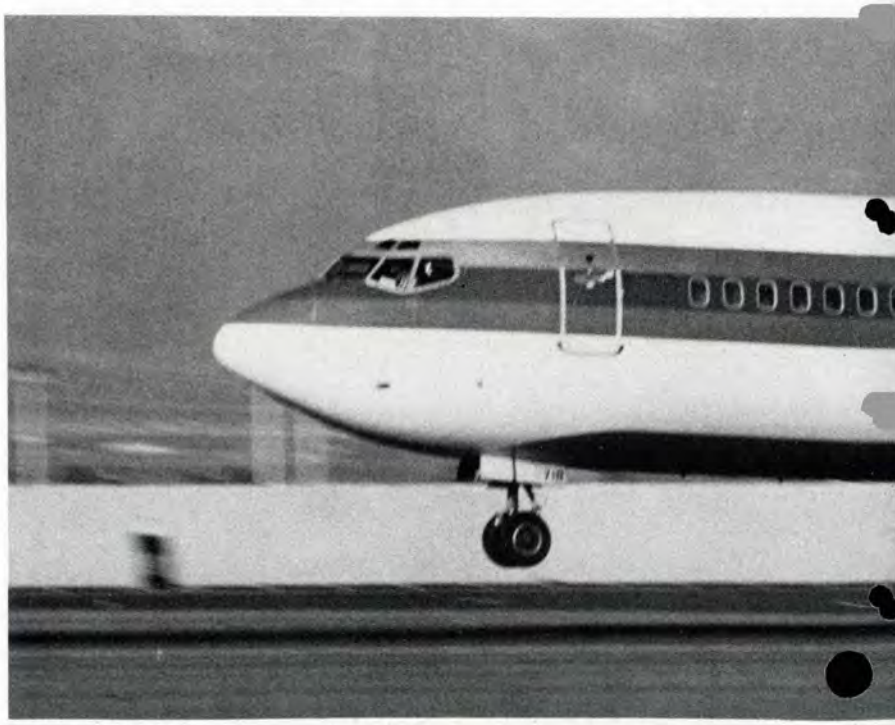
We have directives from Headquarters Air Force, MAJCOMs, intermediate commands such as air divisions or numbered air forces. Add to that the wing, base, squadron, flight, building caretaker, etc. — and that's just the Air Force.

We are also subject to Federal Aviation Regulations (FARs) of which there are many. If we fly outside the CONUS, we have to follow the various rules, regulations, and customs of the country we are operating in.

Just when you think you've got it all together, one of those gray areas seems to pop up. It's usually when you have an emergency, an unusual situation, or there are just too many things happening at once. In other words, those "human factors" the safety people (especially the doctors) like to look at. Some of the key words are task saturation, loss of situational awareness, and channelized attention.

The following story from *ASRS CALLBACK* describes how an airline captain found himself in one of those gray areas. It could just as easily have happened to an Air Force crew.

An FAA inspector of our acquaintance speculates that few flights take place from beginning to end without some violation of the FARs — so complex and extensive are the regulations governing the national airspace system — and so vulnerable are humans to error, mischance, and (occasionally) folly. It comes as no surprise that the FARs are much on the minds of reporters to the ASRS, who — inadvertently in most cases — have run afoul of the regs. Encouragingly, some of our respondents use their experiences as occasions for further self-examination and thought, particularly when it comes to those perplexing "gray" situations.



*For our nontechnical audience, an explanation may be in order. Be no's are any instructions that prohibit certain things such as, "There will *be no* late takeoffs!" WOMs are any verbal directions passed on by Word Of Mouth.

What's a Captain to Do?

The flight was a profile descent to a large airport, conducted in instrument meteorological conditions. Flight attendants had called the captain on the interphone and reported that a passenger was unconscious and receiving oxygen. They requested that medical personnel meet the flight.

The next call from Approach Control directed us to reduce speed further. I acknowledged the call, informed the controller of our passenger problem, and asked him to relay to ABC Tower that we would like to expedite to the gate after landing. Approach canceled our speed restriction, cleared us for the ILS left runway approach, and said speed at our discretion. During the approach, we called airport in sight, and we were cleared to land on the *right* runway. We expedited to the gate where an ambulance and medical team were waiting.

My crew departed ABC and flew to XYZ. Approaching XYZ, we received a message to call ABC Tower. The FAA representative wanted to know if I had been aware that ABC right runway was NOTAMed closed. I informed the FAA man that we were aware of the NOTAMs, and the tower had cleared us to land on the right runway. The FAA said the tower controller had just come back from vacation and momentarily forgot the right runway was closed for landings when Approach Control handed our flight over.

I advised that the landing clearance did not seem unusual given the circumstances — Approach allowing us to speed up, Tower being advised of our ill passenger and request to expedite to the gate. The FAA asked if I knew how high I was as I passed over the construction off the approach end of the right runway. I did not know, but estimated touching down about 3,000 feet down the runway after seeing construction during the approach.

If you approach a red light while driving, with a police officer waving you through the intersection, do you stop for the red light or proceed as directed? Given similar circumstances in the future, I will try to remember to question the controller.

The key is to be prepared by knowing as much as possible about the applicable rules and regulations, your aircraft, yourself, and your crew, if you have one. Plan ahead, and try to anticipate events to avoid falling into some of those human factors traps. Practice good crew coordination, or get assistance from the SOF, your wingman, controllers, etc. Above all, as the captain suggests, don't be afraid to question unexpected directions. ■

MAIL CALL

"REMEMBERING THE KOREAN WAR"

■ Much enjoyed your article, "Remembering the Korean War," in *Flying Safety* magazine for July 1988, especially the section, pages 20-21, discussing the gallant activities of "Task Force Smith."

An old friend, Brad Smith, then a Lt Colonel (Charles B. Smith), was the commander of the task force bearing his name and survived the Korean conflict. You might be interested in learning that Brad Smith not only was on the immediate scene at the start of the Korean War, but also was on Oahu that infamous day of December 7, 1941, when the Japanese struck to launch World War II for the US of A.

Our hero retired as a Brigadier General, US Army, in the '60s and has been employed in a senior position with a firm in the Phoenix, Arizona locale. He and wife Bette live in Scottsdale, Arizona.

Back in the '50s, our youngsters were in the Boy Scouts together while we both were serving in NATO's Headquarters, Allied Forces Southern Europe (HQ AFSOUTH) in Naples, Italy. I was talked into pulling the role of Chief of the Boy Scouts in Southern Europe, and at one time tried to coax Brad into chaperoning an overnight hike of the troop. He quickly replied that he had spent enough time living on the ground in two wars, etc., and planned to live civilized, henceforth — no foxholes. Makes sense, right? He is a very good guy, as is his wife.

Just to let you know . . .

Col Storm C. Rhode, Jr., USAF Ret.

Thanks for giving us the additional information. We're glad you enjoyed the article.

After seeing firsthand some of the war memorials during his visit to Korea, our staff author was truly inspired to recount two significant battles. ■

THERE I WAS

continued from inside front cover

speed on a previous flight. The closing writeup was "ops checked out normal."

■ I'd gone out and had fun (nothing wrong with that), but had gotten a little carried away (unprofessional is probably a better word) by not doing a nice, normal, controlled straight-in.

■ I'd failed to go around (after all, this *was* an ORI and how would *that* look?) when I was at least 30 knots fast over the threshold.

■ When things started to go wrong, or at least I started to recognize how wrong they were, I trapped myself into believing it was only my own recklessness that caused the situation. While certainly a MAJOR factor, I'm sure the mishap report would have said a word or two about the antiskid malfunction. Once I was locked onto how stupid I was for causing this *on my own*, I never even thought of the possibility of a system failure. Luckily, some small germ of all those sims I've taken (and given) remained, and at the last second, I remembered the right procedure.

Two last points. Why did I delay putting the hook down (I still don't have an answer for that one), and where was the back seater during all of this? In my case, he was happily calling out speeds and runway remaining, seemingly without a care in the world! He never did ask me what was going on, or mention this event to me (out of either loathing or ignorance of how close we came to a major mishap that day, I do not know). He was a good WSO, too.

Major lesson learned — if you put yourself in a bad situation, don't stay there (I could have gone around). Even better, don't put yourself into bad situations for dumb reasons. And when things *do* go bad, don't keep kicking yourself in the butt for screwing up. Dig yourself out of the hole by using standard procedures, just like we practice in the sim! ■

Too Mar

LT COL JIMMIE D. MARTIN
Editor

■ The C-141 aircrew was scheduled to fly three local proficiency sorties. The crew included four pilots: One instructor pilot (IP), two aircraft commanders (AC), and one first pilot (FP). For takeoff, one AC was in the pilot's seat, the IP was in the copilot's position, the FP was in the jump seat, and the remaining AC sat in the navigator's seat facing forward.

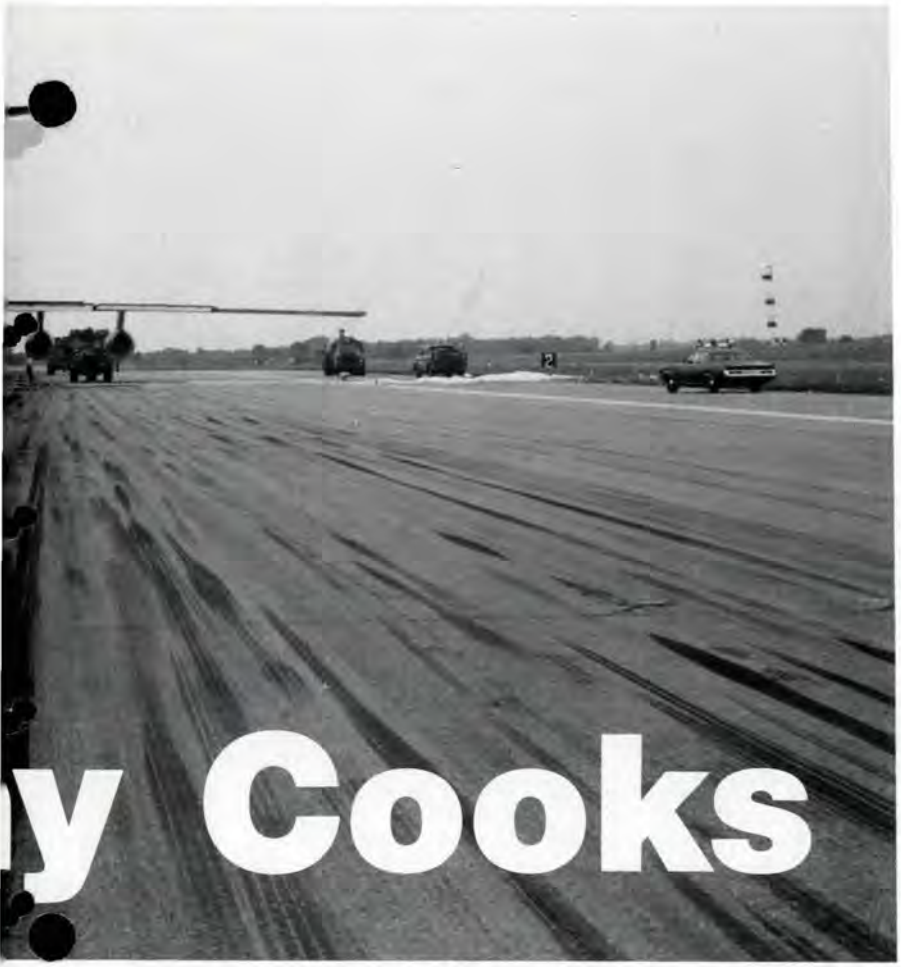
The aircraft was cleared for a rolling takeoff, and the pilot made a right turn onto the runway and advanced power. The aircraft began to drift to the right of center line, and the pilot used left rudder pedal steering to correct it. As the aircraft continued to drift right, the pilot used left nosewheel steering for more authority.

Unknown to the crew, the left nose tire was scuffing at this time, and the right nose tire was leaving heavy rubber marks. Before the aircraft reached the 1,000-foot runway marker, the tower reported smoke coming from the nosewheel well area.

Just as the aircraft began to correct left to runway center line, the IP said "Reject" and applied right rudder. The pilot was unaware of the IP's inputs since the IP had not taken control of the aircraft. So, the pilot continued to apply left nosewheel steering.

As the throttles were placed in reverse idle and the spoilers deployed, the aircraft weight shifted to the nosewheel tires and the steering became much more effective. The nosewheels were almost fully deflected to the left, and the aircraft made an abrupt turn and headed for the left edge of the runway.

The IP applied full braking but was unable to stop the aircraft before it departed the left side of the runway. The aircraft came to a stop on the grass beside the runway.



There was no damage, and the crew egressed without injury.

Examination of skid marks on the runway showed the pilot started the takeoff roll with the nose tires pointed to the right. He then overcorrected to the left. The IP tried to rectify the situation, but didn't take control. As a result, two pilots were trying to fly the aircraft at the same time with opposite ideas of what needed to be done.

There is no reason for two pilots to be fighting for control of any aircraft. Don't try to help a pilot by making control inputs. If you don't like what's happening, take control. But, make sure you always have a positive transfer of control so there is no question about who's doing the flying.

A crew is a group of people who function as a whole. Crew coordination requires one person to be in charge. That person must communicate his or her intentions to the rest of the crew. There must be no doubt about who is in charge and what is expected of each individual.

Reaching this level of understanding requires detailed preflight briefings and a lot of talking during the flight. This is especially important when flying with people who aren't part of a regular crew that you fly with every day.

Despite our best efforts to standardize everyone, there will still be differences in techniques and understanding of various concepts. Unless the aircraft commander clarifies his or her expectations, each person will function according to the way they usually do things.

This is especially true during emergencies or unusual situations — just when the AC may need the help and have little or no time to brief other crewmembers on what to do. It's too late for that.

Remember, a group of fliers in an aircraft without a positive leader and a clear plan of action is not a crew — it's a crowd. ■

FSO's CORNER

Aircraft Mishap Worksheet

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

■ Some time ago, I was told by the MAC/IG FSO about some good ideas to be had at Rhein Main AB. I wrote them a letter and received an information package from the Director of Safety at the 435th Tactical Airlift Wing. Among other things, the package included a mishap worksheet for C-130 aircraft.

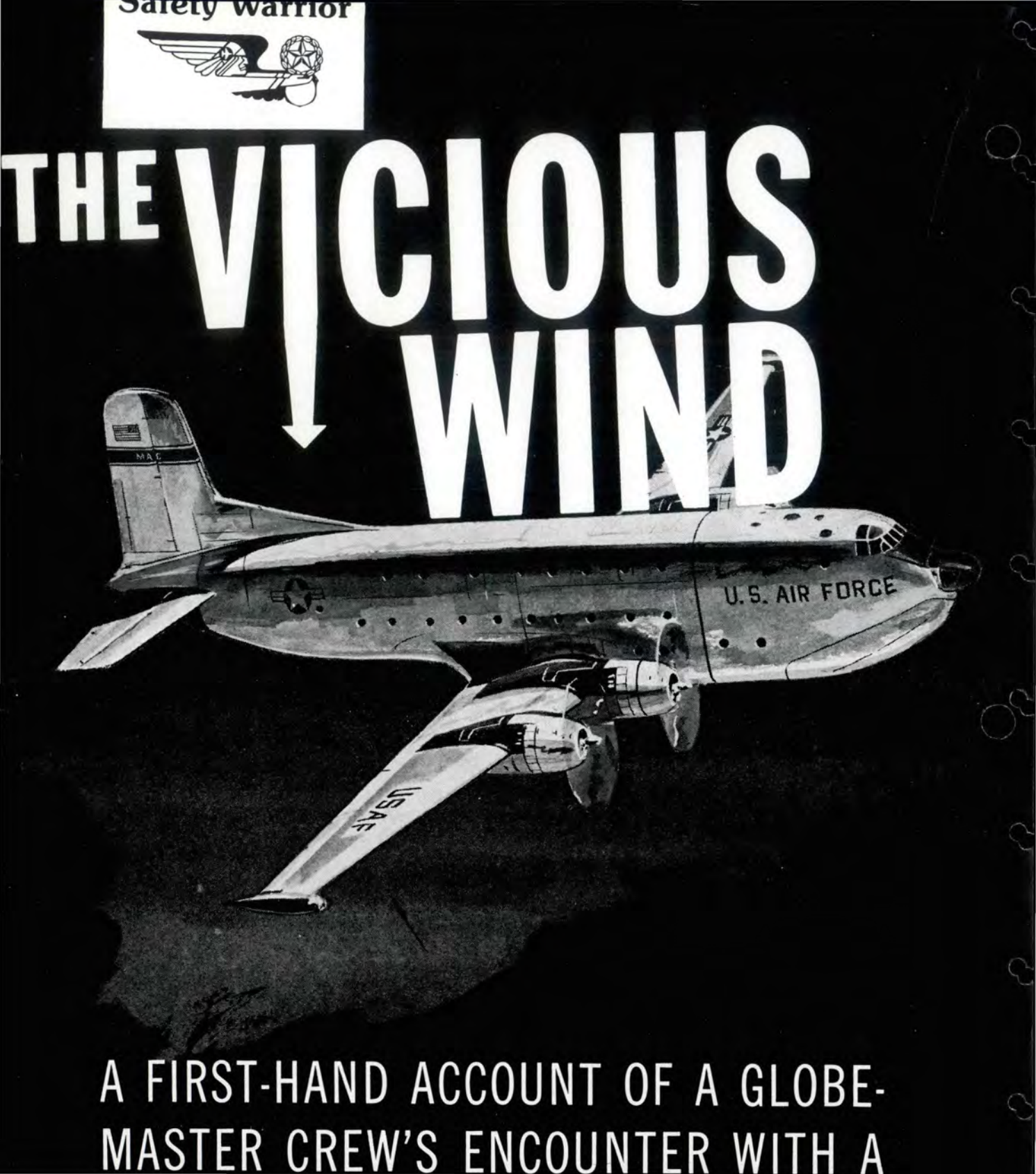
The C-130 Mishap Worksheet was 13 pages long and included systematic coverage of all switches, controls, and indicators on the basic C-130. The worksheet would provide any mishap investigator with an invaluable tool for both preserving the evidence and ensuring that nothing covered on the worksheet gets left out, at least not without knowing about it.

I asked a couple of my additional duty FSOs to apply the idea to the AC-130A and received a 38-page document that will provide an extremely valuable tool should the need arise. We have ours on a "floppy" to make it easy to keep it current with aircraft mods.

The Rhein Main C-130 Mishap Worksheet was designed by Captain Paul A. Schwarmann when he was assigned there. He's now flying C-130Es with the 327th Tactical Airlift Squadron at Willow Grove ARF, Pennsylvania. I'll provide copies of the Rhein Main C-130 Mishap Worksheet upon request to the address above, or call TAWC on AUTOVON 872-2012. ■

Safety Warrior

THE VICIOUS WIND



A FIRST-HAND ACCOUNT OF A GLOBE-MASTER CREW'S ENCOUNTER WITH A

CAPTAIN SHERMAN R. McKINNEY

■ December 13, 1967, was not a Friday, but it was a day a MAC reserve crew* will remember all their lives. They looked disaster in the eye, straight-armed it, and survived 5 minutes of terrifying, adrenaline-pumping hell.

The Dobbins AFB crew was flying a scheduled MAC cargo mission in a C-124 from Athinai Airport, Greece, to Rhein Main, Germany. They had experienced several difficulties with the aircraft on previous legs of the trip, the most notable being an autopilot which was unreliable at times, and an erratic pitot static system. The airspeed had fluctuated from 150 knots to 210 knots without any pitch or power changes on the flight into Athinai. Maintenance made some minor corrections and signed these items off as corrected.

The crew performed the normal pre-departure duties uneventfully. Flight planning, buffer zone, route, and departure briefings were thorough; however, the weather briefing was not adequate. A weather forecaster was not on duty at Athinai, and the briefing was by telephone. Weather charts were not prepared and issued to the crew.

A cold front was forecast to be located across their line of flight curving NE to SW through Brindisi, Italy. A weather warning area covering the western edge of Italy, the Mediterranean Sea, and continental Europe which contained isolated thunderstorms and high ground winds was also mentioned.

After the engines were started and just prior to taxiing, Athinai Airlift Command Post advised us to switch radios to the pilot-to-forecaster channel. When we did so, someone at the weather station advised us that there was a possibility of moderate turbulence and mountain wave effect within the local area up to 14,000 feet.

We made a normal takeoff at 2220Z. Manning the crew positions for this flight were Capt T.M. Shanahan, pilot; Capt S.R. McKinney, copilot; Lt Col J.A. Williams, navigator; TSgt J. Knight, panel engineer; SSgt W.J. Green, scanner; and SSgt S.J. Van Meter, loadmaster on duty. The aircraft was computed to be at the maximum gross weight of 185,000 pounds.

Our ATC clearance was to cross the Korinthos radio beacon (located 40 NM west of Athinai Airport) at or above 8,000 feet, and to climb and maintain 10,000 feet. We crossed Korinthos at 2239Z at 10,000 feet.

The Doors of Hell

Exactly 10 minutes later at 2249Z, the doors of Hell started to open. We were over the northern part of the Greek island of Peloponnesus. Our cruise airspeed was 175 to 180 KIAS and the autopilot was engaged, including altitude hold. We had not encountered any turbulence or other adverse weather conditions to this point. Sgt Knight called the decreasing airspeed to the attention of the pilots between 165 and 160 KIAS.

Capt Shanahan, who was reviewing the pilot's flight plan log at the moment, immediately took over the controls and disengaged the autopilot. The loose papers in his lap floated up and hung in midair at about eye level for a couple of seconds. Within this momentary period of time, the airspeed had decreased to approximately 135 knots. Capt Shanahan immediately lowered the nose and called for climb power which Sgt Knight had already begun to apply.

The aircraft entered a cirrus or lenticular-looking cloud formation at this time and extreme turbulence began. Capt Shanahan directed me to assist him on the controls, which was necessary to keep the aircraft in an upright position.

Capt Shanahan asked for METO (military except for takeoff) power immediately after climb power was set. With this power setting and an airspeed now of about 145 knots, with a 2-degree nose high attitude, the altimeter was unwinding rapidly, and the vertical velocity indicator was showing a descent of approximately 2,500 feet per minute.

Capt Shanahan called for maximum power. During the fall, the right wing dropped about 25 degrees, but we brought it back to level. However, control was sluggish, and it appeared that the ailerons were almost stalled. The descent finally slowed and was broken at an indicated altitude of about 8,000 feet. The height of the tallest mountain peak in our general vicinity was 7,796 feet.

Meanwhile, In The Back

Action in the cargo compartment was also quite spectacular. The cargo consisted of a telephone pole line truck full of miscellaneous equipment with a total combined weight of 23,230 pounds. (Space Control at Athinai had listed the weight as 22,500 pounds, so the aircraft took off 730 pounds overweight.)

Suddenly, all of the tiedown chains attached to the truck were straining in a quivering tension. A moment later, the chains were full of slack and actually laid down on the floor. Next, the chains on the left side were taut and straining while the right chains were still slack as the truck tried to turn over sideways. This undoubtedly occurred when the right wing dropped during the rapid descent. When the chains laid down on the floor, the loadmasters attempted to get out of their seats to tighten the existing chains and attach additional chains to the truck. But they were unable to do so because of the extreme positive G forces.

continued

*Members of the crew were Capt T.M. Shanahan, aircraft commander, who was taking his initial A/C line check; Maj R.C. Silby, pilot flight examiner; Capt S.R. McKinney, first pilot; Lt Col O.K. Armstrong, second pilot; Capt C.D. Hawkins, navigator flight examiner; Lt Col J. A. Williams, navigator; Lt Col B.J. Antonio, navigator; Maj B.E. DeMars, navigator; TSgt J. Knight, instructor flight engineer; TSgt R.J. Logue, flight engineer; SSgt W.J. Green, flight engineer; TSgt J.E. Newberry, loadmaster flight examiner; SSgt S.J. Van Meter, loadmaster; A1C T.H. Burks, loadmaster; and A3C R.K. O'Hara, loadmaster. All were members of the Reserve 918 Military Airlift Group, 700th MAS.

Recovery

We will never know by what height the airplane cleared the mountains since the altimeters were set at 29.92, and the local altimeter setting, especially in these erratic conditions, was not known. Also, no outside visual reference was possible, since in addition to being in the roll cloud most of the time, it was night and very, very dark.

Within seconds after the descent was broken, the aircraft began a very sharp rate of climb. We held an attitude which would normally be straight and level flight and reduced the power to METO and then to climb power. Under these conditions, the aircraft ascended back to 10,000 feet, with the vertical velocity indicator showing a climb of 4,000 feet per minute during a good part of this ascent.

After again reaching cruise altitude of 10,000 feet, Capt Shanahan asked me to get a clearance to climb to 12,000 feet. Athens Control cleared us to do this, with instructions to "report leaving 10,000 and reaching 12,000."

Not Again!

I acknowledged the clearance and reported leaving 10,000 feet at 2243Z but alas, we encountered a second wave at this same time and left 10,000 feet on the way *down* instead of up. The aircraft and instruments reacted the same way, but we lost about 600 to 700 feet of altitude this time. Several minutes passed before we were able to attain and report reaching 12,000 feet.

We encountered a third wave over the Greek Island of Kefallinia at 12,000 feet. We lost only 300 to 400 feet of altitude during this one.

Unusual Indications

In addition to the flight instruments indicating conditions which were completely backward to normal flight (whereas, by adding pow-

er and lowering the nose, the airspeed would still decrease and vice versa), we noted two other phenomena during these encounters.

Just prior to and during each one, the radar became blurred and spoked in a saw-toothed pattern. After emerging from the wave effect, the radar would return to normal each time. Due to the uncertainty of the accuracy of the airspeed indicators because of the previous trouble, Sgt Knight, at the suggestion of TSgt R.J. Logue, set the propellers in the "fixed pitch" position during the latter wave encounters.

He reasoned that with the propellers fixed, any change in airspeed would normally be reflected immediately by a corresponding increase or decrease in RPM. It didn't happen that way. Even though the airspeed would start to decrease rapidly, the propeller RPM would remain constant.

Crew Actions

During the first mountain wave encounter, all the crewmembers sprang into action and performed exceptionally well. Sgt Knight was very alert at operating the panel and stayed well ahead of the anticipated engine power requirements with cool professionalism. Lt Col Williams determined and recorded the position of the aircraft during these hectic moments. Maj R.C. Silby came forward to the cockpit and emphasized "attitude, attitude" over the interphone, realizing Capt Shanahan was doing all that could be done. Sgt Logue was in the crew compartment and immediately distributed life preservers and had everyone don one except the pilots, who were too busy.

Capt Shanahan did an outstanding job of controlling the aircraft and coordinating the crew during these grim encounters. In a very calm voice, without a trace of panic, he directed the engineer to set the necessary power; the copilot to help on the controls; the navigator to record the position; and the people in the cargo compartment to strap in their seats.

During all this time, he was fighting the controls to maintain a proper aircraft attitude in violent turbulence and erratic conditions. Had this job been performed in any less of a professional manner, there might have been a fatal crash in the mountains of Greece, cause unknown.

Additional Factors

Three other factors, had they been any different, could have caused the same disastrous results. Before startup at Athinai, Sgt Logue remarked to one of the loadmasters in regard to the truck, "That's the kind of load that can kill you because you can't get rid of it." The truck had been secured with the required number of chains, but after this statement, eight additional chains were added. This was probably what prevented the truck from tearing loose and breaking up the back of the airplane.

During climb out, the pilots anticipated that we couldn't reach 8,000 feet prior to the Korinthos radio beacon. At Sgt Knight's suggestion, we used METO power and made it to 10,000 feet by the time we reached Korinthos. Had the aircraft been at any lower flight level when we encountered the mountain wave, there may not have been enough altitude left to recover.

Our position during the first encounter was 4 miles right of course. The 7,796-foot mountain was located perpendicular to our line of flight at this position and 6 miles left of course. Had our position been farther to the left, it is likely that a stronger wave action over the taller peaks, plus less clearance, would have prevented a recovery.

Anticlimax

The rest of the trip, after the three mountain wave encounters, did not contain quite as many thrills of such harsh magnitude. A heavy load of rime ice built up on the aircraft as we flew along the western edge of Italy even though all anti-icing heaters were on. The ice finally dissipated later on when we got out of the clouds and into clear air. Some more mountain wave effects of lesser exuberance were encountered over the southern part of France near Marseilles. We had to use METO power to maintain altitude during these actions.

We had one passenger on this trip, a sailor who was on emergency leave. He went to sleep shortly after takeoff and slept most of the way. He did partially wake up during the violent turbulence, but must not have thought it was too unusual. Upon landing at Rhein Main, one of the crew asked him how he liked the trip, to which he replied, "Just fine, except it was a little bit cold." He will never know how close he came to meeting his destiny that night. ■

Adapted from *Aerospace Safety*, April 1967.

OPS TOPICS

One Good Secret Deserves Another

■ On the day prior to a flight, a navigator suffered minor chest pains. The pains subsided, so he decided he was OK.

The flight the next day was normal until the recovery. Descending through 18,000 feet, the navigator complained of a minor chest pain. By 10,000 feet, the pain had intensified enough that the navigator asked the pilot to full stop on the first approach.

At 5 miles on final, the navigator had to lie down due to the severe pain. The pilot didn't declare an emergency because the flight surgeon and an ambulance were already on the flight line in response to another emergency.

After landing, the pilot taxied to parking and then called for medical assistance. The flight surgeon placed the navigator on oxygen and transported him to the hospital. He was treated for pericarditis (a swelling of the tissue around the heart) and released from the hospital 2 days later.

The lessons? Don't self-diagnose. Use the flight surgeon. Declare your emergencies — even seconds can count. Be sure you get the help you need when you need it.

Fill 'er Up!

As no. 2 of an A-7 four ship was refueling at night, the leader noticed fuel flowing aft from the area of the refueling receptacle. A quick check with no. 2 and the boomer revealed neither was having any problems. The refueling continued with nos. 3 and 4 experiencing the same leak.

Approximately 40 minutes after refueling, no. 4 declared an in-flight emergency for an automatic flight control system (AFCS) malfunction. After landing, they found all four A-7s had 1 to 2 gallons of JP-4 in their avionics bays and elsewhere inside the aircraft. No. 4's AFCS computer had been shorted out by the JP-4.

All sorts of interesting possibilities come to mind with fuel loose inside the aircraft. The next time you say, "Fill 'er up," be sure you know where all that fuel is going. A small amount of spray may be acceptable, but don't continue if fuel is flowing across the aircraft or if there is excess spray.

Which Fire Light?

During a KC-135 preflight, the crew was checking the fire warning lights. The no. 2 engine fire warning light would not illuminate when the fire test switch was activated. However, the bulb would press to test normally, which indicated a faulty loop in the fire monitoring system.

The electric shop people checked the no. 2 engine and found no loose or separated wires. When they shorted a wire in the engine to see if the light would come on, the *no. 1* engine fire warning light came on. They checked the no. 1 engine, found a broken wire, shorted it, and the *no. 2* engine fire warning light illuminated.

As near as could be determined, the fire detection circuit wires had been crossed at the warning lights 19 months earlier. In all that time, no one found the error. I'm sure you can envision all kinds of horror stories that could have resulted from this mixup. ■

MAINTENANCE MATTERS

A HIGHER PRIORITY

■ While in the chocks with the engine running, the fighter pilot was cross-checking the engine nozzle position with his crew chief via the ground intercom. The first check showed a difference between the cockpit indicator and the actual position of the nozzle. In cycling the throttle for a second reading, a long flame plumed out of the tailpipe, and the engine stagnated. The pilot shut the engine down and air-motored it in accordance with emergency procedures.

What caused all this to happen? The aircraft had just gone through a phase inspection that included rigging of the engine nozzles.

The problem was that several individuals from the engine shop had worked on this phase at different times. Each time, they would start their inspection and maintenance, and then be pulled off the aircraft and sent to higher priority work.

One person had rigged the nozzles and did it incorrectly. He was being trained to do the task, but was left alone when his trainer was pulled off the job.

The lesson here is obvious. Although workload priorities are constantly changing, we need to be aware of the impact of pulling people off jobs already started. And don't forget to provide our trainees with proper supervision. Allow enough time to see the task through completion and ensure safety techniques and procedures have been followed.

LOOSE STICK

While in chocks preparing for a functional check flight, the pilot pulled back on the control stick of his trainer jet and felt a "give." Needless to say, he aborted the aircraft.

Investigation revealed that two of the three bolts that secure the control stick to the stick control box had pulled out of the heli-coils. Reason? The bolts were shorter than what the tech order calls for. In addition, one bolt had a washer installed when it should not have been, making it even shorter!

A one-time inspection of all local aircraft revealed a variety of incorrect attachment hardware, including various sized bolts, incorrect clamps, and missing or extra washers.

Fortunately, the loose stick revealed its presence *before* the aircraft became airborne. Otherwise, it could easily have caused a major mishap.

Remember that, in the end, it is attention to detail that makes the difference. In this case, that attention to detail consists of installing the correct hardware. And while we're at it, don't forget the importance of applying correct torque values when called for.

In the business of properly maintaining our aircraft and support equipment, it's the little things that count. Make the use of proper hardware a matter of special concern at your next rollcall.

THE LITTLE THINGS

A supervisor asked two 5-levels to remove and replace an aircraft component. He did not realize the two weren't task-certified, and he didn't ask them. Since both individuals had performed the task before, they felt confident to do it again.

When the required engine access covers were not at the aircraft, the supervisor went to get them while the workers began the task. He returned to the aircraft, installed the covers, remained for awhile, then left to check on another jet.

Meanwhile, the two workers removed the component and then left to pick up the replacement part. When the two 5-levels returned to the aircraft, they met a third worker.

Worker no. 3 installed the most difficult 3 of the 12 component mount bolts. Then, after informing the two 5-levels that one of the required bolts was missing, he left the area.

The two individuals searched the ground and the aircraft but couldn't find the bolt, so one of them obtained a new bolt from bench stock and installed the remaining hardware on the aircraft.

When the supervisor returned, neither worker mentioned the missing bolt. The jet was towed to the hush house where all the aircraft covers were removed.

After engine start, sparks came out of the aft end. Foreign object damage to the engine from the ingested "missing" bolt cost $27,000.

Sometimes there is nothing "little" about the little things. ■

We Have A Winner!!

Once again, we are truly amazed and dumbfounded at the depth of dumb humor out there. You people are fantastic. Our mailman is complaining about the extra load you're placing on him. We're continuing to have an added contest to select who will be on the panel of dumb humor experts. We have more than we can possibly use. The whole thing is dumb, but we love it and apparently you do, too.

It was a struggle, and the competition was tough but we finally picked the big winner (see below). Congratulations Sergeant Schulte! Your cheap little prize is in the mail.

In addition, our panel of dumb (humor) experts are demanding that their other choices be printed as honorable mentions, so we've included the top 10 runners-up. So keep up the great work, and send us those cards and letters with your entries to this month's contest. (See back cover.) We have a lifetime supply of cheap little prizes.

. . . AND THE WINNER
FOR THE DECEMBER 1988
DUMB CAPTION CONTEST IS:

SMSgt Patrick Schulte

New Castle, Delaware

HONORABLE MENTIONS

1. **Left, right, left! . . . Get in step or you'll do another 2 miles until you learn not to wear a cover on the flight line!!**
   Chris Zech, Naval Air Development Center, Warminster, Pennsylvania

2. **"Put your left foot in and shake it all about. Put your head in the nose cone . . . that's what it's all about." Boy I love those MWR programs!**
   Captain Ronald D. Fuchs, Deputy Director and Chief, Media Relations, Los Angeles, California

3. **Hey people! How long does it take for this solar shower to heat up?**
   Elaine S. Gilbert, 3246 TESTW/TZWA, Eglin AFB, Florida

4. **If they ever turn the ramp lights on, I'll be able to find that radome I lost.**
   SSgt Kenneth W. Kozeluh, 126 CAMS, Illinois ANG, O'Hare ARFF, Illinois

5. **Roger mission control, I'm ready for the countdown!**
   Doris L. Allsopp, 832 Civil Engineering Squadron, Customer Account Representative, Luke AFB, Arizona

6. **Heck of a place to put a pay-phone!**
   Matt Sprague, R&D Program Manager, Air Force Coordinating Office for Logistics Research, Wright-Patterson AFB, Ohio

7. **I'm melting! I'm melting!**
   Tina Stuard, AFALC/ERL, Wright-Patterson AFB, Ohio

8. **Seventeen years in this man's Air Force, and I've NEVER before seen a relief tube for the Jolly Green Giant.**
   MSgt Dean G. Hoffman, 1550 Technical Training Squadron, Kirtland AFB, New Mexico

9. **97, 98, 99, 100. Ready or not, here I come.**
   This entry was sent in by two people: SSgt Henry R. Harlow, 907 CAMS, Rickenbacker ANGB, Ohio, and TSgt Danny L. Blue, 366 TFW, Mountain Home AFB, Idaho

10. **I was told that single quarters were small, but this!**
    SMSgt Sonny Thornsberry, Superintendent FTD 320, Eglin AFB, Florida

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READER POLL

Flying Safety is published for aircrews, maintenance people, their commanders and supervisors, and support people in such fields as operations, air traffic control, and life support.

If you are assigned in one of these career fields, *Flying Safety* is for you. We would like you to tell us how we are doing so we can publish a magazine that best meets your needs. Please take a few minutes to complete the attached pre-addressed survey.

We also welcome letters and articles for publication. Please write to:

EDITOR, *Flying Safety* Magazine
AFISC/SEPP
Norton AFB, CA 92409-7001

The following information about this poll is provided in accordance with paragraph 10, AFR 12-35, Air Force Privacy Act Program: **Authority:** 10 USC 8012, Secretary of the Air Force; Powers and duties; delegation by; **Principal Use:** To collect a sampling of opinions on *Flying Safety* magazine. **Routine Use:** To present resulting grouped data for decision makers to evaluate the effectiveness of the magazine. Your participation is voluntary, but we need and will appreciate your honest responses.

Thank you for participating in this poll.

QUESTIONS

1. How often do you see the monthly *Flying Safety* magazine?
   - ☐ A. Every issue
   - ☐ B. Most issues
   - ☐ C. Some issues

2. When you see *Flying Safety* magazine, how much of it do you read?
   - ☐ A. All of it
   - ☐ B. Most of it
   - ☐ C. Some of it
   - ☐ D. Never read it

3. Are the articles interesting to you?
   - ☐ A. Always
   - ☐ B. Often
   - ☐ C. Sometimes
   - ☐ D. Seldom
   - ☐ E. Never

4. Are the articles of value to you?
   - ☐ A. Always
   - ☐ B. Often
   - ☐ C. Sometimes
   - ☐ D. Seldom
   - ☐ E. Never

5. Are you currently an aircrew member? Yes ☐ No ☐

   If yes, what position? _____

   If no, what is your job? _____

6. What is your rank? _____

7. What is your AFSC? _____

8. What is your MAJCOM? _____

9. What type of subject matter do you prefer to see in this magazine? _____

10. What is your favorite regular feature? _____

11. Please tell us how you would improve *Flying Safety?*

FOLD FOLD

Air Force Inspection and
Safety Center (SEPP)
Norton AFB, CA 92409-7001

Editor
***Flying Safety* Magazine**
AFISC/SEPP
Norton AFB, CA 92409-7001

NOTE:
Return through base distribution or base information transfer system (BITS)

FOLD FOLD

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.

MAJOR
Larry Brown

MAJOR
Keith E. Carter

1st Strategic Reconnaissance Squadron
Beale Air Force Base, California

■ On 20 October 1987, Majors Brown and Carter were flying an SR-71 operational reconnaissance mission. During rendezvous with a KC-135 for refueling, at night, their aircraft experienced a right generator failure. Unable to reset the generator, the crew directed the tanker to accompany them while proceeding to an emergency airfield. Shortly after developing radio problems and while in wing formation in IMC, the remaining generator failed creating a massive electrical power outage and loss of all fuel boost pumps crucial for sustained engine operation.

Instantly, both right and left engine fuel pressure low warning lights illuminated indicating imminent dual engine flameout. Major Brown immediately switched both failed generators to emergency, a last resort mode of unregulated and reduced electrical power. Major Carter called out emergency action steps and monitored flight attitude.

Despite operating in virtually a blacked-out cockpit, Major Brown quickly located the fuel control panel and restored partial boost pump operation before engine flameout occurred. Within minutes, due to an impending failure of the left accessory drive system, the left generator totally failed in the emergency mode, reducing boost pump operation to a dangerously low state for high engine power operation. Anticipating hydraulic system failure, Major Brown configured the aircraft early for approach and landing while Major Carter prepared for hydraulic system failure.

Unable to restore cockpit lighting, Major Brown had to operate by feel in performing descent and landing procedures, a task especially difficult while wearing a full pressure suit. While Major Carter, with only a flashlight and a very weak utility light, provided attitude and airspeed information, Major Brown successfully flew a 200-knot visual approach to a full stop landing.

The quick analysis and immediate response of Majors Brown and Carter resulted in the safe recovery of an irreplaceable national asset. WELL DONE! ■

Write A Dumb Caption Contest Thing

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

Write your captions on a slip of paper and tape it on a photocopy of this page. DO NOT SEND US THE MAGAZINE PAGE. Use "balloon" captions for each person in the photo or use a caption under the entire page. You may also submit your captions on a plain piece of paper. Entries will be judged by a panel of experts on dumb humor on 20 April 1989. All decisions are relatively final. ■

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