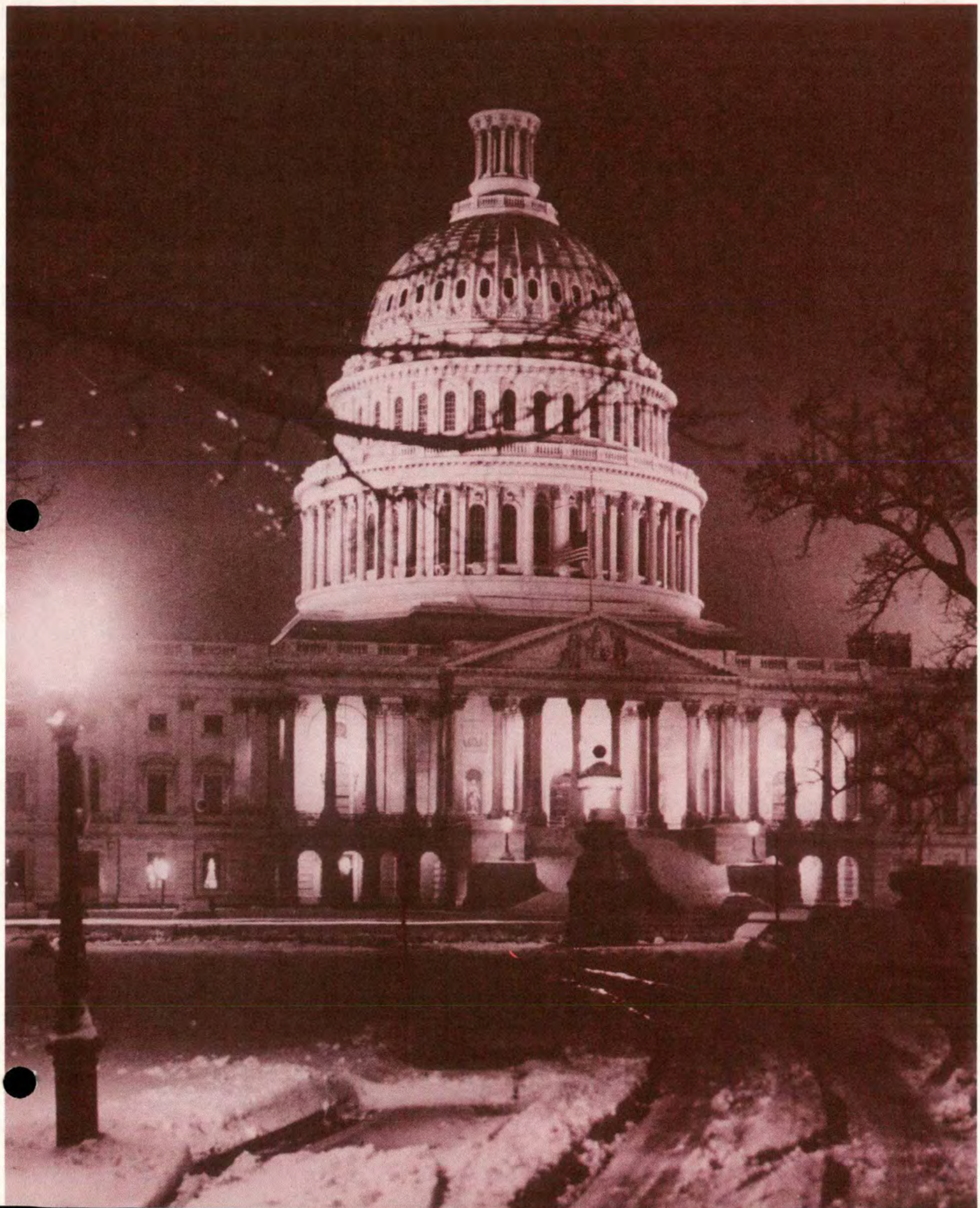
aerospace

SAFETY DECEMBER 1978



The Christmas—New Year holiday season is traditionally a time of happiness, well-wishing and dedication to doing better in the coming year. The season brings out the best in people and produces warm feelings toward each other that are not so evident during other parts of the year. In the Air Force, however, we have to have this feeling of compassion and empathy year round. The loss of a life or an aircraft affects us all, and we cannot afford an attitude of indifference or complacency. "Accidents will happen" cannot be part of our thinking.

We have done an excellent job this past year in maintaining our combat readiness posture with a continuing low mishap rate. However, there has been an increase in certain types of mishaps—a trend that must be reversed while maintaining the intensity of our training. This will require the dedication of each person in the Air Force to doing his job just a little better, a bit smarter, a little more thoroughly and with a lot of common sense. The rewards, I am confident, will more than offset the extra effort.

We in the Directorate of Aerospace Safety wish you a Merry Christmas and a great 1979. All of us working our mission together can make the New Year superb and safe. ★

GARRY A. WILLARD, JR.
Brigadier General, USAF
Director of Aerospace Safety

UNITED STATES AIR FORCE DECEMBER 1978

aerospace SAFETY

AFRP 127-2
Controlled circulation permit pending at Terminal Annex, 900 N. Alameda St., Los Angeles, CA 90052.

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REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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DECEMBER 1978 AFRP-127-2 VOLUME 34 NUMBER 12

EYEBALLS OUT

See and avoid

Have you had your NMAC (near midair collision) today?
Or, a real midair?

Do you know whether you've had either one?

You may think the latter question rather foolish, but the fact is that many NMACs occur daily with one or both crews oblivious to the fact. It's also true that you can have a midair collision and never know it. Until the damage is discovered on the ground, that is.

Whether there are more NMACs, or they're being reported more conscientiously, or our pilots are just more alert, we don't know for sure. It is a possibility, however, that despite all our modern equipment for traffic control, we may be having more NMACs simply because of traffic volume.

Within a period of about 10 days prior to this writing, the following incidents occurred, and they are not the total, just some of those reported. In each case there was something that made the event possible; and in nearly every case it was an alert Air Force pilot who prevented a possible midair.

- T-38—Pilot saw civilian aircr[aft] at 11 o'clock and took evasive action. Miss distance estimated at 100 feet. T-38 pilot was issued several advisories that traffic was squawking 1200 at T-38's 12:30 to 1:00 o'clock position prior to the pilot seeing the light plane. The civilian pilot did not see the T-38 until after it had taken evasive action. A factor was that the T-38 was on UHF while the light plane was on unicom.

- T-38 – Aircraft was on a PAR downwind when traffic called 12 o'clock, one mile. Pilot saw a head-on collision course and turned hard left. He estimated miss distance as 400-500 feet. It was believed that the pilot of the other aircraft never saw the T-38. A possible factor is that the small frontal profile of the T-38 with its white paint and high speed is hard to see.
- T-37 – Pilot saw a Cessna 172 approaching head-on and took evasive action. Radar was not painting any VFR traffic and stated that without a transponder they probably would not paint a primary return.
- T-37 – As the aircraft was passing 3,500 feet on departure, traffic was called at 11 o'clock, one mile. The pilot took control from the copilot and turned to avoid a midair collision. Miss distance was estimated at 300 feet horizontal. Both aircraft were operating properly. See and avoid by the T-37 crew plus departure's traffic advisory probably averted an accident.
- T-37 – IP looked to his right and saw a civilian twin approximately 200 feet away on a collision course. An immediate dive averted a collision. Other aircraft took no action. Miss distance was about 50 feet. Approach control was painting five aircraft but not on a potential collision course. The light twin was never identified.
- B-52 – Aircraft was making a penetration turn. Passing 11,000 feet the crew saw a low wing, single engine, white aircraft at their 11 o'clock. At 7,500 feet MSL, both aircraft took evasive action, coming within 200-300 feet of each other. Approach Control equipment was operating normally but did not receive a radar return, IFF/SIF code, altitude readout or transmission from the Comanche.
- B-52 – At 10 miles on PAR final the crew was given an advisory of an unidentified aircraft at three miles, 12 o'clock. The controller continued advisories and the B-52 crew sighted the traffic at one-half mile. A straight-ahead-climb averted a collision. The area is a busy one for aircraft, with a high midair collision potential. The wing has an active collision avoidance program with pamphlets and slide briefings for military and local civilian pilots.
- F-111 – The crew saw the other aircraft too late to take evasive action. Fortunately, the other aircraft passed over with approximately 100 feet separation. The F-111 was under radar control; no flight plan was on file for the other aircraft and it had no contact with the controlling agency. Contributing to this incident was the IFR/VFR traffic mix with no designated altitude separation (below 3,000 feet).
- UH-1 – The helicopter was on final approach when the scanner saw an A-10 closing rapidly. He advised the pilot to break hard right. The A-10 passed within approximately 200 feet.

So much for several NMACs. How about a MAC (the real thing). These folks had to be the luckiest people around at that particular time. A T-37 and a light twin collided with both recovering safely with no injuries. The T-37 IP heard a "bang" and the right engine fire/overheat warning light illuminated accompanied by an EGT rise and rpm winding down. He made an emergency landing without knowing the aircraft had collided with another. The light twin also recovered safely.

These and other unreported NMACs are telling us several things: There is a big midair collision potential; VFR and IFR traffic do not mix too well; while many civilian light planes have and operate transponders, many do not; those without transponders frequently do not show up on radar; "See and Avoid" is not good enough.

This does not mean the situation is hopeless. There is no question that many potential midairs are prevented by aircraft of all segments of aviation having identification equipment (transponders, altitude encoding equipment, strobe lights). Radar traffic advisories and ARTS III provide better utilization of the airspace with increased safety. The FAA is working on collision avoidance systems, particularly the *Discreet Address Beacon System* (DABS). The Hazardous Air Traffic Report (HATR) is helping identify the potential – be sure to report your NMAC. Meanwhile, we must do the best we can with what we've got. Funny thing about articles on midair collision prevention: the bottom line is always the same. Eyeballs out – SEE AND AVOID. ★

American aviation, its fine safety record notwithstanding, still records mishaps which take the form of aircraft being literally flown into the ground. In fact, this type of tragedy has occurred with such regularity that the descriptive term "controlled-flight-into-terrain" (CFIT) is used to narrate the sequence of events leading to a mishap.

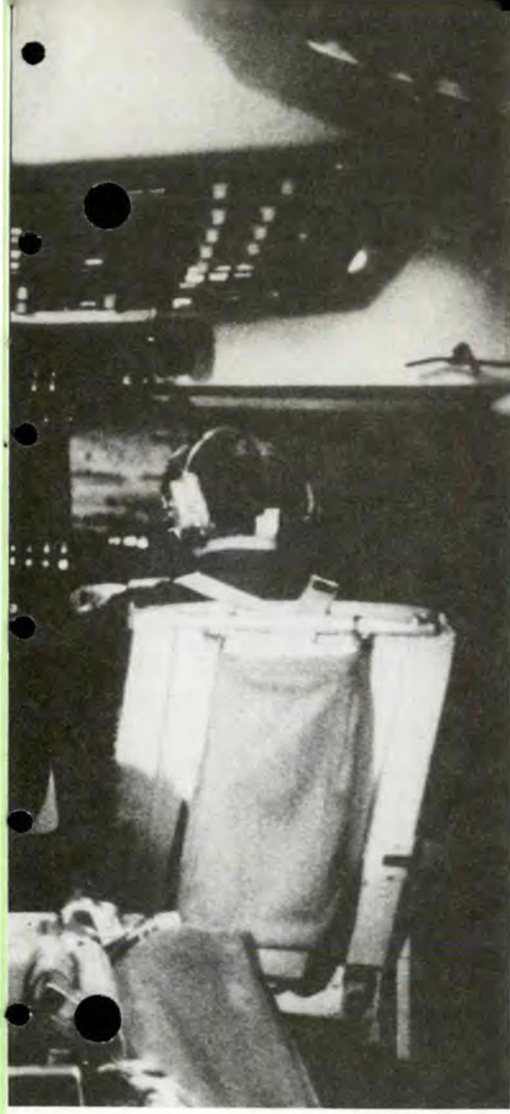
"A normal flight regime . . . no significant emergencies and no warning to the crew or controlling agencies of impending trouble . . . the aircraft impacts the terrain at some place other than the runway." This is a rather loose recital but it serves to illustrate the nature of these mishaps which leave safety experts with puzzled looks. How widespread are CFIT mishaps? Let's look at a few examples.

- At a Northern US base a strategic bomber, flying a night instrument approach in weather, crashes 3½ miles short of the runway – 11 fatalities. Investigators find no evidence of mechanical malfunction.
- A 4-engine transport, on radar vectors to destination base, crashes into the mountains in the Northwest. Sixteen people perish in the mishap. The aircrew accepted and flew a descent clearance that did not ensure adequate terrain clearance.
- A commercial plane, inbound to Dulles Airport near Washington, DC strikes a mountain after prematurely descending below safe enroute altitude. The report mentions communications confusion as a factor in the mishap.

CFIT mishaps – on the surface at least – appear to be preventable. The problem is to find the key. The list of proposed and initiated fixes is impressive: Radar altimeters, terrain alerting systems, coupled approaches, ground proximity warning system, etc. While these kinds of fixes can provide a partial remedy, the distinct human element in every CFIT mishap makes it extremely unlikely that hardware will be a universal cure-all. Since the CFIT accident is a uniquely human problem, the appropriate place to start our search is with people.

Rather than make an exhaustive listing of aviation human factor problems – which clearly exceed the scope and purpose of this article – let's examine one aspect of the CFIT people problem: Crew coordination.

When we use the term "crew coordination" we are describing a system that we hope will provide us with human redundancy. In the last 25 years mishap rates have shown a sharp decline in all but one area: The percentage of mishaps attributed to the aircrew. Statistics grimly



Crew Coordination

Major Roger L. Jacks
Directorate of Aerospace Safety

underscore this point. From 1966 to 1975, one billion dollars were lost to flight mishaps where human error was cited as causal. Further analysis indicates aircrews traditionally cause approximately 40 percent of our flight mishaps.

Perhaps a definition of crew coordination is the way to begin this discussion: "Crew coordination can be defined as the atmosphere which results when a team of capable individuals combine their talents into a unified, finely-tuned effort. They do this in such a manner that they are alert to the first signal of potential trouble." If we agree that this is an acceptable definition of good crew coordination, then failing "to achieve an atmosphere which is conducive to the fine-tuned effort" could be a definition of poor crew coordination. In the remaining paragraphs we'll take a closer look at those things that make or break good crew coordination.

Vigilance may be defined as a watchfulness or attentiveness to potential danger. Viewed in this light, more safety advocates would agree that a vigilant attitude is a desirable element in an aircraft cockpit. However, when vigilance is distorted by misplaced confidence, it can be self-defeating. For example, if crew members are reluctant to question the performance of the aircraft commander, then flight safety may be compromised and crew coordination may be defeated. Can this happen? The bomber mishap referenced above provides a positive answer.

As I stated earlier, the mishap occurred when the aircraft crashed 3½ miles short of the runway during a night instrument approach. The safety investigation board found no evidence of material failure; the bomber was apparently flown into the ground. This particular aircraft carries a six-man crew: Two pilots, two navigators, a defensive systems operator and a gunner. Four of the crew members – the pilots and navigators – should be directly involved in aircraft positioning and control, especially during the descent and landing phase of flight. The aircraft had sophisticated equipment on board which could have been used to determine the precise distance to the airfield. If the navigation team had used this equipment properly, they would have known that – at a point 3½ miles from touchdown, (the impact site) – the aircraft should have been at least 1,000 feet above the ground. This information relayed to the pilot team in time could have averted the disaster. Obviously, it was not.

Crew Coordination continued

The bomber navigation team assumes a significant responsibility for aircraft positioning during all flight phases. However, for a multitude of reasons, the navigation team—at least at the time of the mishap under discussion—did not play an aggressive role during the descent and landing phase. Why? Is it overconfidence in the airmanship of the pilot team? Or, is there a seniority barrier which restricts free and open communication? Whatever the reason, crew coordination failed and flight safety was compromised. Of course, this same type of problem can occur in the cockpit of any aircraft.

For example, an aircraft is making a nonprecision approach to a strange field in the weather. As the aircraft passes the final approach fix, the crew is advised that a snowstorm is moving across the approach end of the runway. The correct altitude calls are made as the aircraft penetrates the snow. A crew member assumes the aircraft will be leveled off at MDA if the runway is not in sight. But the descent continues through the MDA, some trees are struck, a go-around is made and a subsequent uneventful landing is made at another field.

This is an example of capable individuals failing to combine their talents into a unified crew effort. Something was amiss in the cockpit atmosphere. There may have been several factors present that caused the poor crew coordination. For example, the manner in which command was exercised and accepted could have adversely affected crew cooperation, mutual respect and perceptions of responsibility. An improper cockpit atmosphere could have bred such things as misplaced confidences, seniority/experience barriers and timid crew members. In the case of this crew, one or more of these factors had produced a cockpit atmosphere best described as: "A group of individuals who happen to be traveling to the same destination in the same cockpit."

All of us are subject to human failures, but we can reduce the frequency of these failures. Integration of flight crew activities can most certainly give us error protection through human redundancy. Crew coordination is the basic building block to mission success. Let's look at some benefits to be derived from good crew coordination.

- Each crew member is informed on all aspects of the mission.
- Each is thoroughly familiar with the "plan of attack" for accomplishing the mission.
- Crew members have no unresolved questions about their duties during any part of the mission.
- Each crew member is proficient in his crew duties including all normal and emergency procedures. He is knowledgeable and feels confident he can do his share in accomplishing the crew mission.
- The crew, through proper coordination, has ensured the required mission materials are on board the aircraft; i.e., flight pubs, flight plans, maps, letdown books and mission paperwork.
- Each crew member maintains a constant vigilance of aircraft systems and aircraft activities.
- An effective communication system exists among crew members that passes valuable information in a timely manner.
- The crew has a system of cross-checks to ensure critical events are monitored by as many crew members as possible.
- Crew members give each other positive feedback on mission activities. Praises are handed out when the job is well done and constructive criticism is given when crew performance is less than desirable.
- The crew strives for and promotes espirit de corps. They support each other on the ground and in the air—on the job and off the job.

Crew coordination, it can mean the difference between mission success and mission failure. It separates the really good crew from the mediocre crew; and as past mishaps have proven, it can be the difference between life and death. ★

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THERE IS A WAY

Annually the Air Force recognizes a given number of individuals, units and commands for outstanding performance in safety. However, competition is keen and not all win major awards. To recognize all of those, AEROSPACE SAFETY is featuring one or more in each edition. In this way we can all share in recognizing their fine performance and, perhaps, learn some valuable lessons.

Nominated for the Colombian Trophy

84 Fighter Interceptor Squadron (ADCOM)

The 84 Fighter Interceptor Squadron at Castle AFB, CA, flies F-106s and T-33s. Last year it flew 6,794 hours, bringing the squadron total accident-free flying hours to 34,800.

1977 was a busy year for the 84th, with nine deployments, five of which involved dissimilar Air Combat Tactics with Tactical Air Command forces.

These required 394 sorties. Exercises included "Jack Frost 1977" and "Red Flag" operations. In addition, the squadron participated in 24 exercises directed by higher headquarters while maintaining four aircraft and crews on full time alert.

Among the problems overcome by the 84th were operation of a fleet of aircraft with both tape and round instrument systems, and dense fog characteristic of the winter months in the San Joaquin Valley. In reaching 64 months of accident-free flying, the 84 FIS made a significant contribution to Air Force Readiness during 1977.

302 Special Operations Squadron (AFRES)

Sixty lives saved over five years and 19,000 accident-free flying hours add up to quite a record.

Those accomplishments are owned by the 302 Special Operations Squadron, Luke AFB, AZ, whose primary mission is Special Air Warfare (SAW). The SAW mission includes support of counterinsurgency, unconventional warfare, and psychological operations.

Tasks include aeromedical evacuation, airborne command post, air strike and control, combat air rescue, visual and photo reconnaissance, and support of Army and Navy special forces units. The squadron aircraft is the CH-3E helicopter.

Operations often call for low level navigation (100 feet AGL), missions in mountainous terrain, flying into unprepared landing zones, and overwater flights.

Accident prevention efforts include review of the flying schedule personally by the DO, who also flies with every pilot and mechanic on a regular basis.

Crew chiefs fly with their aircraft. The standardization program is based on the concept that the more proficient a crewmember is, the more safe.

From 1968 through 1977 the unit went through two aircraft conversions while accumulating 19,000 accident-free hours — an outstanding accomplishment. ★

failure to communicate

A recent aircraft mishap points out the need for better communication between the ops and maintenance folks. The mishap involved structural damage to the aircraft's variable air inlet system and subsequent foreign object damage to the engine as the result of overpressures associated with violent compressor stalls.

In this case, both maintenance and operations personnel made some errors over an extended period which allowed damage

When the measure of successful maintenance of your aircraft depends on good communications, is there any extra effort you can make that isn't worth it?

Major Cleveland Simpson
Director of Aerospace Safety

from the compressor stalls to go undetected and progress to ultimate failure of inlet structural components. Specifically, operations supervisors failed to specify which engine abnormalities required pilot write-ups and ensure that the write-ups were detailed enough to generate appropriate maintenance action. As a result, pilots wrote up the aircraft for engine stagnation/afterburner blowout when, in fact, the aircraft had experienced compressor stalls.

Compounding the problem was the fact that since the entries in the aircraft forms dealt only with engine stagnation/afterburner blowout, maintenance personnel did not accomplish an in-depth intake inspection because existing tech data did not require it. If, however, the discrepancies had been written up as compressor stalls, a detailed inspection would have been required by tech data and the cumulative damage which had occurred during the past several flights could have been discovered.

Maintenance personnel, on the other hand, could not be completely exonerated, since it appeared they were less than zealous in getting to the root of the problem after repeated write-ups. Besides not pressing the pilot for a more detailed write-up, they missed at least one opportunity to prevent the impending mishap when they previously changed the engine for FOD from an undetermined source. It is quite probable that this FOD was from initial damage/breakup of the variable inlet structure; however, failure to tie the FOD occurrence to previous stagnation/afterburner blowout incidents, or to accomplish an in-depth inspection once the source of the FOD could not be determined, allowed hidden damage to go undetected.

Although this mishap involved a little-understood phenomenon associated with newer generation, high performance aircraft, it is an extreme example of what can happen when ops and maintenance personnel fail to properly communicate on aircraft discrepancies. Operations supervisors must ensure pilot entries in the aircraft forms describe the discrepancy as clearly and concisely as possible. They also must ensure their pilots thoroughly understand the aircraft and its systems and are provided with specific procedures for making accurate analyses of problems as they occur. Granted, pilots cannot always be expected to make the proper assessment, considering the complexities of modern aircraft systems and the rapidity with which failures can occur. This is partly the reason why airborne recording/diagnostics systems have been included on certain aircraft or are under development for others. However, until these systems are put into widespread use, maintenance debriefing takes on added importance as a forum for direct communications between operations and maintenance personnel. In addition to apprising maintenance personnel of the circumstances associated with routine discrepancies, pilots must make full use of the available technicians/specialists to assist them in making accurate entries regarding discrepancies which they may not fully understand.

For their part, maintenance personnel must make an earnest effort to assist the pilot and correctly discern the nature of the problem which the pilot is attempting to report. When it becomes obvious that the write-up does not contain enough information concerning a particular problem, an in-depth investigation must be made—including further discussions with the pilot, if necessary. Only then can we avoid future mishaps such as the one described above. ★

PROFESSIONALISM

Most of us think of ourselves as professionals regardless of what we do. However, each of us can probably think of unprofessional things we have done – things which we are not too proud of – unprofessional things.

True professionalism seems to stem from a combination of contributing factors. Knowledge or education forms the base for any professional. Not just the basic knowledge, but the advanced courses, specialized courses, dedicated self-study and professional reading. The professional pilot needs to continue his studies after UPT and RTU/CCTU/TTU. IP courses, advanced aerodynamics courses, Air Ground Warfare courses and seminars on new techniques and procedures are the equivalent of medical specialization and continuing education for a doctor. The truly professional pilot also reads more publications than just *Aerospace Safety* and *TAC Attack*. *Aviation Week*, *Interavia*, FAA and NTSB reports, and reports of the American Institute of Aeronautics and Astronautics are just a few of the professional aviator's trade journals. Continued learning is a never-ending goal of a true professional.

Experience is another essential element of professionalism. A doctor cannot practice medicine until serving a period of internship following his education. Likewise, a plumber cannot be licensed without a period of apprenticeship. It would be naive to believe that a pilot could be called professional without a seasoning period under close supervision. Experience is not achieved when a check ride is passed or a minimum number of flight hours reached. Experience is achieved when all required tasks can be accomplished consistently well. When a fighter pilot can hit the target consistently with his guns, bombs, rockets and missiles, under the most adverse conditions, anywhere in the world, handle all emergencies well, fly excellent formation

Lt Col Charles L. Pocock, Jr.
Directorate of Aerospace Safety

and instruments to minimums and lead his fighting formation, he is considered experienced. Experience is an individual thing. To really be experienced may take two years or twenty years. Some never achieve it, especially if they don't remain dedicated to the cockpit.

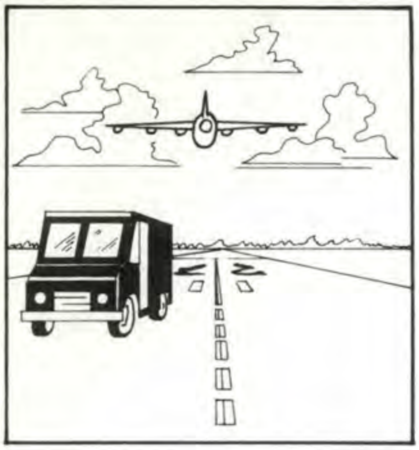
The third major element of professionalism is confidence. Confidence is not just self-confidence but the confidence your supervisor, operations officer or commander expresses in you. Confidence is perhaps the first sign that you've "arrived" . . . the confidence which others have in your abilities . . . confidence which allows your judgment to remain unquestioned . . . and finally, the confidence of reputation which forms the basis of leadership.

A key sub-element of confidence is judgment. A professional has the ability to analyze a situation – apply knowledge tempered by experience and make a correct decision. A professional pilot exercising sound judgment can successfully maneuver his aircraft at the extremes of its performance envelope without going too far – ever. He knows not only the aircraft's limitations, but also his own limitations, and he considers all factors in his judgment. Such things as closure rates, weather conditions, reaction times and so on, are things which are automatically a part of his decision process.

The true professional knows what he can do and what he cannot do; he also knows what he should not do because the risk is too great. The true professional doesn't "take more chances" than the nonprofessional, although it may often seem that way. The real professional is just better and can do more with the same aircraft.

Professionalism is more difficult to achieve than courage and, although courage is essential, pilots noted for their professionalism seem to live a lot longer than pilots noted only for their courage. ★

OPS TOPICS



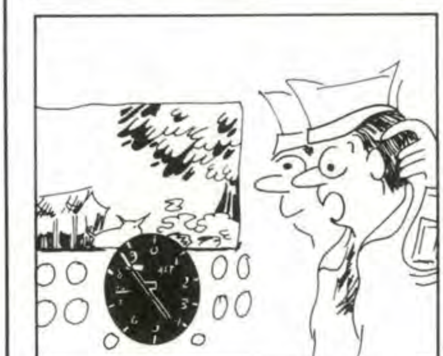
"CLEAR"ED TO LAND?

The transport had been cleared for an ILS approach and had been given clearance to land by tower. On short final the pilot saw a vehicle on the right side of the runway. The pilot leveled the aircraft and, when clear of the vehicle, he landed approximately 4,000 feet down the runway.

How did it happen? A runway change was in progress and fire department and barrier maintenance vehicles had been cleared on the runway to reconfigure the barriers. When the C-130 was at 13 miles, the ground controller (GC) called to confirm that the vehicles were clear of the runway. However, because the GC had not written down the call signs of the vehicles on the runway, he assumed he had confirmed that all vehicles cleared the runway, which was not the case. The senior controller queried the ground controller concerning any vehicles on the runway, and after the GC scanned the runway and saw no vehicles, landing clearance was issued. The GC's vision of the runway was hindered because of fog/haze and he was looking directly into the sun.

CHECK THE WATER, SIR?

A CT-39 recently experienced an engine flameout climbing through 39,000 feet. After five unsuccessful attempts at airstart, the pilot finally got a relight on the sixth try. Investigation at home base revealed significant amounts of water in the fuel system. In the opinion of the investigating officer, sufficient water was present to flame out not only one, but both of the engines! Most likely reason for the presence of the water? Failure to drain the aircraft fuel system following refueling operations or during the preflight inspection. The requirement is clearly stated in the checklists for each operation. – Sqn Ldr Peter White, RAAF, Directorate of Aerospace Safety.



PITOT STATIC ICE

After 2 + 30 hrs of flight at altitude, the pitot static system on an RC-135 malfunctioned, producing erroneous readings on both the pilot's and copilot's instruments. At 12,000 feet on descent the system returned to normal. The aircraft had been subjected to heavy rains for three consecutive days and moisture trapped in the system froze. Purging the system prior to takeoff will prevent this type mishap.

HYPOXIA INCIDENT

A recent hypoxia incident provided some reminders that all aircrews should heed. The WSO in an F-4D removed his oxygen mask several times because it was irritating his skin. That and a leaking canopy seal that raised the cabin pressure altitude caused him to become hypoxic. The pilot, after some poor responses from the back-seater, noticed the WSO's head was down. He immediately told him to go to 100% oxygen and tighten his mask, declared an emergency and descended to 10,000 feet. The WSO came around quickly and had no further trouble.

Some of the things this incident brought out are:

- Many crews apparently do not really know what the cabin pressure gauge should read.
- Time of useful consciousness (TUC) drops as cabin pressure altitude rises.
- Crews must be alert to their personal hypoxia symptoms.
- Use supplemental oxygen when cabin pressure exceeds 10,000 feet.
- Spend some time with your physiological training folks now and then. Three years between chamber rides is quite a while, especially for the new guys.

ERRANT PLATE HOLDER

The KC-135 was in the landing flare when the approach plate holder fell between the control column and the pilot's seat. This prevented full stick travel and resulted in a "firm" touchdown, bounce and another smooth, touchdown. Apparently the

OPS TOPICS

refueling drogue basket struck the barrier cable which caused the basket to break off. If the plate holder is not positioned in its mount just right, it can be easily dislodged by the pilot's knees during rudder inputs. When this happens, it lodges between the seat and control column. A fix shouldn't be too difficult.

A CASE OF BAD AIR

While an 0-2A crew was doing some air work, both pilots developed minor headaches which they attributed to the high heat and humidity. Opening the air vents helped. When they returned to base and began final with the windows closed, their headaches returned and they had some coordination and concentration difficulties. On missed approach they both felt groggy, tired and lightheaded. They ventilated the cabin, declared an emergency and immediately landed. Maintenance found a hole in the heater air mixture box caused by the muffler rubbing against the box. The hole allowed engine exhaust to enter the cabin. The problem was aggravated by a missing rear fresh air window. Air drawn out through the hole disrupted normal air flow and directed contaminated air into the crew's faces. Lesson: Know your symptoms.

A CLOSE ONE!

Aircraft A was flying the Ascension Island – Antigua Island route as depicted on Caribbean and South American area chart number 1, panels C and D. Aircraft B was flying UG-2. The crew on aircraft A had transmitted in the blind on VHF frequency 126.9 their ETA and coordinates for crossing UG-2. Aircraft B's crew did not hear the broadcast and did not make any radio calls of their own. Since aircraft A's crew interpreted FLIP to mean that if there was no reported traffic they did not have to change altitude, they did not initiate a climb until they spotted aircraft B's rotating beacon. This put them 500 feet off altitude (FL335) when aircraft B passed in front of them at FL330.

- Both aircrews were unaware of each other's presence until the crew of aircraft A saw aircraft B's rotating beacon.
- The wording of paragraph 18 page 5-5 in FLIP allowed aircraft A's aircrew to misinterpret the requirement for climbing off altitude.

The Defense Mapping Agency Aerospace Center was contacted and will change FLIP at its next publication to clarify procedures when flying in this area. In the meantime, a NOTAM was published on 18 August 1978. It requires aircraft flying off airways in uncontrolled airspace and unable to maintain two-way radio contact with the appropriate civil agency to climb off normal flight level from 32 NM past the airways.

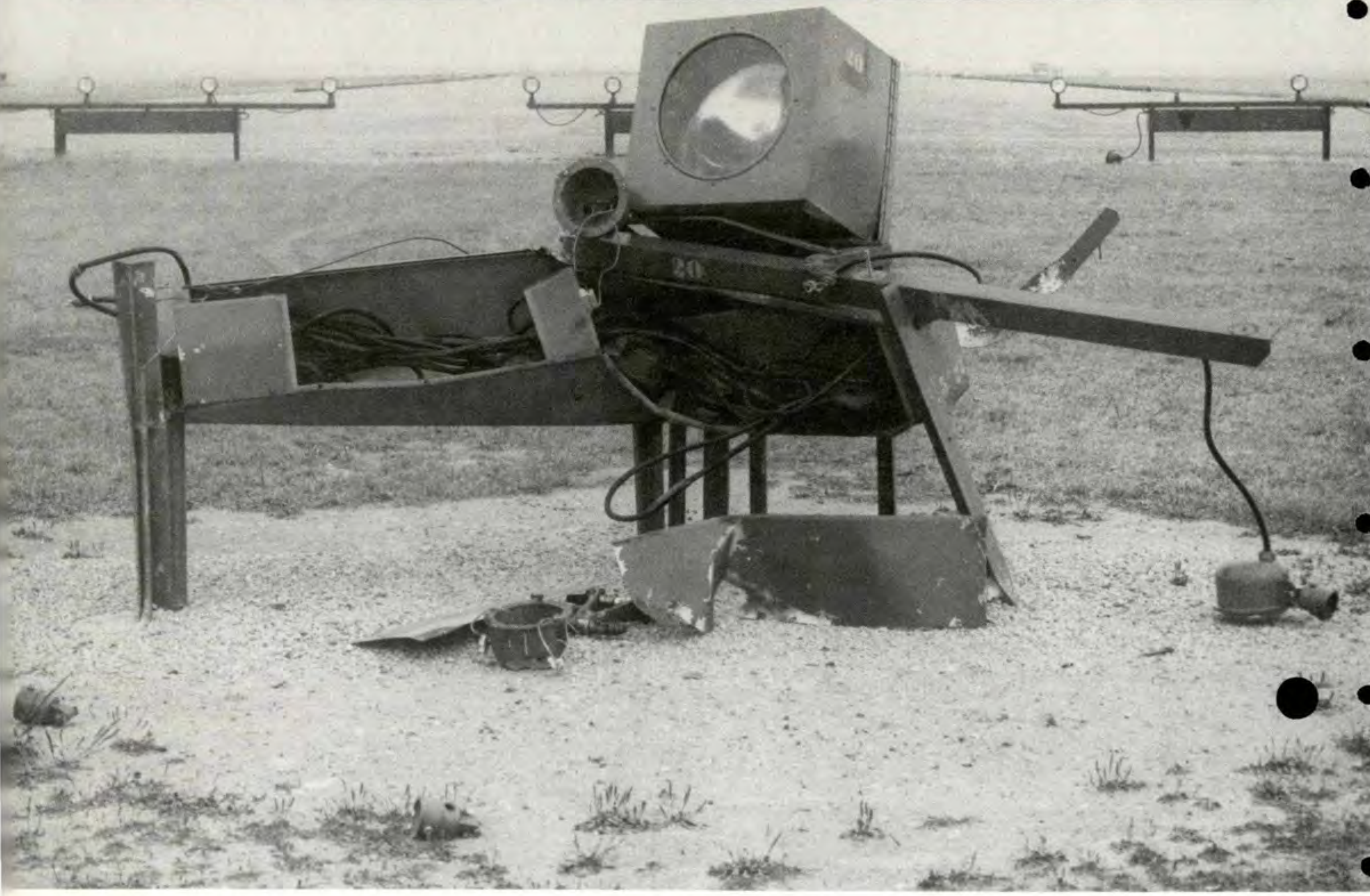
FAA TO TEST COLOR RADAR DISPLAYS

The Federal Aviation Administration is adding color to its radar scopes in a test program aimed at helping air traffic controllers distinguish between different types of information on the scopes. The test program will be conducted at the agency's air route traffic control center in Leesburg, VA.

Three colors – red, orange and yellow – will be added to the present monochromatic radar displays which show all information in green. Red will be used to depict map lines and navigational aids and orange for weather. Yellow and green will be employed for aircraft data blocks which provide controllers with the identity, altitude and other information on the flights they're handling.

The test at Leesburg is scheduled to begin in April 1979 and run for four months. The success of this effort could lead to implementation of color radar displays at all 20 air route traffic control centers. Test color displays may also be conducted in radar-equipped airport control towers. ★

NO SHORT LANDINGS?



You're dreaming and imagine yourself flying from the back seat on final approach for a touch-and-go with the aircraft nearing touchdown. You feel a thump and go to immediate attention. What was that? You look left and see a light fixture flying through the air.

You take it around, leaving the gear extended, line up and land again. When you apply the brakes, the left one doesn't work; however, you manage to get stopped on the runway.

Sure enough, you knocked off two lights that stood in the overrun. Those lights are about two feet tall.

Switch now to another dream sequence. Again on final with the intention of landing 500 to 700 feet past the threshold. You're on speed, with a shallow descent, and you notice the sink increasing. You adjust the pitch and add power, but not enough. The bird touches down and hits a six-inch concrete curb with the right and left stabilators. You also take out a couple of runway lights.

Now the nightmare begins. Your fighter strikes a mound of excavated runway material 1,500 feet short of the displaced runway threshold. You're able to go around but the damage can't be assessed, so you eject —successfully.

Again, you're flying a fighter. On formation final—you're number 2—the aircraft touches down 1,500 feet short of the runway, remains on the ground for nearly 1,000 feet and becomes airborne. You and the WSO eject—again successfully.

Now you're in a many motored craft. The weather is lousy. When you reach decision height you go visual, get below the glidepath and hit a strobe light panel. You fly it out and take it to an alternate where you land with three flat tires and a missing left gear door. The passengers give a sigh of relief.

Congratulations. You have just survived most of the short landing mishaps reported in the Air Force over a two year period, July 1976 through July 1978. The total was eight, of which four were Class C, one Class B and three Class A.

Now we're not going to brag about this record, but, considering the number of landings made within that period, we could have done much worse. In fact, we probably did a whole lot better than in previous years. Nevertheless, this is a subject we should address.

So, you ask, why now? Good question. For the same reason you take your flu shots each fall. Preventive medicine. So roll up your sleeve and prepare yourself.

There will be a short landing from time-to-time. Some long ones, too, but we'll address that some other time. Short landings *usually* result from some faulty headwork back out there on final.

- The weather's a little skosh and a duck-under attempt winds up with the tires laying marks on the overrun.

- There are some ice patches on the runway, or water, or whatever. The pilot figures on using all he's got and plans to put it on in the first 500 feet or less. You know the rest.

- For some reason—wind gusts, tight turn to final from an overshoot, just plain poor judgment—the airspeed ain't what it should be and the bird sinks faster than the driver thinks. Whomp! There go some lights, tires, a lot of ego and, in the worst case, an airplane.

Some short landings aren't really that at all. The aircraft and the ground get together so far from the runway that the mishap should be categorized as a collision with the ground—a crash! These are the ½-mile and greater short landings. We haven't had one for a while but there are a lot of them in the files. For some strange reason, many of these involved big, multi-crew aircraft. You'd think at least one of the jocks would know where they were in relation to the runway.

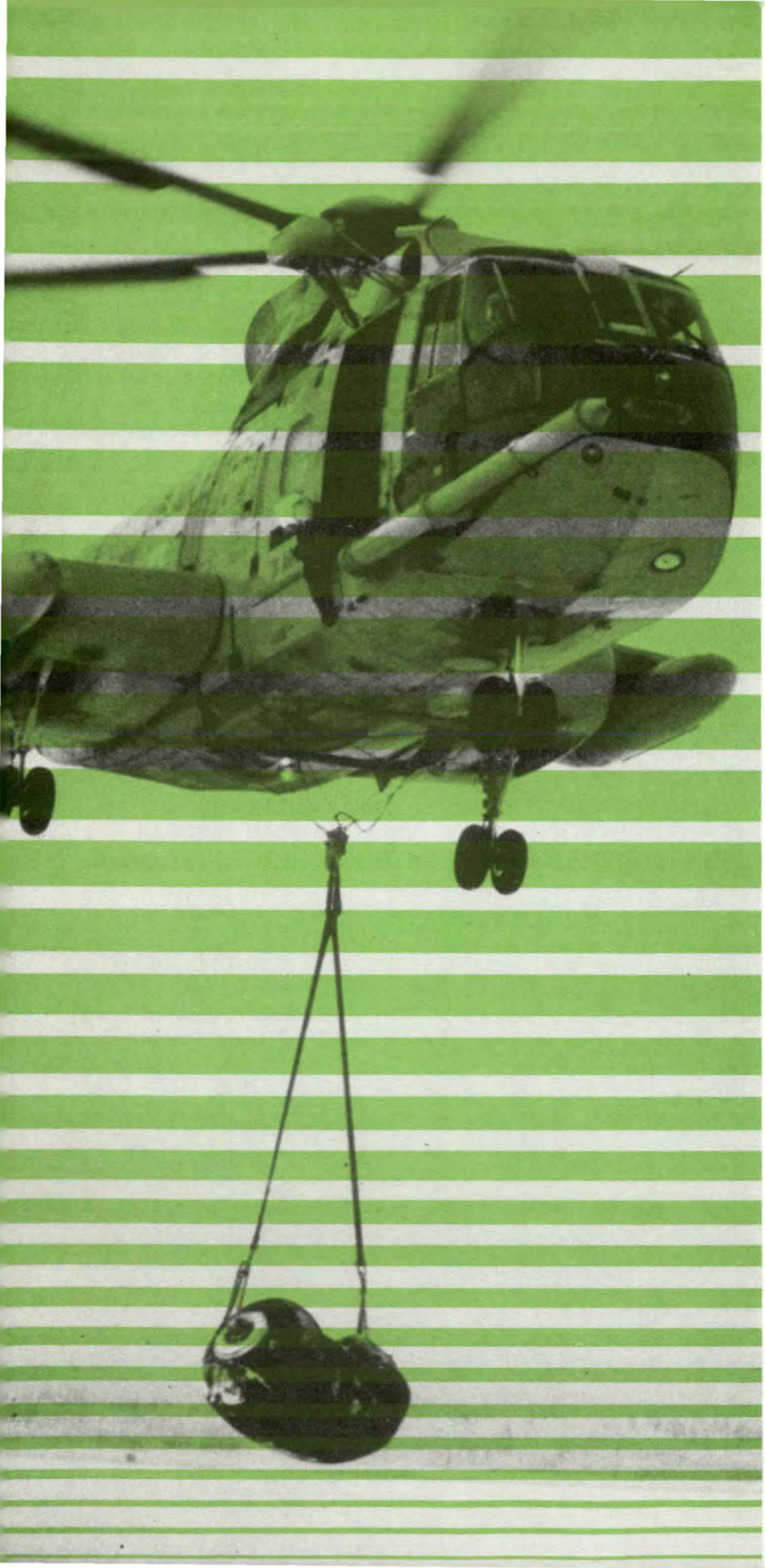
The landing phase has always been considered the most dangerous period of flight. We don't believe this has to be so, not so long as the aircraft is healthy. With a sick bird, all bets are off. But with a good aircraft and the nav and landing aids available today, there just isn't any valid reason for a short landing.

We've had our share in the winter when the pilot reported he couldn't tell the overrun from the runway because of snow. With a properly cleared runway, lights and VASI, even one-eyed Jack ought to put it safely on the runway. And if the weather is in the weeds, there are some options better than pressing on and hoping things'll work out your way. There's nothing wrong with taking it around and even to your alternate if you don't like the looks of the situation at your destination. That's the mark of a smart pilot—not just a determined one.

One of the things we have to lick in this flying business is the expectation that when we arrive at our destination, we are going to land— *on the first attempt!* This is a well-recognized syndrome that should be dealt with once and for all. There is no stigma to *not* landing on the first attempt. In fact, only a blockhead will sit there and drive the aircraft into the ground rather than exhibit the fact that he just can't make it—without a lot of luck.

This is the December issue of *Aerospace Safety.* We sincerely hope that when next December comes up on the calendar that we can report "no short landings this year." ★

" . . . He couldn't tell the overrun from the runway because of snow."



FLICKER

Alias Flicker Vertigo

LCDR Jane McWilliams, MC, USNR
TRAWING Six Flight Surgeon

It has been known for a long time that under certain circumstances, grand mal (generalized) seizures can be induced in a small number of individuals by exposing them to flashing light. This seizure phenomenon has occasionally been lumped with other common effects of flicker (irritation, nausea, dizziness, drowsiness, disorientation) under the broad label of "flicker vertigo." Unfortunately, the word vertigo has a specific meaning to both aviators and physicians which makes the term "flicker vertigo" confusing. It is not even certain that the different effects of flicker are related. When talking about the seizure effect of flicker, therefore, it is best to use the term flicker-induced seizures.

There are countless ways that normal flight operations can cause flickering in the critical frequency (1-20 flashes/sec). Having an anti-collision light on in the clouds, flying past a row of clouds through which the sun is shining, operating a single-engine prop plane at low rpm while facing the sun, or operating a helo in the bright afternoon sun can all cause the flicker phenomenon. One hundred percent rpm on H-46s is 264. Multiplying this by three (three blades) and dividing by 60 to convert to seconds:

-INDUCED SEIZURES:

$$\frac{264 \text{ rev/min} \times 3 \text{ flashes/rev}}{60 \text{ sec/min}} = 13.2 \text{ flashes/sec}$$

It seems obvious that all the flight surgeon has to do is find the individuals who are sensitive to flicker-induced seizures and keep them off aircraft. This is easier said than done. Since 1961, the Navy has required a baseline EEG (electroencephalogram or brain wave test) on all student naval aviators as part of initial screening for flight training. The test has been required on student naval flight officers since 1967 and student flight surgeons since 1971. Since 1967, these EEGs have also been recorded during photic stimulation (flashing lights), and those showing abnormal brain wave response were eliminated from training. A check of the Safety Center's files, however, reveals at least two cases since 1969 of previously screened individuals who had seizures during flight which could not be explained by other factors. At least one of these seizures was probably flicker-induced. So, even with EEG screening, one still cannot predict with certainty which people will or will not have seizures. Because of the low yield of EEG screening, it is not practical to test all aircrewmen and potential passengers.

Besides the flicker phenomenon, hyperventilation, fatigue, and over indulgence in alcohol have been known to trigger seizures in individuals prone to seizures. Head trauma, hypoxia, drug withdrawal, and cold exposure can cause seizures in previously normal individuals.

Fortunately, seizures during flight are very rare occurrences. However, even with the best screening techniques flight surgeons have, seizures will occur occasionally on . . . aircraft. Everyone in . . . aviation needs to be aware of the possible hazards of seizures in the aviation environment. Everyone should be able to recognize a seizure and institute appropriate first aid measures.

RECOGNITION OF A GRAND MAL (GENERALIZED) SEIZURE

1. Initially, the victim may complain of a strange feeling, or there may be no warning at all.

2. The victim may cry out; if standing, he will fall to the deck and lose consciousness.

3. His muscles will at first become tense and his body will become rigid. Breathing may stop temporarily and his face may turn blue.

4. The muscles of the body will then begin to jerk spasmodically. Breathing usually resumes but may be labored if the tongue has fallen back, obstructing the airway.

5. The victim may bite his tongue, froth at the mouth, or lose bowel and bladder control during the attack.

6. The seizure is usually over in a few minutes. The victim may be unconscious or semiconscious for a variable period of time afterwards.

FIRST AID FOR SEIZURE VICTIM

1. If possible, place a gag between the patient's teeth to prevent tongue biting. A wallet or a plastic airway makes a suitable gag. Avoid injuring the patient by trying to force something between clenched teeth. Never use your hand as a gag.

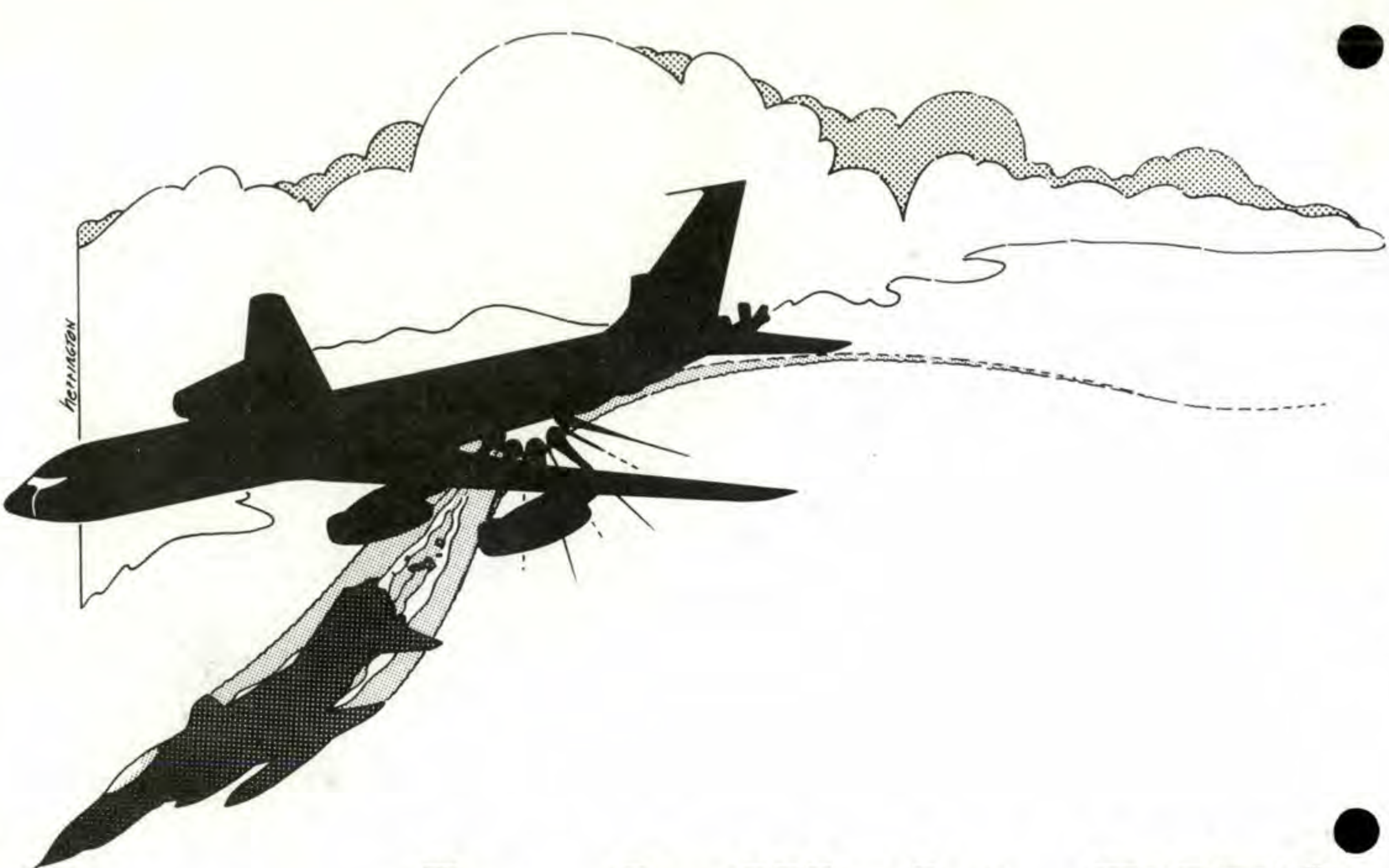
2. Loosen the patient's clothing.

3. Make sure the patient starts breathing again and has an open airway. Initiate CPR if necessary, but it rarely is.

4. Protect the patient from injuring himself during the jerking phase. Do not forcibly restrain the victim unless this is necessary for flight safety. Injuries to the patient can be caused by overzealous restraint.

5. After the seizure, keep the patient warm and quiet. Turn his head to the side to prevent his choking should vomiting occur.

6. Anyone who has a seizure should be evaluated by a medical officer as soon as possible. — Courtesy *Rotor Breeze*. ★



An Inflight RIF?

Captain David E. Pine 4235th Instructional Systems Development Squadron Carswell AFB TX

Routine. The process had been accomplished so many times in the past it was hard to remember there were even written procedures on how it was supposed to be done. The chick, an F-4, had been taking drinks from the KC-135 Stratotanker on a regular basis on the way back to the States.

As is common for this type of mission, the tanker aircraft was the cell leader, providing navigation and fuel on the long redeployment flight from Europe for a fourship of F-4s. What made this trip a little different was the fact that it would include a midair collision.

It began innocently enough. The last receiver to get a sip of JP-4 just sort of slid back to the trail position on the tanker rather than joining back with the rest of the flight on the wing. The boom operator, having watched his chick drop back after refueling, cleared off interphone and proceeded to the cockpit with the rest of his crew. Nobody was really breaking the rules too badly at this point, just bending them you might say. That's just the way Mr. Murphy (of Murphy's Law fame) likes to start things out.

The receiver should have pulled back into the wing formation but instead dropped back to do a little systems checking and "jot a few items down in the log." The tanker boomer should have known the position of his receiver before leaving station, but after having watched the initial actions of the fighter "assumed it would do what they always do." We know what "assume" does to us, don't we?

And the tanker pilot, Mr. Cell Lead, he should always know the position of the people in the cell, right? Sure. We've all been there.

As things would happen, the receiver was pretty heavy having just taken on fuel. Since his RPMs were up, he hardly noticed the slight increase in airspeed, which, of course, made for a slight decrease in distance between him and the tanker. The decrease continued until "the first time we (pilot and backseater) knew something was wrong was when a shadow filled the cockpit." Finding themselves directly under the tanker, which now looked like a squadron of C-5s, the pilot tried to avoid a midair.

This is where Murphy was right on the job again. Rather than execute the standard breakaway maneuver by pulling power and nosing over, the F-4 jock applied power and tried to fly under the tanker. Unfortunately, although he did have headroom clearance, his tail wasn't quite as lucky and ripped into the undercarriage of the 135.

The collision left pieces of F-4 tail imbedded in the tanker's gear doors and a 4-foot section of vertical stabilizer missing from the receiver. Murphy was pleased, but through a few lucky breaks for the two crews, both made it to a safe landing at an emergency airfield. Murphy hopes to do better next time.

What went wrong? Why did two highly trained crews flying expensive aircraft blow it so badly? The answer: lack of communication and failure to comply with directives. Pretty boring stuff, I must admit. But that's the answer.

This story isn't going to end in the traditional lecture on "know your responsibilities and procedures." Some people have a lot of experience as flight crews, others less. One thing we all have in common is professional training and a set of rules which has been developed by foresight and hard knocks. Let's take advantage of them by being heads up even though things are "routine." Avoid applying "new" procedures just because you find yourself in an unusual situation. Remember, communicate your intentions to the rest of the flight; to "assume" cannot only make a "you-know-what" out of you and me but can result in an in-flight RIF. ★

STRESS

Anchard F. Zeller, Ph.D
Directorate of Aerospace Safety

At age 29 the pilot was dead. Mercifully, there is little lingering pain associated when an aircraft strikes the ground at high speed. There is also no time for preparing an introspective analysis, which would be of great assistance to the board convened to find the cause of the crash. It seemed to that group, after exploring every avenue, that the aircraft was sound, the situation not over whelming, and the weather irrelevant. Review of the pilot's background suggested that training and experience were adequate and that his physical condition was sound. There were some acute personal problems in his immediate past. In frustration, the board concluded the exact contribution of this psychic stress to the accident was impossible to quantify.

This board's frustration is typical. Take, for example, the case of the pilot at a TDY base, knowing that he was going home to an involved and unpleasant divorce action. The weather was bad, and an unanticipated delay in takeoff resulted from some last-minute required maintenance. Approximately 2 minutes after the initiation of flight, the aircraft flamed out—the pilot was killed. Subsequent investigation showed that the flame-out was due to failure of the pilot to properly operate the fuel system and that, had ejection been elected, it would not have been possible because a safety pin had not been removed.

HIS LAST COMMUNICATION

Or, at the other end of flight—3 minutes out, a fighter pilot routinely contacted approach control and requested a penetration. He was instructed to descend to 20,000 feet. He was next asked if he would accept a VFR descent to 5,000 feet and was instructed to descend to that level and await instructions. Eight minutes later, he confirmed that he had reached that altitude. That was his last communication. Two minutes later, a witness saw the aircraft strike the ground. Investigation indicated that the pilot knew that his wife would be waiting for him—would be waiting for a showdown. The widow was advised of her right to disposition of the remains. The four fatherless children, caught up in circumstances beyond their control, felt only sorrow.

The nagging suspicion that psychic pressures contribute measurably to such tragedies is not new. The problem of quantifying such effects, however, has seldom been attempted. One recent approach attempts to list life events in terms of traumatic severity, ranging from the death of a spouse, which is assigned the maximum of 100 points, down to minor violations of the law, which are considered to have only an 11-point impact. The ultimate hope of this project is to find a method of accumulating the impact of these life change events in a quantitative fashion and determining some point at which the individual and the administration are alerted to the possibility that the impact may be severe enough to cause major behavioral change.

PSYCHIC PRESSURES CREATE STRESS

The more recent approach being pursued by the Naval Safety Center is to relate these psychic pressures to increased accident potential. Now this isn't going to be a particularly easy task. The stress levels which individuals can tolerate vary tremendously, and the events which provoke this stress are variable enough so that standard averages may well not be refined enough to use as a predictor of increased accident potential. In spite of these limitations, however, the approach represents formal acceptance of the intuitively held feeling that psychic pressures can create stress which will directly affect skilled behavior.

A nagging question which arises in any attempt to relate specific background events to accidents is whether the population at large is subjected to the same pressures in the same proportion as those who receive acute attention because of their unfortunate involvement in some kind of mishap. The bigger problem then becomes one not only of accumulating the pressures but also of, in some way, reducing this to a ratio in terms of the ability to withstand stress. All of this, however, is in the future. The practical frustration which a mishap investigation board faces in attempting to make such assessment remains a reality.

In other instances there are certainly stresses, but they are not the result of any accumulation of quantifiable events. Rather, they are the result of an underlying temperamental quality. There are individuals who, from the accumulation of many experiences combined with emotional biological propensities, develop specific modes of behavior which almost always involve stress.

The pilot was a proud man. He was a member of an elite demonstration team. To go around when the situation became precarious would indeed have been an admission of defeat. The natural choice—make it and make it look good. The result—a destroyed airplane. Fortunately, the pilot lived.

Following one mission which had been aborted and the current mission, in which one go-around had already been made, the pilot was emotionally committed to landing at all costs. The cost was high—the landing was on a hill. This pilot also lived; others of the crew did not.

Or take the case of another demonstration pilot, also in the spotlight. The pressures were great—the expectations were high—the maneuver was aerodynamically unsound. The pilot died.

Sometimes the long-term patterns combine with acute events to create even more overwhelming situations. The pilot was an achiever. He wanted a good image—wanted to excel—and he had been doing both in his previous assignment. Currently he had not been doing so well in either his private or professional life. He had just been unwillingly divorced from a wife who had initiated the action. Although highly experienced, he had never flown a pop-up mission in an element wingman position. The second element, in which the pilot was assigned, initiated the pop-up and turned toward the target. It appeared the accident pilot was going to cut lead off, so the mission was aborted. He entered a low-speed stall condition from which he was not able to recover. How much did his personal problems contribute to this accident? We'll never know. Or how much did his need to prove his technical competence—to restore his self-image—contribute? This too we will also never know.

HE DIDN'T SURVIVE

There are other tensions that are not associated with either an accumulation of major life events or constant nagging pressure to excel above one's peers. Take, for example, the pilot who had an alleged violation filed against him in a preceding flight for an illegal climb through weather. It was not found valid during the investigation, but when the situation arose which could have been readily resolved by climbing out, he chose not to because he would be violating IFR procedures by so doing.

STRESS

continued

Did the suspicion that such a violation would bring him more unwelcome attention than he wanted have an effect on his decision? We can't ask him—he didn't survive the crash.

Or how about the case of the two crew members who had both been passed over for promotion to the next grade level? Flight lead in this operation was the ops officer. Did the desire to excel in his eyes cause them to make a steeper than normal pass, which shallowed out only just before contact with the ground? Again, it would be nice to have the benefits of a discussion with the crewmen.

The wingman looked back, saw lead moving in, looked back again and saw a ball of fire. The board determined that the pilot's proficiency in minimum altitude maneuvering was low. On the previous mission, he had had difficulty completing the attack and became lost. This fact had been brought to the attention of the mission commander, even though it was subsequently discovered that the navigation equipment had malfunctioned. Do you suppose the pilot was just not about to have that happen again?

Some other occurrences are more altruistically engendered. This crew was also pressing hard, concerned about another crew which had been lost several days following a crash. They failed to follow their briefing and attempted to fly beyond their skill and background. Human empathy would lead almost anyone to the conclusion that this violation was the direct result of a feeling of responsibility and concern.

ATTENTION DURING STRESS

If the conclusion is accepted, as it almost inevitably must be, that temperamental qualities and past emotional experiences can affect current behavior, the practical question which arises is, what can be done about it? The academic answer, which may be the best we can get, is that each individual becomes aware of the potential for degradation of skilled behavior and strives to neutralize the consequences. This can be done either by greater attention during known periods of stress, or perhaps even by avoiding certain activities entirely, at those times when the self-evaluation would indicate that the potential for influence is at a maximum. The probability that either of these things will be done, however, is not great. Even as the alcoholic, in transient moments of sobriety, resolves to avoid future involvement, so the stressed individual, in moments of calm, may make comparable resolves. But as the first drink destroys the alcoholic's resolve and his objective ability to assess the situation, so mounting stress may likewise impair the individual's ability to evaluate his potential impairment. This is a gloomy assessment, which represents the question of what can be done. If the individual cannot help himself, then help must be forthcoming from some other source. What other sources are there?

This brings into focus still another mishap, in which the pilot's father, wife, operations officer and peer companions knew of his doubts regarding his flying ability and of the vacillations that he was experiencing in making a decision to discontinue flying. There is an axiom among professional counselors which states that if an individual threatens suicide the threat should always be considered seriously, no matter how unlikely it may seem to the individual to whom the statement is made. The very fact that a normal person would consider this solution to life's problems is an indication that he or she might well implement it. Such threats are also frequently a plea for help. Likewise, the professional pilot who expresses his desire to quit a flying career always merits a careful hearing. One statement frequently heard following a mishap is, "Everyone in the squadron knew that he was the most likely one to have the next accident." This ranks second only to "He was the best pilot in the squadron."

Now it isn't really fair to put the total burden of recognizing another's problems on someone else. The fact does remain, however, that in the team military system each must be, in fact, his brother's keeper, not totally for altruistic purposes either. In the final analysis, self-preservation and the integrity of the system are ensured. Hopefully the approach so bravely undertaken by the Navy and civilian medical communities will eventually result in some quantification which will make both self-recognition and command recognition of an increased potential for inefficiency and ineffectiveness apparent. For now, however, only astute awareness by all will make possible any progress toward preventing accidents associated with psychic stress. ★

LET'S HAVE A FLY-IN

Directorate of Aerospace Safety Lt Col Robert L. Gardner

One of the most popular and effective methods of reaching significant numbers of civil aviators has been the civil aircraft fly-in.

"**A*irliner and Cessna collide over San Diego—150 lives are claimed;" "Two light aircraft run together;" "Mid-air collision between military jet and civilian plane destroys both."*** These headlines emphasize the seriousness of our crowded skies. And, according to a recent article in *U. S. News and World Report,* the situation is getting worse. For example, in the last five years the number of private planes has increased 21 percent and now totals approximately 186,000. The same report points out that government estimates indicate that the number of aircraft in the U. S. will double to 375,000 by the year 2000.

These increasing numbers reflect a continuing problem of small, general aviation aircraft, commercial airliners and military craft vying for the same airspace. Although air traffic control equipment and procedures have been improved and the FAA is studying sophisticated anticollision systems, the visual "see and be seen" method of collision avoidance remains the primary way to detect an impending midair disaster. Before you shrug your shoulders and turn the page exclaiming under your breath: "I always clear, and besides I can't do anything about those little bug smashers," hang with me a little longer.

There are some things we in the Air Force can do to reduce the midair and near-miss potential in our local flying areas. Programs to educate both civilian and military pilots of the collision threat not only reduce the midair potential but also have beneficial public relations spin-offs. One of the most popular and effective methods of reaching significant numbers of civil aviators has been the civil aircraft fly-in. Two Air Force bases who sponsored fly-ins within the past year had over 300 general aviation airplanes show up for their program. These bases considered the events a resounding success.

As with any successful project, there is a lot of planning and hard work involved. The wing commander and his staff, along with Airfield Management, Safety, Air Traffic Control, and the local FAA General Aviation District Office (GADO) must support the project and work together to develop an interesting, motivating program if the event is to be productive. Here is a list of topics suggested by one MAJCOM:

- Briefing or film on mission of the local unit and its major command.
- Visual aid briefings on local traffic patterns, high density areas, and low level training routes.
- Presentations by General Aviation District Office.
- Appearance of a noted aviation personality.
- Tours of RAPCON.
- Static displays of military and civilian aircraft.
- Tour and "flight time" in simulators.
- Aerospace physiology briefing.
- Spatial disorientation exhibit.
- Special luncheon.
- Commander's comments.
- Question and answer period.

Before committing to sponsor a civil fly-in, the following items should be considered. Is there sufficient interest in the civilian community to justify a fly-in? (Visits to local airports and contacts with civilian flying clubs, etc., can help give an input.)

Are the wing commander and his staff sold on the idea? Conduct initial planning several months prior to actual fly-in and select a specific date with an alternate in event of unforeseen problems. (Ensure there are no conflicts with other attractions which would draw the same audience.)

Review AFR 55-20 and submit necessary waiver requests to permit civilian aircraft to land at military installations. (Note: Hold harmless agreements and proof of insurance are required to be on file prior to civilian aircraft landing.)

Organize a working group with representatives from all units involved to discuss potential problems. Suggested working groups are: Operations, Arrivals/Departures group, ground handling group, promotion group, programs group, exhibits/facilities group, concessions/luncheon group, security and traffic control group, weather service group, medical services group, communications group, and transportation group.

Once the decision is made to have a fly-in, an important task is publicity. Plan big. Successful bases have distributed over 30,000 brochures. Make sure the information kits include flyers on the local flying area and training routes along with flying arrival instructions. Even those pilots who don't attend will get the word on potential hazards.

Try to keep the red tape to a minimum and make returning the hold harmless agreements and proof of insurance as painless as possible. The July 1978 *USAF Safety Officer's Study Kit* article "Awareness – A Key to Midair Prevention," provides some excellent examples of things to include in an invitation kit. A future issue of the Kit will include a detailed checklist used by Tinker AFB for their Safety fly-in. These can be obtained through your local safety shop.

The skies will continue to be crowded and although efforts will be made to separate and limit light aircraft from commercial airline routes and military operating areas, much of the air space has to be shared and used by all. A better knowledge and understanding of each other's operations just might prevent an accident. Good luck with your fly-in. ★

NEWS FOR CREWS

Information and tips to help your career from the folks at Air Force Military Personnel Center, Randolph AFB, TX.

CMSgt Dick Sanders
Air Force Manpower and Personnel Center

PRIMARY ENLISTED AIRCREW MANAGEMENT

Over the last two years, major changes in management of the enlisted aircrew members have evolved at AFMPC. Boom operators, gunners, flight engineers, loadmasters, and pararescuers are affected by these changes. Let me explain how the new process works.

The key to this new management style is known as Rated Distribution and Training Management (RDTM). Basically, RDTM is a systems concept originally designed and employed to manage our rated officer force. The RDTM process allows us to estimate requirements over a five-year period and match them against a projected inventory of rated officers in each major weapon system (B-52, KC-135, C-130, C-141, etc.). This information is then used to determine the number of new inputs that must be trained each year.

A similar analysis is now being focused on the enlisted aircrew force. A committee was formed to work these complex and vitally important issues. The committee has representatives from MAJCOM and Air Staff operations and personnel staffs and is chaired by the HQ USAF Directorate, Operations and Readiness (AF/XOO). They evaluate issues from a total force viewpoint, combining both operations and personnel considerations. Subteams within this executive committee structure are aligned by major weapon system and meet semiannually and work issues unique to their weapon system group (e.g., Strategic Airlift, or Strategic Bomber, Tanker, etc.).

Sure, all of this sounds impressive, but what does it mean to you? It has a direct impact on you – the enlisted crew member. RDTM provided the analytical tools and management guidelines to overhaul and streamline the airman assignment process. To work your assignments with full appreciation of the enlisted aircrew members' situation, we've formed career management teams at AFMPC. These teams are composed of former aircrew members with broad experience in operations. Your functional representatives understand enlisted aircrew duties because they've been there.

The functional representatives have access to all requirements for their career fields. With this "big picture," they make assignments accordingly, but not in isolation. Your assignment preferences are vital to the functional representative's effort to make the right man-job match.

The AF Form 392, Airman Preference Statement, is the primary method for you to state your assignment preferences to your functional manager. Instructions are on the back side of the form and can also be found in AFR 39-11, para 3-34. Several key points should be kept in mind when filling it out. Make it realistic and keep it up-to-date. If you want to remain at your present base, list that base as your first choice and fill in the remaining seven bases in order of preference. Since the AF Form 392 has been used, we've been able to build a good track record in matching requirements with desires. One thing is sure: chances for an assignment of your choice greatly improve when you use the Airman Preference Statement.

Effective enlisted aircrew management requires two-way communications – from us to you, such as this article; and from you to us – by letter, Form 392, and phone calls. If you have questions regarding any aspect of the personnel assignment system, please contact us. Remember – the most important element in the personnel management process is you.

AFMPC Functional Representatives

A111XO Gunner	SMSgt Timlake	MPCROR3E 487-4943/4944
A112XO Boom Operator	CMSgt Sanders	MPCROR3F 487-4953/4954
A113XO Flight Engineer	CMSgt Love	MPCROR4 487-4951/4961
A114XO Loadmaster	SMSgt Cress	MPCROR4 487-4961
A115XO Pararescue	*MSgt Keller	MPCRAW1 487-5821/5822

*The pararescue field, due to its small size, does not have a functional representative at AFMPC. Functional representation is provided at MAJCOM level with coordination through the resource manager at AFMPC.

CMSgt Sanders has been assigned to the Air Force Manpower and Personnel Center as a functional representative in the Rated Officer Career Management Branch since December 1975. Prior to his present assignment, CMSgt Sanders was assigned to Castle AFB CA as a KC-135 boom operator in the Standardization/Evaluation Section of the 93 BMW. He has 23 years experience as an enlisted crew member. ★

Mail & Miscellaneous

Send your ideas, comments, and questions to:
Editor, Aerospace Magazine
Norton, AFB, CA 92409

NOW YOU SEE IT . . . NOW YOU DON'T

Your article on page 27 September 1978 *Aerospace Safety* was a welcome addition to our midair collision avoidance education program. But who would think of flying around with one eye closed, right? Wrong!! If you really want your "eyes watered," try the same test while wearing your trusty Oxygen Mask, type MBU-5/P. The portion of the mask covering the nose will cause the same phenomenon. Just put on your mask, hold the page at arms length with the cross directly in front of the right eye and move it toward you. Even with both eyes open, that 747 will varnish every time. For those of you not fortunate enough to own an oxygen mask, try placing an index finger vertically along the "leading edge" of your nose (on the outside, please) in lieu of the mask.

So much for the bad news; now for the good news. That one-and-a-half degree blind spot moves in direct relation to head or eye movement, so keep both your head and eyes moving.

JOHN P. AMIDON, Major, PaANG
Chief of Safety
112th Tactical Fighter Group (TAC)
Greater Pittsburgh International Airport
Pittsburgh, PA

443 SQUADRON

443 Squadron is alive and well and flying the Sea King all weather, ASW Helicopter from CFB Shearwater and the helicopter destroyer fleet. We are writing our history prior to receiving our colours in the summer of 1980. Former members of the illustrious Fighting Four Hundred and Forty-Third Squadron are encouraged to submit any information and personnel anecdotes which could enliven our publication. A reunion is now being planned so keep the summer of 1980 open and please send your name and address to be put on our mailing list. Send to:

Commanding Officer
443 Helicopter Anti-Submarine Squadron
Canadian Forces Base Shearwater
Shearwater, Nova Scotia
Canada
BOJ 3AO

WHAT IS SAFE FLYING?

Captain George R. Jackson
43d Strategic Wing/SE

Fly Smart, Stop—Think—Collect Your Wits, Know the Limits of Your Aircraft—We have all heard these "safe flying slogans" many times; but people still ask me," What is safe flying?"

I can't answer this question for every person on every occasion, but I do have a basic safe flying philosophy—*Don't Exceed Your Envelope.*

We have volumes of information that adequately describe the aircraft envelope, but what about the crew member's envelope? That envelope is known by one person only—the individual crew member.

The wing staff knows your past record, and can use it to predict the future; but only you feel and react to the immediate situation. You alone know the anxiety and tension of each event during the mission. When you feel these pressures, it may be your personal envelope closing in; and then it's time to change the situation.

What do I mean by change the situation? Let me illustrate. Several years ago a pilot flew a B-52 into some trees during a rainshower. During the approach, he felt some anxiety concerning his aircraft control and the weather, but he pressed on. A tragedy was only a few feet away before he made the go-around.

I think we all remember the terrible incident in Florida when a young aircraft commander tried to land a 400,000 pound airplane with two engines on fire. Why couldn't he get the aircraft lined up with the runway? Why did he get into [illegible] impossible go-around situation, it seems clear that the pilot felt the pressure (perhaps pressure from *his* envelope shrinking), but he didn't or couldn't change the situation.

Through study and practice you can expand your envelope to include more situations. Utilize the tools that your squadron makes available—flying safety magazines, training flight personnel, hangar flying, and all the rest. Make sure you get all information from the crew who had the most recent emergency, and be sure you get the word out on your own inflight problems.

Finally, don't be overcome by events. Stay within your envelope; don't press to test your limits unnecessarily. If you think you are getting into trouble, don't worry. You are already there. Fly saf[illegible] within your envelope. ★

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 Accident Prevention Program.

Upper L—Capt Matthew W. Earl, Jr., R, SSgt John L. Christopher. Lower—L to R, Capt Norman C. McCaslin, Capt Kenneth L. Stroud, MSgt Carl D. Graham, MSgt Richard A. Roberts.

CAPTAIN
Matthew W. Earl, Jr., and Crew

11th Tactical Drone Squadron (TAC)
Davis-Monthan Air Force Base, Arizona

On 24 February 1978, while performing a full functional check flight of a DC-130A aircraft at 17,000 feet, the crew heard a loud "boom." Master Sergeant Roberts checked the cargo compartment and reported the internal fuel tank had imploded and fuel was streaming into the cargo compartment. The crew immediately went on oxygen and performed appropriate emergency procedures. Immediate realization of the danger of having the fuel run forward in the cargo compartment where the electrical racks and the transformer rectifier unit are located prompted Captain Earl to establish a nose-high attitude to allow the fuel to flow toward the back of the aircraft. Master Sergeants Graham and Roberts opened the escape hatches to allow flow-through air circulation to remove explosive fumes from the aircraft. Then they improvised soundproofing material around the leaking tank to slow down the fuel flow. To avoid any type of electrical sparks, radio and interphone communications were cut to an absolute minimum and all switches on non-essential electrical equipment were left untouched. An uneventful landing was made with all crewmembers safely egressing the aircraft. The superior airmanship, prompt reaction to this serious in-flight emergency, and the professional competence demonstrated by the crew resulted in the saving of a valuable aircraft with no injuries or loss of life. WELL DONE! ★

Things that go THUMP in

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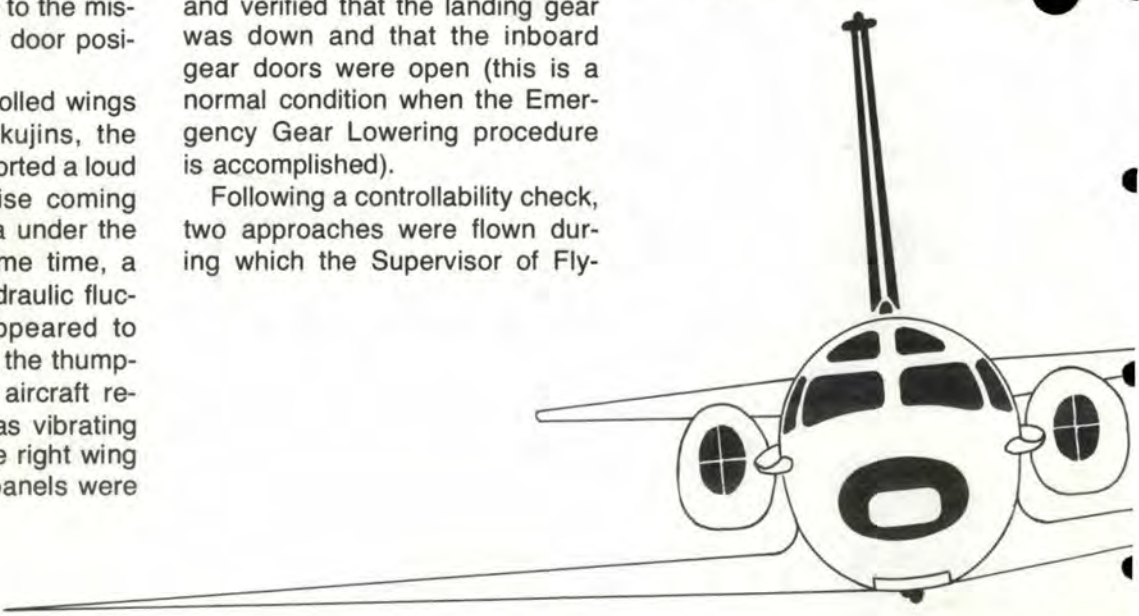
THUMP

During a recent aero evaluation mission on a T-39B, some events occurred that had both the flight crew and ground support personnel scratching their heads for several rather exciting minutes. The first hour of the second mission was uneventful, but then the problems began. At 350 KIAS (red line airspeed) in a level 2G turn, a steady red light appeared in the gear handle. This condition indicated a gear in-transit status. The flight crew, Capt Lee Singer and Capt Tom Clapp, of the 4950 Test Wing at Wright-Patterson AFB, Ohio, began slowing the aircraft to 180 KIAS (gear limit speed) and asked the F-100 chase aircraft assigned to the mission, to verify the gear door position.

As the aircraft was rolled wings level, Ms Margaret Skujins, the flight test engineer, reported a loud rhythmic thumping noise coming from the aft cabin area under the cabin floor. At the same time, a rapid +/− 500 PSI hydraulic fluctuation began that appeared to cycle in sequence with the thumping noise. The chase aircraft reported that a panel was vibrating on the underside of the right wing root and that several panels were missing from the engine nacelles and aft section of the fuselage. The crew turned the T-39 towards WPAFB, coordinated an immediate return to the field, and requested that the chase aircraft accompany the T-39 on its return for landing.

As the aircraft speed continued to decrease, the frequency of the thumping noise diminished slightly but the magnitude of the hydraulic pressure fluctuations increased. The crew decided to follow the Landing Gear Emergency Lowering Checklist in response to the red light in the gear handle, but they were still unsure of the cause of the hydraulic fluctuations and the thumping noise, although all the symptoms appeared to be related. When the gear was lowered the red light in the gear handle went out, the three green "gear locked" lights came on and the thumping noise and hydraulic fluctuations ceased. The F-100 again closed and verified that the landing gear was down and that the inboard gear doors were open (this is a normal condition when the Emergency Gear Lowering procedure is accomplished).

Following a controllability check, two approaches were flown during which the Supervisor of Flying and a T-39 systems expert inspected the aircraft and found no damage or missing panels. However, following an uneventful landing when the aircraft was placed on jacks, with hydraulic power applied, the cyclic thump-



THUMP
THUMP
THUMP

the flight

ing occurred along with a corresponding one-inch up and down movement of the right main gear door. This probably explained the vibrating panel reported by the chase pilot. The right main gear door switch was found to be internally defective causing a repeated open and close signal to go to the gear door system. This caused the hydraulic fluctuations and the cyclic thumping noise. Apparently, a combination of high airspeed and acceleration forces produced conditions that started the malfunction. A thorough inspection of the airframe revealed that the missing panels that were reported by the chase aircraft pilot were, in reality, louvers and other normal openings on the engine nacelles.

Two important lessons were learned during this incident: First, ensure that the chase pilot knows what the aircraft that he is observing is supposed to look like. Next, when faced with several conflict-

ing and confusing indications, the crew decided to correct the one known malfunction that could identify the problem (the gear handle light). Moral: Don't become so confused by numerous malfunction indications that you fail to correct what can be controlled. You may get lucky and cure all the problems at once. ★

NO ROOM FOR COMPLACENCY

Sophisticated flight and navigation equipment are only aids to the pilot. Now more than ever a pilot must be true to his responsibility as an aircraft commander.

Years of experience teach a pilot so many things that a catalog of them would fill volumes. However, certain general topics emerge which can be discussed in a few paragraphs.

Beginning with "A," for no particular reason, we think of "alertness." Whereas a pilot's attention used to be focused on keeping the wings level, maintaining altitude and course and "keeping his head on a swivel," now the autopilot flies the airplane and radar controllers point out traffic. We hope. Is hope enough? Not enough for a full-time professional. He spends his time monitoring instruments and looking around, not reading.

Being constantly aware of exactly where one is in relation to airways, outer markers, airports and most important, the ground, is another form of alertness. In these days of almost continual radar vectoring, complete reliance on an outside agency for navigational guidance is the easy way, but it can lead you down the garden path or up the proverbial creek. It is not the professional way. Healthy skepticism of a radar controller is not an insult to his ability; it is a tribute to your professionalism.

The responsibility shouldered by a pilot when he departs on a flight is awesome. Acceptance of responsibility these days is unusual. Thus the pilot becomes unusual. People expect more of him. This becomes an additional responsibility to conduct himself at all times in a way that is a credit to him and to his colleagues, in a way that moves people to look up to him, not sideways, or even down. His high professional standards should be carried over into his personal standards. In a job that is of necessity largely unsupervised, his personal integrity must be unquestioned. Cheating should never occur to him. His reports of "on, in, out and off" times should be just as precise and exact as his ILS approach with 1800 RVR. The pilot who doesn't meet these standards damages his own reputation and those of his colleagues.

A cockpit organized along highly professional lines will never have room for complacency.—Adapted From North Central Airlines *The Ungarbled Word.*

☆U.S. Government Printing Office: 1978—683-011/2

ANNOUNCING

THE PROFESSIONAL APPROACH

Air Force Communication Service, Scott AFB, IL

Do you have a question? Do you have a war story? Do you have anything you would like to share with other aircrews pertaining to instrument flying, criteria development, instrument procedures interpretation, NOTAMS, or flight information publications? Professional Approach is a new article designed to address these questions. But, we need your inputs to get this article out of the chocks. You, the operators, are the only ones who know what the current problems really are. So, if you would mail or call in problems, innovations, etc., we will write our articles accordingly. Our article may feature future NAV systems or a series of questions and answers or a potpourri of topics. Our foremost concern is to provide coverage in those areas that are most meaningful to you, the reader. So help us get off the ground by identifying those problems, questions, ideas, experiences or comments you may have. Fair enough? Don't hesitate, pick up the phone and tell us what you would like us to address. Better yet, write us a letter. We can be contacted at AFCS/FFOS (Flight Standards), Scott AFB IL 62225 or AUTOVON 638-5479, Commercial 618-256-5479. You can also find our address and phone number on the inside front cover of the FLIP (Enroute) IFR–Supplement.