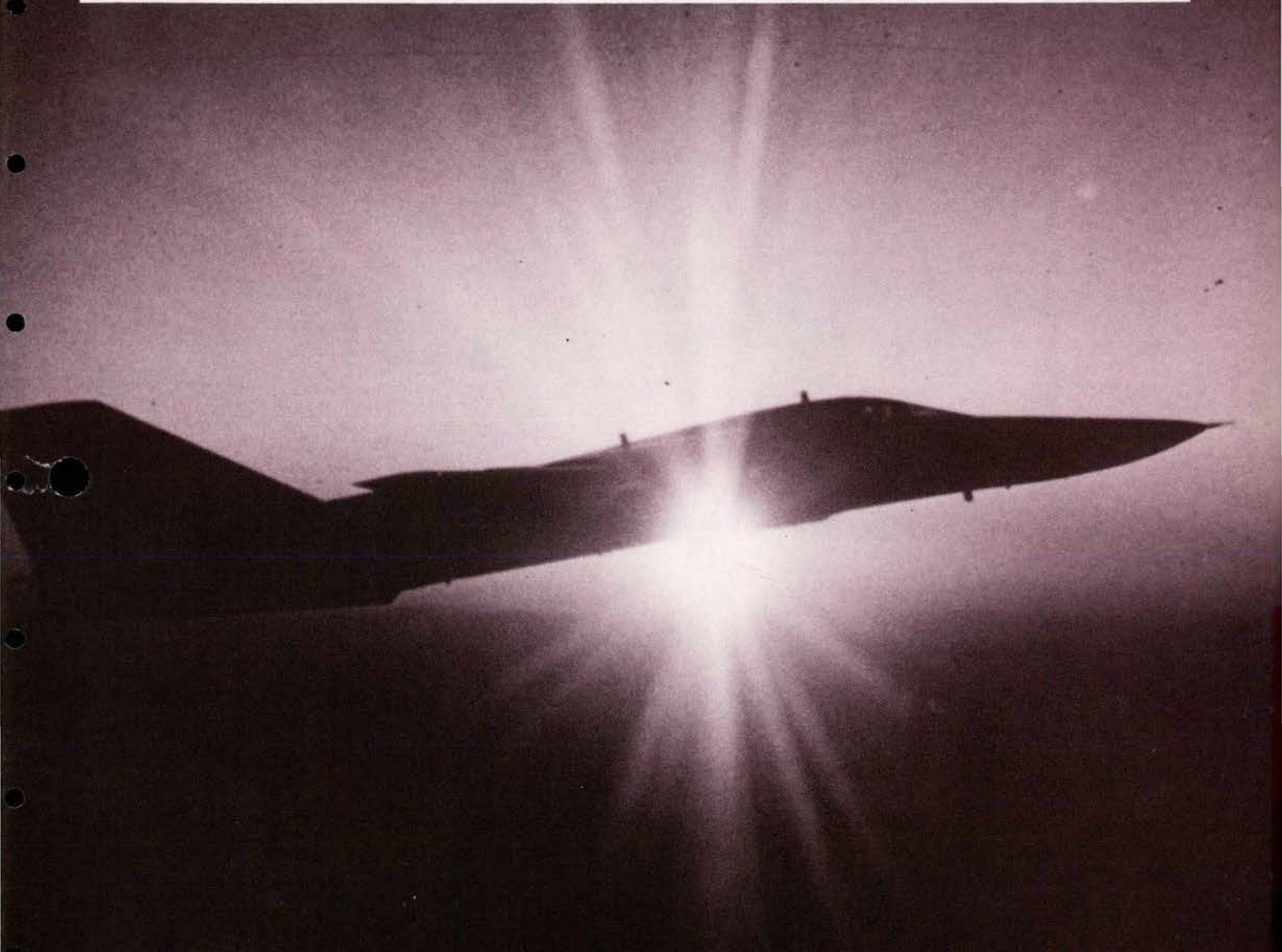
AEROSPACE

SAFETY • MAGAZINE FOR AIRCREWS FEBRUARY 1979



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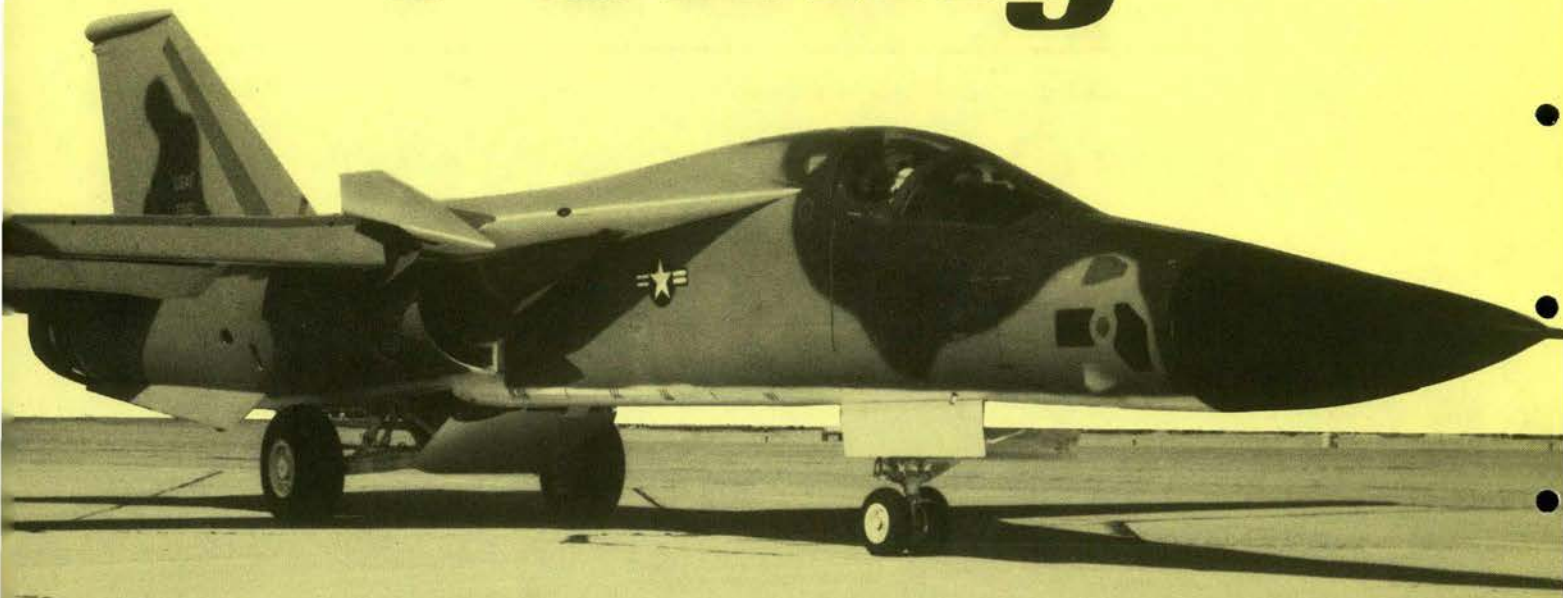
FODing



THE F-111

Major Eugene LaMothe • Directorate of Aerospace Safety

In the past 2 years more than 80 TF30 engines in F/FB-111 aircraft were damaged sufficiently by foreign objects to require removal and repair. The cost was over $2 million, but equally important is the additional workload placed on the engine community. One of the limiting factors in F-111 sortie production during this time period was lack of engine availability due to the large number of TCTOs in work. The additional burden imposed by foreign object damage further limited the number of spare engines available and delayed the overall recovery program. This article will review F/FB-111 foreign object damages causes in the belief that we can learn from past mistakes.

There are three paths that foreign objects take to reach an engine in the F/FB-111. The most obvious is the primary air intake that everyone respects and stays well clear of. Auxiliary air inlets (blow-in doors and translating cowls) provide a second path that is not as obvious and this may help explain why so many foreign objects enter through these inlets. Boundary layer air louvers on top of the aircraft allow small objects to reach the spike system and drop into the intake. Each of these foreign object paths presents unique problems in FOD prevention.

AUXILIARY AIR INLETS The large number of foreign objects that have been ingested through these inlets indicates personnel working around the aircraft are not sufficiently aware of the hazard they represent. It appears no one is immune to being surprised by the amount of air entering these inlets. In 1971, the first of 11 head-

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SPECIAL FEATURES

REGULAR FEATURES

DEPARTMENT OF THE AIR FORCE • THE INSPECTOR GENERAL, USAF

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TABLE I

F/FB-111 aircraft have experienced 240 reportable instances of foreign object damage since entering the inventory 10 years ago. In 113 of these, the objects causing the damage were identified and this information is summarized in Table 1. The numbers with asterisks represent incidents where the foreign object reached the engine through the auxiliary air inlets. The continuity in some of these columns indicates we haven't learned too well from past mistakes.

SUMMARY OF F/FB-111 ENGINE FOREIGN OBJECT JAN 1968 - NOV 1978

HEADSETS	GEAR/ TAILHOOK PIN	WEAPONS PINS	ICE	COMM CORD/ GROUND CABLE	OTHER ITEMS WITH THREE OR MORE FOD OCCURRENCES
* Jun 71	* Sep 71	* Jan 72	Mar 74	Sep 72	23 Fasteners
* Mar 73	Jul 72	* May 72	Mar 74	* Aug 74	3 Tools
* Mar 73	* Sep 72	* Jan 73	Mar 74	Dec 74	3 Intake covers
* Dec 73	* Feb 73	* Jun 73	Dec 76	Mar 76	4 Screws
* Sep 74	* Apr 73	* Jul 73	Dec 76	* May 76	3 Birds
* Apr 75	* Mar 73	* Feb 74	Jan 77		4 Bolts
* Mar 76	* Jun 73	* May 75			3 Pieces of spike system
* Aug 76	* Apr 75	* Aug 76			3 Engine blind bolts
* Oct 76	Jan 76				3 Rivets
Sep 77	* Feb 76				22 Miscellaneous
* Oct 78	* Aug 77				113 Total known objects
	* Dec 77				127 Unknown objects
					240 Grand Total

FODING THE F-111

continued

sets that have been ingested by F-111s was lost by a supervisor of flying. He was checking the aircraft for hot brakes when his flight hat and ear defenders were snatched from his head. Objects have been lost by crew chiefs

The crew chief had installed the speedbrake collar in preparation for engine shutdown and was exiting the wheel well with the tail hook pin in his hand. He tripped on the main wheel chock and when he raised his hand to stop his fall, the engine sucked the pin from his hand through the middle blow-in door.

And engine shop personnel

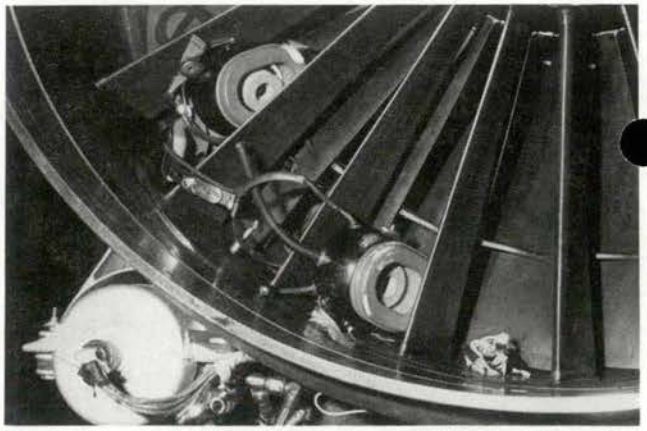
An engine specialist, while exiting the wheel well area during the military rpm check of an engine trim operation, lost his headset and wool cap through the blow-in door of the left engine.

Who should have been aware of the hazards associated with these intakes? Other flight line personnel, such as munitions handlers

The aircraft was ground aborted and the weapons were being dearmed when two munitions personnel collided while passing each other between the intake and pylon station four. One airman dropped a BRU mechanical safety pin which was ingested through the open translating cowl.

And environmental technicians

Aircraft was being run at military power for an operational check of the heat exchanger and cooling turbine systems. The environmental mechanic attempted to enter the main wheel well to leak check the system when his arm was drawn into the translating cowl opening. Two other personnel were able to pull him free, but were unable to prevent his headset from being ingested into the engine.



It took two men to safely pull the environmental mechanic's arm free from the suction through the translating cowl opening, but his headset wound up here.

have contributed to the problem. Transient alert personnel at a cross-country base weren't aware of the hazard:

A transient alert crew chief installed a grounding wire on the number four pylon and left the area to assist in parking two other aircraft. The remaining crew chief, who had not seen the ground wire being installed, requested the wings be swept to 72 degrees to make more room on the ramp. During engine shutdown, with the wings swept, the grounding pin and wire were

sucked into the engine through the blow-in doors.

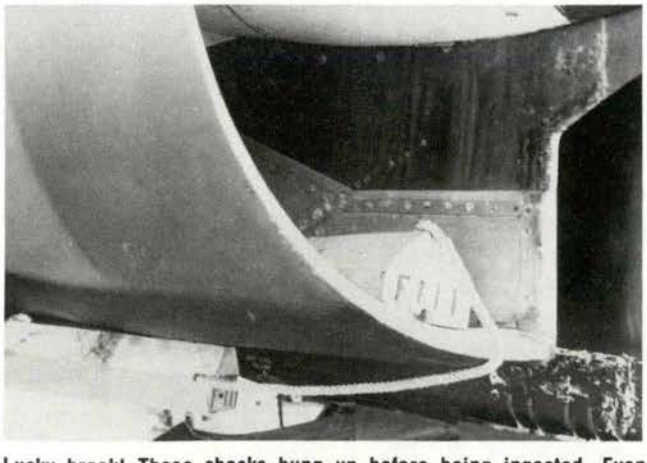
Each of these instances points to the need for a continuing education program that ensures everyone who goes near an F-111 with engines running has the same respect for auxiliary intakes as they have for the primary intakes.

PRIMARY INTAKES Watch an F-111 with engines running on a humid day and you'll see the vortex of air that extends from the lower lip of the intake to the ground. The intensity of this vortex varies directly with engine rpm and early testing indicated it would not pick up objects from the ramp. An aircraft run at military power over cornflakes and other light objects on the ramp failed to ingest any. This testing did confirm, however, that any object above the ground caught in the vortex would tend to be sucked down the intake. This may help explain why some objects such as gear pins and communications cords have been lost in this manner.

Before the left engine was shut down, the assistant crew chief dropped the main landing gear pin. The wind caught the streamer, dragging it toward the left engine, and before it could be retrieved, the pin was sucked into the left engine.

During a check for afterburner light with left engine at 100 percent, the ground crewman's communications cord was wrapped once around the main gear lateral beam and the remainder was lying on the ground. As the crewman was recording readings, the cord was ripped from his hand, disconnected from his headset, and ingested by the engine.

There have been reports of communications cords dancing on the ramp below the inlets of engines that were running, but the most unusual incident involved a set of



Lucky break! These chocks hung up before being ingested. Even so, they were too close for comfort.

chocks. Fortunately they only made it as far as shown in the accompanying photo and no damage was done. They were picked up from the ramp as the aircraft was being marshalled in the arming area. The engine power setting

This area can be like one huge vacuum cleaner. Just one split second of inattention can spell FOD.

was near idle at the time.

There are many different sized fasteners securing panels on the F-111. These fasteners have been blamed for engine damage in 23 cases and implicated numerous other times. Problems start when the required fastener may not be readily available and "one that fits" is substituted. Now the "one that fits" may look okay, but if it is too long, it may damage the receptacle and eventually work out or, if too short, will not have proper thread engagement and work out. Torque values are specified for these fasteners to preclude receptacle damage and ensure security. Fasteners securing high use panels such as electronic equipment bays may wear out precluding proper torquing. Any of these conditions can and have led to fasteners coming out in-flight and damaging an engine.

Help is on the way to end some of the confusion associated with using the proper fastener in the form of TO IF-111A-2-2-1-1. It is at the printer and should be distributed early this year. It will provide a one-source easy reference for flight line personnel to determine correct fastener size and torque value. The pocket sized format is designed for ready reference on the flight line. (See page 4.)

A problem with hydrogen embrittlement of fasteners, causing them to break in service, should be corrected by this time. Suspect fasteners were purged from the supply system and replaced with hardware manufactured by a different process. Only one manufacturer was involved and his current product has an "O" or "OO" stamped on the head to identify the improved production fastener. The kicker is that one batch of fasteners recently arrived at an F-111 unit containing items that were supposedly removed from the inventory. Have you checked the fasteners you're using lately?

SPIKE CHIMNEY Spike "Chimneys" provide the third path foreign objects have for reaching the engine. They enter through boundary layer air exit louvers on top the aircraft and work their way into the spike area. Objects are difficult to see in this area and may remain in the spike for years before falling into the intake. They may work loose through normal airframe vibration or by spike

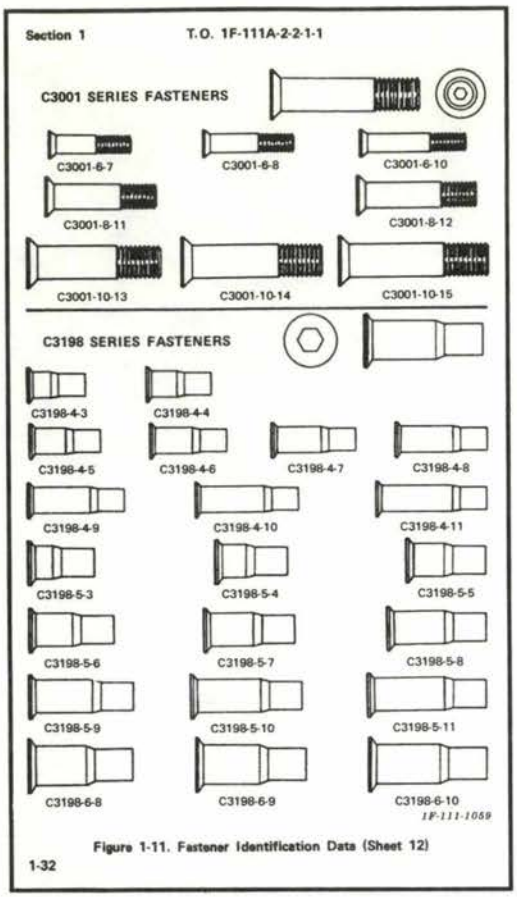


Figure 1-11. Fastener Identification Data (Sheet 12)

1-32

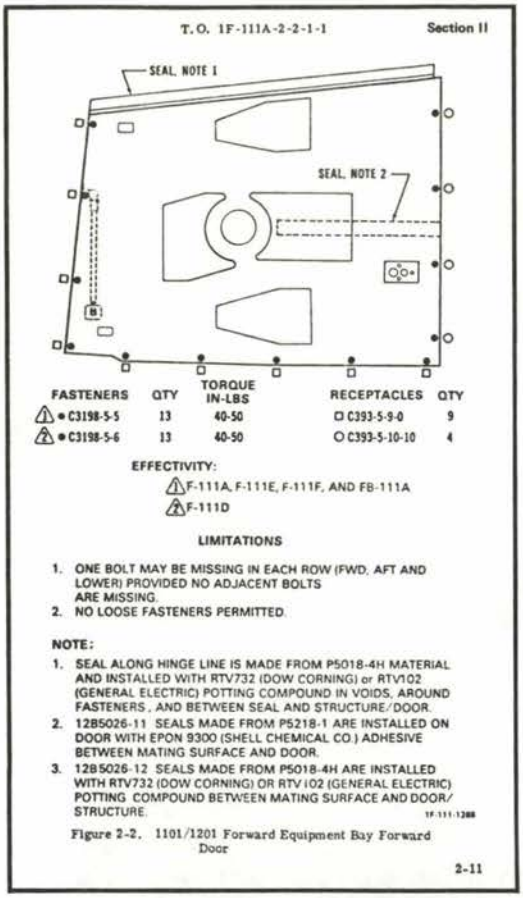


Figure 2-2. 1101/1201 Forward Equipment Bay Forward Door

2-11

These two pages are from the new T.O. IF-111A-2-2-1-1. The T.O. contains illustrations of every panel on the F/FB-111 and the correct fasteners, receptacles, and torque values to secure each panel. In this example, the forward electronics bay is held closed by 13 fasteners. The F-111D uses size 5-6 whereas all other models use size 5-5 and the four receptacles used along the forward edge differ from the remainder. Torque value in all cases is 40-50 inch pounds. The T.O. also contains a full size shadow diagram of all fasteners used on the aircraft. These can be used to verify the correct size of fasteners in use. Figure 1-11 shows the actual size of the C 3198 5-5 and 5-6 hardware used to secure the forward electronics bay.

operation at supersonic speed. Objects entering via this route are hard to trace, but this example is typical:

> **Engine most probably ingested a fastener during pilot engine ground run prior to takeoff. A 4-inch scratch below the left engine spike indicated the object came from behind spike during ground spike check as aircraft did not reach spike speed during FCF. Additionally, marks matching above fastener were found on spike upon removal from aircraft.**

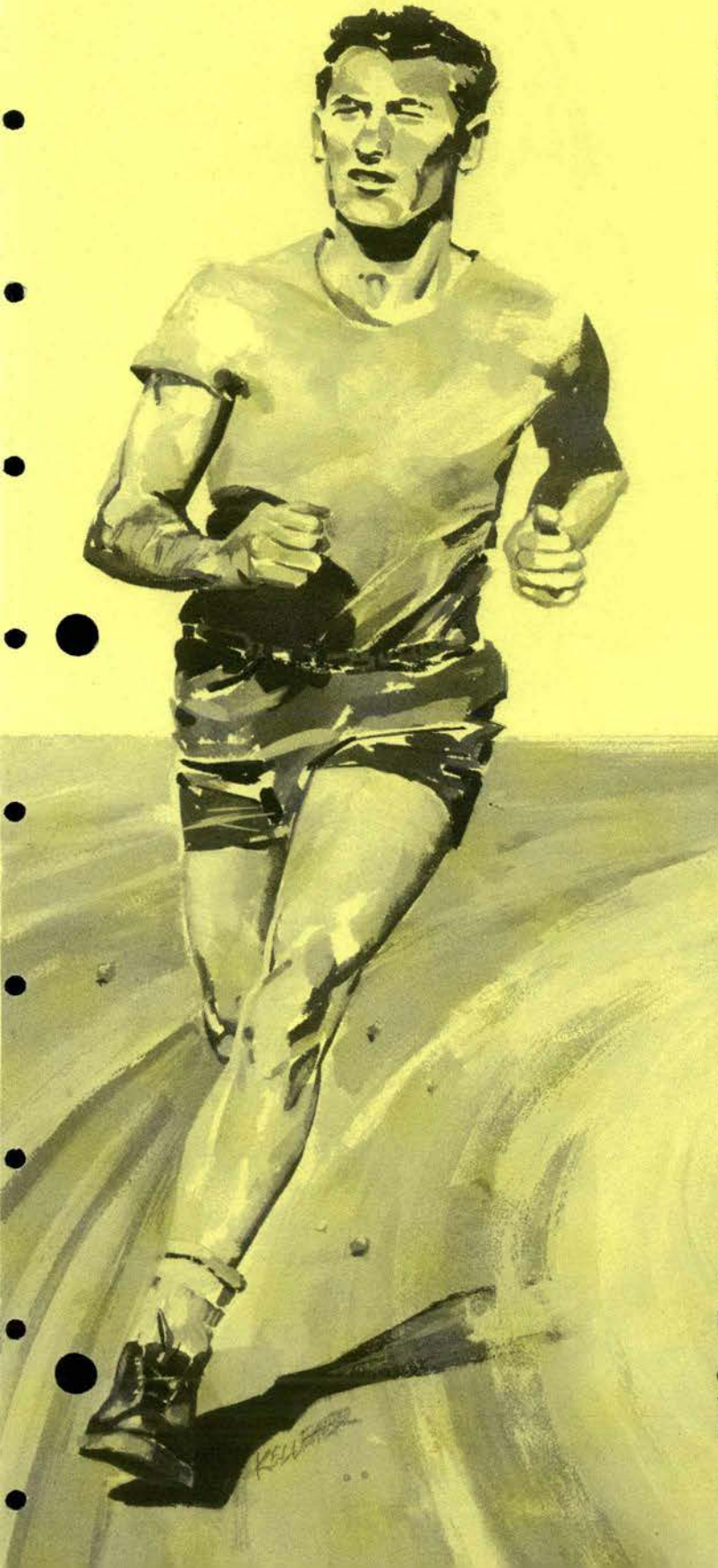
Spike X-rays help detect objects in this area but there are sealed compartments in the spike that contain foreign objects which will never be released. Confusion results in trying to identify objects that are free to be released. The answer is to prevent the initial entry of foreign objects through the use of louver covers any time personnel are on top of the aircraft.

Everyone associated with the F/FB111 aircraft should be aware of the three entry paths foreign objects use to reach the engines. This requires a continuing education program on the importance of using correct fasteners, louver covers when working on top of the aircraft, proper control of communication cords connected in the wheel well, and finally, the hazards associated with the high velocity air flow through the auxiliary air inlets. Historical data show it will only be a matter of time before another headset is ingested. Who will lose it? Hopefully not you after having read this.

Editor's Note: A great deal of effort has gone into reducing the F/FB-111 engine FOD potential. Put your unit's program on paper and mail it to the author at AFISC/SEFF, Norton AFB, CA 92409. He will compile the responses for distribution to all units operating and maintaining the aircraft. ★

FITNESS QUIZ

Colonel Richard B. Pilmer, USAF, BSC
Chief, Physiological Training
USAF Regional Hospital Shaw
Shaw AFB, SC



What shape are you in? Helleva ( ), Good ( ), Absolutely Fantastic ( )? In case you don't know for sure, take five and find out. This little test will give you a pretty good idea, but it will not substitute for the advice of your flight surgeon.

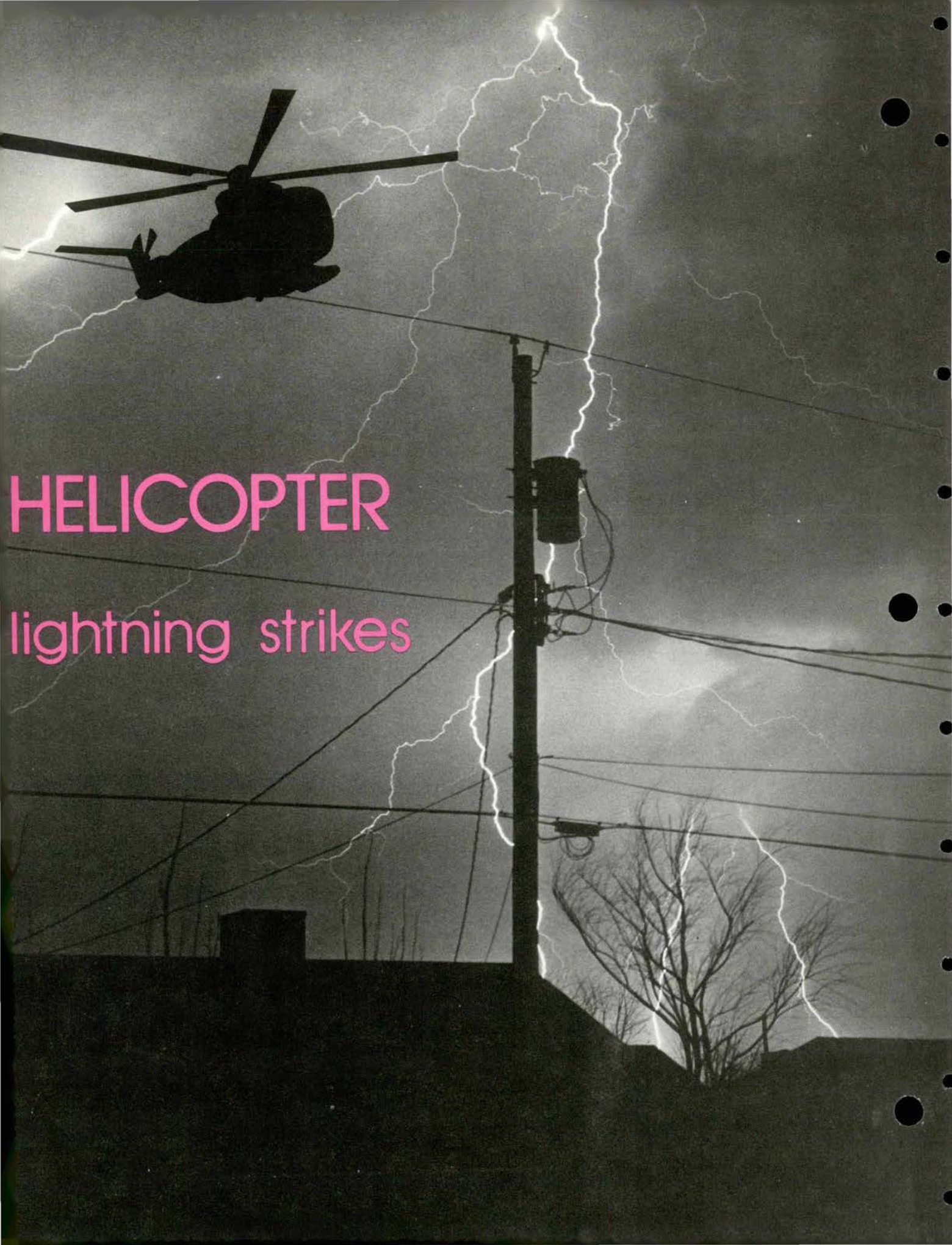
Aircrew Five Minute FIRST AID and SURVIVAL SELF-test.

1. What is the normal respiratory rate for a person at rest?
2. What is the average heart rate for humans while seated?
3. About how long can individuals in good condition (without hyperventilating) hold their breath?
4. In CPR (Cardio-Pulmonary-Resuscitation) what is the ratio of delivered lung inflations to chest compressions?
5. If your car or aircraft broke down in an unpopulated region, how would you attract attention?
6. When exposed to a loud noise, how would you protect your ears without plugs or muffs?
7. If a person were told by a flight surgeon that excessive breathing was causing hyperventilation, what should he or she do?
8. If normal muscular contraction depends on a chemical transmitter substance, acetylcholine, and nerve gas causes a net overabundance of this substance in the body, what are the symptoms of nerve gas inhalation?
9. How could you illustrate that the eyes are necessary for normal orientation of the body in certain body positions?
10. Which vitamin has a proved minimum established daily dose for maintenance of optimum health?

EXTRA CREDIT:

Which two questions are most related to a method of determining your physical condition without a treadmill or without jogging for a mile and one-half?

For correct answers, turn to page 26. ★


HELICOPTER
lightning strikes

The assumption that lightning hazards for fixed wing aircraft are the same as those for rotary wing aircraft is not entirely correct. Due to somewhat different operating environments and complexity of systems, the hazard of a lightning strike to a helicopter can be much greater.

CW4 Phillip D. Pettit
U.S. Army Aviation Center

Lightning strikes to helicopters are increasing each year because of the large numbers of helicopters in use and the number of hours flown. Fortunately, the damage is usually minor and has not resulted in a major maintenance problem. Occasionally, though, damage has been severe and at least one confirmed catastrophic helicopter lightning strike has been recorded by the USAF. The potential for damage is also being increased with new nonconducting skin materials and rotor blades such as fiberglass and special materials to reduce radar and infrared signatures.

DESTRUCTIVE POTENTIAL

Lightning ranges from 1,000 feet to 100 miles in length, with the most common type about 1 mile long. The energy content of a typical stroke is about 400 million horsepower (hp). Lightning striking the earth each day generates 3,456 trillion hp—enough to lift to a height of 100 feet a weight equal to 200,000 aircraft carriers. The return stroke, the visible part of lightning, travels at 100,000 meters per second and has a temperature of 50,000°F., five times hotter than the sun's surface.

Contrary to appearances, lightning is not a simple flash, but a complex series of events. The tremendous potential (10-100 million volts) that builds up is strong enough to ionize the air and develop into a chain reaction. A zigzagging ionized path called the stepped leader is formed. The leader zigs or zags about 50 meters in each step, pausing about 50 millionths of a second as it forks at each step seeking areas of potential difference.

With each step the cloud charge is effectively lowered, increasing the strength of the electric field between the leader and the ground. This greatly intensified field causes streamers of positive ions to spring from trees or other projections and travel upwards to meet the downcoming leader. As they make contact, the leader is neutralized and the ground charge flows back to the cloud, creating a current as high as 200 thousand amperes. This current is called the return stroke and is responsible for the bright flash and noise associated with lightning.

WHY DOES LIGHTNING STRIKE AIRCRAFT?

This is a question which to date has not been answered to everyone's complete satisfaction. The most prevalent authoritative opinion is that aircraft are struck only when they happen to pass near the natural stroke path of lightning.

This concept, illustrated by figure 1, theorizes that, as an aircraft flies near a charge center or advancing leader, the electrical field induced around the aircraft may be intense enough for streamers to form and travel out toward the leader or charge center. As the aircraft field increases in intensity, the leader advances toward the aircraft and joins a streamer emanating from the aircraft extremity. Since the aircraft will not absorb the charge, it becomes the next step and streamers emanate

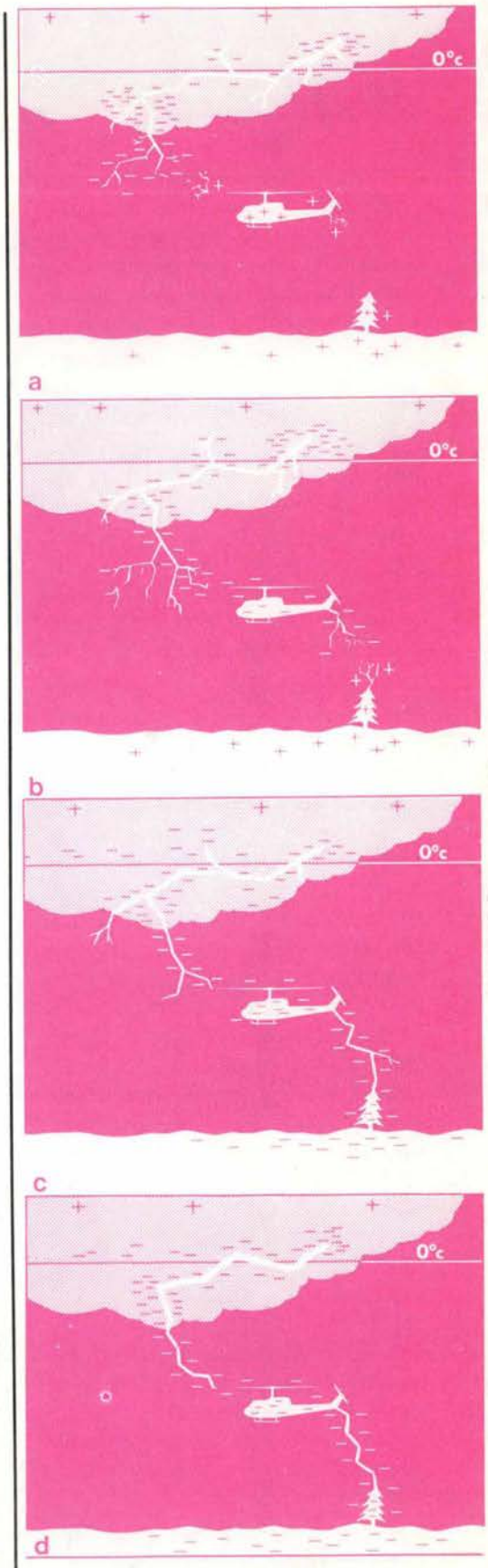


FIGURE 1.—Strike Sequence

Helicopter lightning strikes continued

from other extremities as the leader progresses to the next step. As the stroke joins the ground streamers, the aircraft becomes a link in the conductive path until the charge dissipates.

Statistics on lightning strikes seem to show that altitude plays a minor role in determining the likelihood of being struck. Recent reports show lightning strikes to fixed wing aircrafts as high as 37,000 feet with most occurring below 20,000 feet. Reports on rotary wing aircraft show strikes from a height of 9,000 feet to as low as 100 feet, with the majority occurring below 6,000 feet.

Although height and temperature are naturally correlated, studies of lightning frequency as a function of temperature and height show a strong tendency for strikes to occur in the 0°C zone. The preponderance of strikes near the freezing level must be related to the fact that the negative charge center is also found near this temperature and altitude. Another important reason for the greatest number of strokes near the freezing level is that the negative charge is not located at a single point, but is spread out with varying densities over a large volume. Indications are that lightning strokes do not follow a simple straight line vertical path from the negative region to ground or between the negative and positive areas. Instead, the discharge travels more-or-less horizontally through much of the negatively charged region before turning up or down. Thus, an aircraft flying near the freezing level would be more likely to intercept a stroke than would an aircraft operating well above or below the 0° C isotherm.

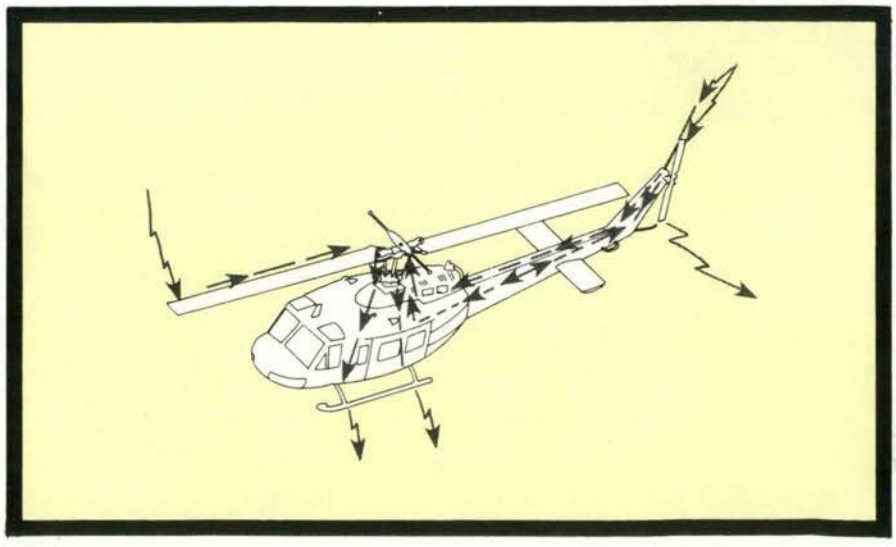
Helicopter operations conducted at lower altitudes and below the freezing level are endangered only by cloud-to-ground strokes. The relative frequency of cloud-to-ground strokes and chances of a helicopter strike depend upon the severity of the storm and its height above the ground. Even with increased IFR operations by helicopters, there has been no significant increase in lightning strikes while in clouds. All of the Army helicopters hit by lightning while in flight were operating at low altitudes, below the cloud level, and in the vicinity of developing thunderstorms. Data available from other services indicate similar experiences with a few exceptions.

EFFECT ON AIRCRAFT

Although the effects of a helicopter lightning strike can vary, in most cases the damage will be minor. No injuries to occupants of helicopters struck in the air have been recorded. In most instances, crew members reported a bright flash accompanied by a dull bang, with no adverse control problems or major electrical malfunctions. The greatest danger is major damage inflicted and associated with minor-appearing visible damage to structural members.

The danger of a fuel tank explosion is remote even though the JP-4 fuel-to-air explosive mixture is in the region of greatest lightning strike frequency. The primary hazard is a direct puncture of the fuel cell wall, but this is not likely since fuel cells are enclosed and protected by the metal fuselage. Hot spots developing on the fuel cell walls from the current flow would be extremely rare.

The usual approach in analyzing problems of lightning strikes is to determine the points of an aircraft which are most likely to be struck. Generally speaking, these points on a helicopter are the tip of the main rotor and the tail rotor pylon with an occasional ground strike through the landing gear. Figure 2 shows these entry points and exit paths. A typical main rotor strike originates with an attachment at the tip of the main rotor blade, then travels through the main rotor blade to the rotor head where the charge divides. Part of the charge arcs over to the pitch change links,



down control linkages and supports to the airframe. The charge exits through the landing gear to the ground or through the tail boom, exiting the tail skid. The other part of the charge travels down the mast into the transmission, through transmission mounts into the airframe, and exits through the landing gear to the ground.

Further analyses indicate that strikes in the tail boom pylon area begin at the tip of the tail rotor or whip antenna and pass through the tail rotor, tail rotor gearboxes, and along the drive shaft into the transmission case. The charge travels up the mast to the main rotor, back down linkages, through the transmission case to the airframe, and exits the skids to the ground.

Lightning strike evaluations of helicopters indicate that the degree of damage depends on the magnitude of the charge and point of contact. The following general observations can be made based upon the findings from 12 Army helicopter ground/air strikes and available data from other services.

- Lightning strike characteristics are different from other forms of damage since arcing erosion and pitting are easily defined from physical gouging, denting, and sand erosion normally encountered. Also, the damage caused by air strikes and the damage caused by ground strikes have the same characteristics in relation to severity and cannot usually be differentiated.

- Main rotor blade evaluations indicate that even though there is some arcing and localized skin separation, catastrophic failure is remote. Heat damage could possibly be more severe than observed due to annealing of the material surrounding the damaged areas. Most skin damage is molten pitting and skin separation is confined to the trailing edge near the blade tip. Skin separation near the blade tips may result in a deformity that would produce vibrations and possibly control problems if prolonged.

- Tail rotor assemblies that are initiating points of strikes sustain arcing and skin damage very similar to main rotors. Arcing damage frequently penetrates the leading edge but does not usually extend into the core of the blade.

- Lightning strikes in the vicinity of whip antennas on either the top or bottom of helicopters usually result in severe damage to the antenna sections. Antennas subjected to a strike will usually shatter, but in most cases the associated avionics equipment protected by lightning arrestors continues to function with no damaging effect.

- Bearings, bearing sleeves and races, rod ends, bolts, yokes, and parts with any type of spark gap that are in the path of the charge generally receive arc burns and pitting. These parts, when checked, usually meet only slight resistance and give no indication of seizure. Arc burns and pitting should be cause for rejection since this would constitute abnormal wear and possibly lower fatigue life due to annealing.

- A high degree of residual magnetism will be prevalent throughout the airframe and component parts. Ferrous particles attracted to bearing cages or races may cause abnormal wear and early failure. Most components would be unaffected after normal degaussing procedures.

- Areas of major hidden damage are usually associated with minor-appearing visible or external damage. In most cases, no hidden damage will be found without visible damage of some kind.

SUMMARY

Lightning strikes to helicopters are usually cloud-to-ground strikes occurring at low altitudes. Because of the greater hazards of strikes at temperatures near 0° C, efforts should be made to avoid operating in the vicinity of heavy thunderstorm cells when these conditions exist. Careful planning and study of weather reports should help in circumnavigating these areas and avoiding other problems associated with thunderstorm activity.

When occasional lightning strikes do occur, usually there is little or no major structural damage or extensive arcing burns and pitting. The possibility of a catastrophic failure when main or tail rotors are struck is minimized by the design and strength of the blades. Structural integrity and control will normally not be insurmountable even though there may be partial skin separation of damaged areas and burns to the blade surfaces. Rotating controls and bearings, although subjected to pitting and burns, usually continue to perform as designed and as a rule have not presented any problem during air strikes.

The fact that lightning strike damage can be much more severe than visually observed is cause for immediate action. It is conceivable that lightning strike hidden damage could be so severe that a critical component fatigue life might be reduced to a few hours or even a few minutes. Should a strike occur or be suspected, the precautions outlined in the aircraft operator's manual and maintenance inspection procedures should be followed. Any helicopter subjected to a lightning strike must be given a close visual inspection and analysis to determine airworthiness before it is retured to flyable status. – Adapted from Oct 78 *US Army Aviation Digest*. ★

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 Koren Kolligian, Jr., Trophy

Major Paul H. Froeschner

Major Froeschner, 4007th Combat Crew Training Squadron, demonstrated extraordinary airmanship while recovering an FB-111A on 17 October 1977. At night, while descending into low level at 425 KIAS, Major Froeschner's aircraft entered the clouds at 14,000 feet where all outside references were lost. Descending at 4,000 feet per minute, the radar altimeter locked on at 5,000 feet above the ground (AGL). Seconds later, Major Froeschner saw a bright flash on the leading edge of the windscreen and sparks filled his entire field of view. Simultaneously, he heard a loud "bang," the aircraft shuttered violently and began an abrupt, rapid roll to the right. All cockpit lighting was momentarily lost, and the stall warning horn activated. Feeling he was losing control of the aircraft, Major Froeschner applied maximum afterburner on both engines and backstick pressure to arrest the aircraft's descent and initiated a climb. As his airspeed decreased through 150 knots, he began to lower the nose of the aircraft to avert a full stall condition. His auxiliary flight airspeed indicator read 530 knots and the auxiliary attitude indicated a dive. He pulled the aircraft back into a nose high attitude and continued to fight the uncommanded rolling moment. With the rolling moment, continual stall warning indication and conflicting attitude and airspeed indications he informed Air Traffic Control (ATC) that he was considering ejection. Shortly thereafter, by using the auxiliary attitude indicator and cross checking it with the turn and slip indicator, he was able to establish a wing level climbing attitude. He noticed that the radar altimeter had broken lock indicating the aircraft was above 5,000 feet AGL and began to think the aircraft was recoverable. As he climbed through 15,000 feet, he broke out of the clouds and regained a visual horizon. Visual inspection by a KC-135 revealed no major damage. A controllability check revealed that, when he turned off the roll damper, the abrupt rolling moment subsided to a point where an approach and landing could safely be accomplished. With gyro-out headings from ATC, he descended through the clouds and broke out at 3,000 feet regaining outside references. He then executed a gyro-out GCA to an uneventful landing. Postflight analysis revealed major damage caused by the lightning strike. Major Froeschner's performance in averting an aircraft accident and possible loss of life demonstrated his competence and professionalism.

Nominated for the Chief of Staff Individual Safety Award

Mr. Richard J. Scott

Mr. Scott has distinguished himself through outstanding performance as the Wing Ground/ Explosives Safety Manager at Williams AFB, AZ. His dynamic leadership and ingenuity in developing and implementing outstanding safety policies, programs and procedures are worthy of special recognition. His work in meeting Occupational Safety and Health Act (OSHA) requirements and vehicle accident prevention has been particularly noteworthy.

Mr. Gordon N. Reese

Mr. Reese demonstrated outstanding knowledge, managerial skills and initiative in establishing a highly effective accident prevention program for the Strategic Communications Area (SACCA). The SACCA consists of 27 units at 27 separate bases throughout the United States. Through his dynamic leadership 12 of his 27 units received National Safety Council Awards for accident reductions. ★

STATIC DISPLAYS and air shows

Major Roger L. Jacks • Directorate of Aerospace Safety

I recently read an article in *Aviation Week* by A.W. Bedford called "Demonstration Flights Deliver Message." It discussed preparing for and participating in air shows and got me to thinking of my experiences in attending air shows and static displays. I remembered the fun, the challenges and the pitfalls a crew can experience.

Air shows and static displays are a chance to show the public what the Air Force is all about, put an aircraft through its paces, show your pride in your aerospace machine, and let your ego bask in the attention it receives from the spectators. Air shows are not only fun, but a necessary function of the Air Force. Displays develop public trust, confidence, and pride in our military services. As crew members, we owe it to ourselves, the Air Force and the American public to effectively plan and professionally perform our roles in an Air Force display. Although it looks like an easy task, it may be more involved than you think.

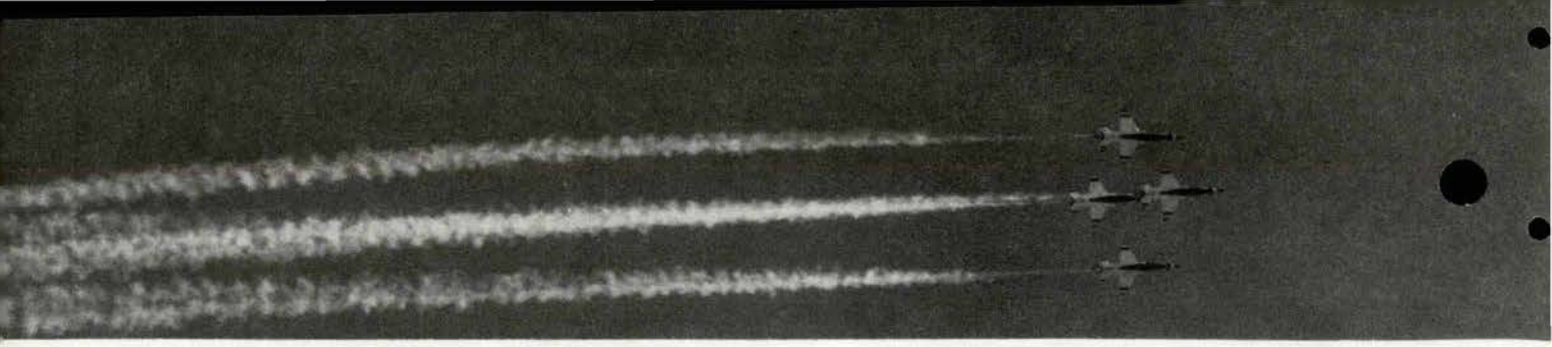
I recall my first experience attending a static display at another base. The day before the display we thoroughly planned the mission. We were confident we had everything taken care of: Crew coordination, the route, fuel requirements, airfield layouts, AGE requirements, ATC coordination, and even an extra set of gear pins.

The next day, our mission had been uneventful as we approached the base which was to host the static display. We were a few miles out of final when a call came over the radio: "Demon 22, this is the tower. We have a lot of folks down here that would like to see your aircraft perform. Could you do a few maneuvers before you land?" In the cockpit, total surprise prevailed. This was to be a static display. No one had said anything about flight demonstrations. The pilot thought for a minute and then said, "Sure, any restrictions I should be aware of?" The tower answered back, "The only restriction is your ability!!"

Well, we had total mayhem in the cockpit. The pilot was trying desperately to get the aircraft cleaned up for a high speed pass and was thinking about doing some type of impressive pull up. The rest of the crew were busy monitoring the aircraft and wondering what was going to take place. Everyone was extremely anxious to find out if the controller's statement had gotten to the pilot. There was no time for crew coordination now; the runway was in sight and the show was ready to begin. Uncertainty was in everyone's mind. What maneuvers are we going to do? Will discipline and professionalism win out over ego challenges and dares?

Well, the story has a happy ending. Our aircraft commander put on a good demonstration without jeopardizing his professional standards or putting his crew or aircraft in an unsafe situation. Still, the fact remains we had allowed ourselves to be put into a precarious situation, performing demanding flight maneuvers without prior planning and coordination.

The professionals such as Bill Bedford say that's a good way to end up 6 ft or 60 ft under ground. In *Aviation Week* he relates an incident that just about closed the curtains on his career. In the late 50's he was flying the two seat Hunter for Hawker Aircraft Ltd. He had been demonstrating the aircraft at the Farnborough Air Show doing a spectacular 13 turn smoking spin from 18,000 ft to 6,000 ft, where he would initiate his recovery. Shortly after the close of the show, he was directed to fly the plane to Switzerland and demonstrate it to the Service Technique Militaire. As he approached the field, the controlling authorities asked him to put on a demonstration. Although it was unplanned he agreed, and proceeded to put his aircraft into a steep dive and let loose with a series of low altitude aerobatics. As his performance neared its conclusion, he decided to do the smoking spin maneuver.



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He entered the spin at the normal 18,000 feet and everything was going smoothly as he spun his way down to his 6,000 ft recovery altitude.

As the target altitude approached, Bedford began to ease the aircraft out of the spin; everything was going right—until he looked outside the cockpit and saw the ground unusually close. As he puts it, "A brief feeling of professional pride was suddenly shattered . . . adrenalin flooded the cockpit, the pilot became less efficient. I had arrived at coffin corner. Pull too hard and I've had it; don't pull hard enough and I've had it, and I've probably had it anyway," What had gone wrong? In his rush to honor the controlling authorities request he had forgotten two things: To reset his altimeter and to remember the differences in field elevations at Farnborough and the Switzerland field.

This story, too, has a happy ending: Mr. Bedford made it with a few feet to spare. If it can happen to one of the best, it can certainly happen to one of us. Bedford says it best: "To avoid the pitfalls and prolong active life, an important, fairly obvious requirement is to stick with concentrated determination to the guidelines and to one's own strict personal professional creed. . . .

Here is a collection of other ideas to keep in mind when planning for a static display or air show.

- Plan basic demonstration patterns well ahead. (Have a plan to handle arrival and departure requests in case you're asked to perform some maneuvers unexpectedly.)
- Study the display area, know and understand all the rules of the air show.

Ensure that the fuel allowance is sufficient to cope with the unexpected.

- Recognize the importance of a disciplined demonstration. Avoid at all costs getting sucked into trying impromptu maneuvers to outdo someone or to fulfill worthless challenges.
- Prepare mentally and physically for all manner of distractions at critical periods in the demonstration, i.e., ambiguous radio messages, systems going off line, etc.






(things a good USAF crew does anyway, but even more critical during demanding flight regimes).

- Realize the killers in demanding flight maneuvers are lack of concentration, overconfidence and lack of current practice.
- Health and fitness are always important. Good physical condition with a healthy mind that's not burdened down with stress, personal problems or fatigue is the key.
- Once the crew planning is done, sit down with your commander and tell him your plan. Talk over all aspects of the static display or air show and try to anticipate the unexpected, the problem areas. Once you've finalized your game plan, try and stick to it.

Have fun, but approach demonstration flying with your utmost professionalism. The experts sum it up best. Pat Henry, Chief Experimental Test Pilot for the McDonnell Aircraft Company and one of the F-15 demonstration pilots states, "In my opinion there are three basic tenets of demonstration flying—discipline, knowledge, and maturity. Discipline is the primary motivation during the demonstration. It is the force that compels you to enter each maneuver from well-known and practiced initial conditions. Intimate knowledge of aircraft capabilities and maturity complement the discipline factor and ensure a reasonable compromise between overconservatism and edge of the envelope showmanship."

Neil Anderson, Chief Test Pilot of General Dynamics and F-16 demonstration pilot says, "We approach demonstration flying with the identical and deliberate preparation that precedes the most difficult test phase. This includes highest management approval, designated pilots, contingency/weather conditions, safety aspects and, most important, the training prerequisites in the demonstration aircraft. ★

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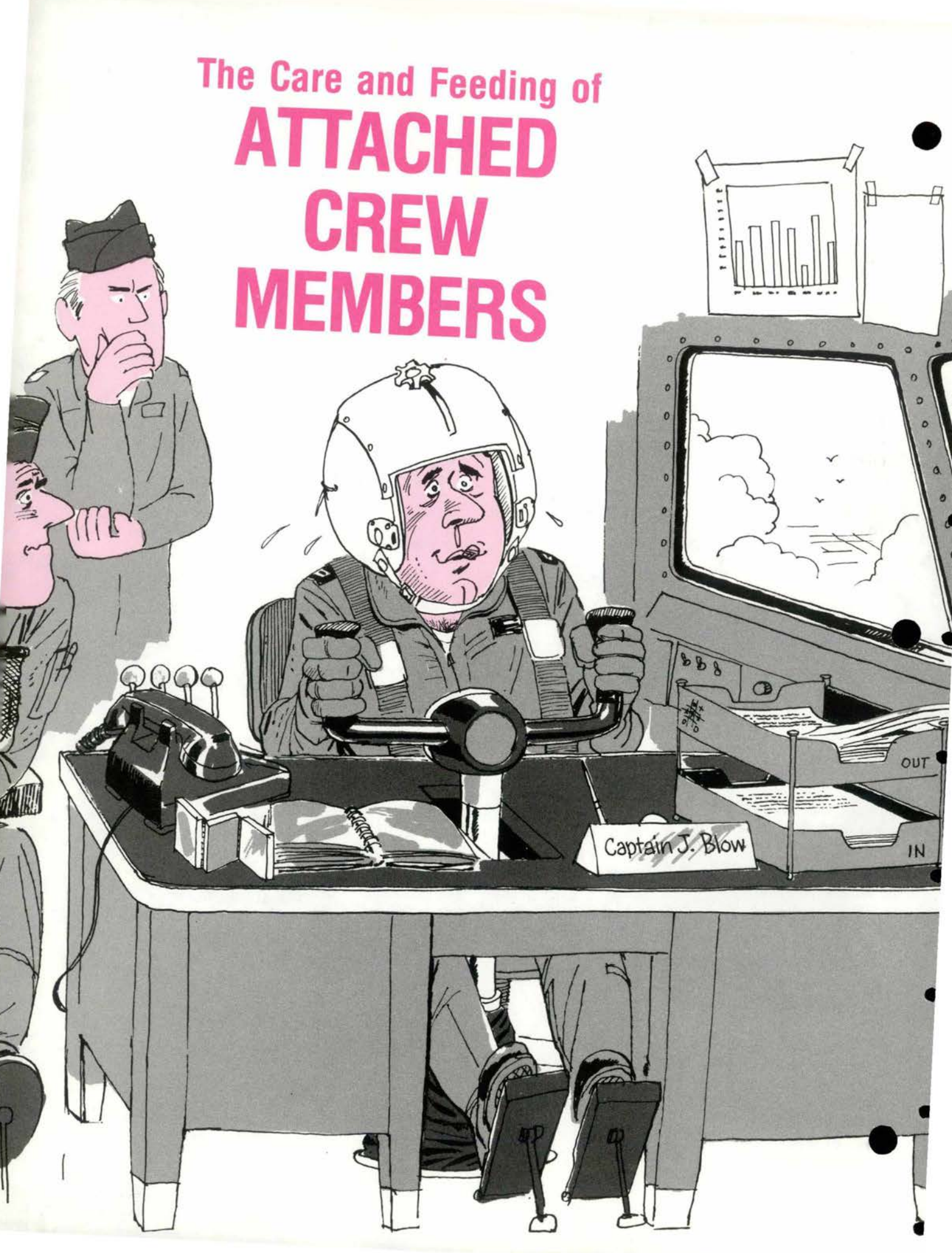
The Care and Feeding of ATTACHED CREW MEMBERS



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Aheretofore endangered species, this often misunderstood group has now settled colonies in almost every flying organization around. They come in all sizes, shapes, ages and colors, and are called a variety of names from the more formal "attached crew member" to the lovable "staff weenie" (or worse). These individuals can be recognized by a current weapons system identifier of "desk, 1 each, gov't issue, usually grey, etc." Take pity on these poor creatures, all of you full time fliers, for some day you may also join the ranks of the sometime aviators.

More seriously, with the post-SEA drawdown and cuts in flying time and slots, there seemed to be an increase in the numbers of flying folks occupying non-flying jobs. These fall into a variety of Rippy (RPI) codes but are flying mostly because: (1) their job requires a continuing closeness with flying operations (i.e., safety, scheduling, etc), or (2) the individuals haven't met certain "gates" requirements. I've been flying for about 12 years and have had several "experts" explain the entire system to me and finally gave up trying to understand it. The fact is that most flying organizations have anywhere from "several" to "numerous" (over 50) crew members who may fly only two or three times per month. In most cases they are still carrying the same responsibility and must maintain the same proficiency as the folks who fly five or ten times as often. Thus the reason for this article!

I speak from experience. I am one of those "well-rounded USAF pilots" who suffer from terminal supplement-itis." No complaints, because I have been fortunate enough to check out in six different airplanes and hold a variety of interesting jobs. The bad part of the deal is a weakness that I will admit – I am not as proficient a pilot as I would like to be. I don't care what anyone says – the more you fly, the better you will be at it! Sure, there are related problems like complacency, overfamiliarity, distraction, etc., but basically you have to do it to stay good at it! With that in mind, I'd like to pass on some ideas from someone who has been "attached" in three different MAJCOMs and three different airplanes for the past 6 years.

THE PLAYERS

"The Attachee" – usually in the grade of captain or major, but can be as senior as 0-6. The attachee has anywhere from a variety and depth of experience to no experience at all. They vary from lots of availability and desire to fly often to the phantom of the line.

"The Attachor" – varies from a squadron whose manning is low due to a large number of attachees, to the squadron who has a very specialized mission or complex weapons system and only one or two "visiting" fliers.

PROS AND . . .

For the unit – The organization can benefit from the attached flier. Aside from the gain in manpower which hopefully (not always) benefits the squadron, attached fliers often bring with them a background which can enhance the experience level of a unit. This outisde and "ancient" perspective may be of great value to the flying unit which has today's common dosage of "teenage low-time throttle benders." Seriously, some of us old folks have been places and seen ways of doing things that might help your operation.

For the flier – The obvious benefit for the attached individual is the opportunity to maintain some semblance of currency. Not only is this important for the hands-on part of aviating, but also for the myriad of rules, regs and paperwork we live with. For a flier to be completely away from the book aspect of operating airplanes for 4 to 5 years really requires a comeback.

CONS AND . . .

For the unit – Many flying units are first to grasp at the disadvantages of having "to put up with staff pukes flying *our* airplanes." Without going on the soapbox about all in the same color uniform, etc., I will grant that, yes, there are some disadvantages. First, you may find glitches in your scheduling process. Availability – the word which conjures up different points of emphasis in the minds of attachees, bosses and schedulers! Yes, Virginia, you will probably have to put up with some cancels, lates and snafus because the attachees aren't under your thumb like your full-time folks. Second, it is a plain fact that some of your attachees may not be as proficient on the pole as you line jocks! Therefore, the managers and supervisors in the organization may have to match crews, schedules, crew positions and missions.

For the flier – The bad part for the crew member is the double job. They are expected to maintain knowledge and currency while still doing their primary job. Often the flier will get little-or-no support from his supervisors. Reactions vary from jealousy to outright harassment. Not always the case, granted, but I have seen it to be like pulling teeth to get time to fly. Shouldn't be that way!

ADVICE!

For the unit – Take an objective look at your program with regards to two areas: Training and Scheduling! Continuity of training for attached folk requires some extra thought and effort. Don't get the wrong idea 'cause the last thing they need is pencil whipping or abbreviated training. All I say is that they may require a little consideration when it comes to times, places and depth. Example – I've gone to systems refreshers that turned into "glossovers" for the full-time fliers when I would have liked to get down to it and really relearn and refresh the system in depth. That's an easy trap for full-timers to fall into because they deal with the info day-in and-day-out. Take an empathetic look at your training programs from the viewpoint of a person who can fly only 2-3 times a month.

Scheduling needs special attention too! Again, a little empathy is in order. Be willing to massage your schedule a little. If an extra mission arises, take the extra effort to call some attached folk. They probably need the practice! Be aware of the attachee's possible supervisor problem and work with them to maximize both your efforts.

Honest shot! Remember, above all, that you are responsible for your operation! If you feel you are expending the effort and you do have an attachee that isn't hacking the program either proficiency or availability-wise, do both of you a favor and tell him! Ignoring the problem won't make it go away unless it turns into a mishap statistic!

For the flier – The best advice is to KEEP UP! Granted, that's an oversimplification but a lot of attachees get lulled into a false sense of security. Realize that you need to force yourself to stay in the books more and work harder in the cockpit. Shoot the ILS and a VFR day instead of the visual or 360. Take good advantage of every training opportunity you get. Take extra simulators, trainers or whatever – you need 'em! Above all, be honest with yourself about your own knowledge and proficiency. You may have to adjust your own personal minimums upward if you go 29 days between flights. Don't let deadly pride back you into a corner.

For the supervisor – You are in a unique position. You have one-or-more folks working for you who are moonlighting as aviators. I say that because I have been an attachee since the last war and have been fortunate enough to have bosses that either supported or at least didn't hassle, part-time fliers. I have seen the boss who wore the other hat however. I've heard the statement "Flying isn't your job anymore, if you want to fly do it at night or on weekends." You gotta be . . . kidding me! Believe it or not, there are those around. Again, without getting on the "fly and fight" soapbox, let me advise – as a supervisor, yes, you have a duty to your mission! A portion of that mission is care of your people and an attached flyer needs a little extra care. Part of his (or her) trade is aviating, regardless of the current job title. Time needs to be made available for the pursuance of proficiency in that trade. Work with 'em, not against 'em!

Of course, the thrust of this article is favored toward the flying of aircraft by attached crew members. I am one, so it's very difficult for me to write a piece saying "help stamp out part-time fliers." I don't believe that would be a good plan anyway. I feel there is a valid place for attached crew members in any operation. The main point is that they can't be considered the same as full-time fliers and they shouldn't consider themselves the same as full-time fliers. Either situation might, at best, be embarrassing and, at worst, dangerous. Recognize attachees for what they are – part-time aviators with advantages as well as possible limitations. Safe and sane aviating is the goal, regardless of the category of operators. ★

MESSAGE TRAFFIC

Winter and Spring bring all of the traditional hazards associated with marginal weather. A recent HQ AFISC message cited the tragic results of attempted VFR flight in deteriorating weather conditions. We had a close brush with this in 1977 when an OV-10 was forced into a 180 degree turn in rapidly deteriorating weather conditions and hit a power line. Luckily the only damage was to some aircraft sheetmetal and the pilot's peace of mind. Others, however, have not been so fortunate:

1968, KOREA: Flight of four F-4 D's was weather recalled to home base. Lead sighted a sucker hole, attempted to lead the flight under the clouds, lost control, and crashed.

1969, CONUS: Following a low level an RF-4C crashed at the range entry point. Weather was 500 ft scattered, 1,500 ft broken, visibility 3-to-5 miles in rain and snow.

1970, CONUS: An RF-4C aircraft crashed on a VFR low level route in known deteriorating weather.

1972, Spain: Two F-4D's were returning to home base from the range at low level. They impacted 200 ft apart, 2,300 ft up the side of a 2,400 foot mesa.

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letters to REX

DEAR REX,

I just finished reading an article in our local base paper which praised our local transient alert personnel for winning the coveted Rex Riley Transient Services Award. The article was a good one complete with pictures, and passed on some well-deserved praise for a hard-working group. My only complaint is that the article left most people with the impression that TA was the only agency involved.

I write because I think you need to remind your readers again that safe, efficient service for transient aircrews is a *team effort* involving numerous agencies on base. The combined professional attitudes and performance of TA, billeting, base ops, transportation, food services and AFCS personnel at our base were responsible for our selection to receive a Rex Riley certificate. We're all proud of it and hope we keep it for a long time.

Concerned

Dear Concerned,

Couldn't have said it better! I might mention that several bases have had their graphics folks make up a sort of a certificate with the Rex patch on it to be displayed in billeting, TA, etc. Since we can only send one actual certificate and recommend that it be hung in base ops for crews to see, this type of an arrangement allows all agencies to share the honor. The only problem that crops up is removal. We have removed a few bases from the list (and plan to remove a few more) and want to retain the flexibility to take folks off when their service warrants. This may cause some shuffling among agencies concerned, but it will remain one of those necessary hassles if the situation arises. Thanks again!

DEAR REX,

I was happy to hear the announcement that your program of base evaluation of transient services was alive and well as reported in "TIG Brief." Over the years many bases provided outstanding support to crew members because they wanted to earn the Rex Riley Transient Services Award.

The crew members in Air Training Command have a unique problem you may be able to help us with. Our mission is to train pilots, and our student cross countries are invaluable in that regard. Unfortunately, many bases restrict our ability to perform that mission. The enroute supplement is filled with PPR's, OBO's, limited TA hours, one approach to a full stop and numerous other restrictions that severely limit the student pilot's exposure to strange fields and approaches. Since we must maximize our training on every mission these restrictions are limiting our ability to train pilots.

Hopefully, your evaluation of a base will include a review of the base's enroute supplement restrictions. Your assistance in reducing those restrictions to enhance our training will be a big help to the jocks in Air Training Command.

ATC IP

Dear ATC IP,

You're right! Also try some pre-coordination for regular training with times, places, standard arrivals, etc. Lots of places would be willing to help you out if you'd give 'em some advance info to work with so they can coordinate with TA, POL, transport and other interested agencies. Cooperation is the name of the game.

DEAR REX,

A couple of weeks ago some aviators filed a 175 for a formation flight. One aircraft was an F-4 and the other was a T-38. The F-4 was lead and the pilot called tower requesting clearance for "FLOP 01" a flight of two. Tower replied that clearance was not available. Several minutes went by when "FLOP 01" again requested clearance. Tower still had a negative reply but queried base ops. Base ops stated that they had no clearance request or flight plan for "FLOP 01." Many communications later "FLOP 01" and wingman launched. What happened was: When "FLOP 01" filed his flight plan he put both his call sign "FLOP 01" and wing's call sign "ZOOMY 04," in the call sign block. In the type aircraft block he listed both aircraft by type. In both instances the T-38 was listed first. Since the ARTCC computer will only accept one type aircraft and one call sign, the base ops guys indicated "ZOOMY 04"—2/T-38s. The tower had a clearance for "ZOOMY 04" flight but not for "FLOP 01" flight. Get the picture? Anyway Rex, the formation commander should have put lead call sign and type, i.e., FLOP 01, 2/F-4s, in the top blocks of the 175 and in remarks indicated: #2 aircraft is T-38 (ZOOMY 04). Please pass this note to all your readers.

Base Ops Type

Dear Ops Type,

An isolated example, but a good point. A lot of folks are somewhat complacent about the info they place on the top three lines of the 175. Aviators–it's a good time to dig into FLIP for a review of what the form really calls for. Might save you some time and JP. ★

Rex Riley on the road again! A reminder that "Yes, Virginia, our friend Colonel Rex Riley *did* retire from active service several years ago." However, we have had such excellent feedback on the award program that there would be much lost in the translation if we tried to re-name the program and re-educate the folks in the field. For that reason, we still refer to "Rex Riley" making evaluations and we will publish some "Dear Rex" letters. We feel this goes along with the intent of the program. Speaking of "intent," we'd like to pass on some philosophy.

We are approaching the evaluations with the feeling that:

1. A base already on the list is the most vulnerable! We will look extra hard to see if they measure up and deserve to retain the award.

2. A base not on the list will really have to dazzle us in order to be recommended for the Rex Riley award.

The above may sound somewhat hard-nosed and sanctimonious, but time and time again we see installations doing more with less. Money shortages, facilities reductions and personnel cutbacks don't qualify anyone for a "lone ranger" rating. The point is that lots of folks are providing super service despite those problems. The common answer to all the good guys is attitude! We are going to try not to reward mediocrity. Nuff said!

Information An area worthy of mention seems to be the relationship between TA folks and the aircraft 781. I don't pretend to know all of the intricacies of the business, but I can sure tell when someone has spent some time in my forms updating and checking. On the last evaluation trip we stopped several places that didn't bother to enter a thruflight let alone put in an entry for the fuel. It's that extra knowledge and time expended that may catch an overdue SOAP sample, inspection or T.O. check. Could be an area worth checking your own house for! The 781 is a super safety tool for both crews and maintenance folks, but only if it's used properly.

An idea that dazzled me on my last trip was an innovative and well-coordinated "RON" packet. The three-sheet packet contained a base map reprint, a list of neat times and phone numbers and a "departure pre-brief" sheet! The last item seemed like a real help to both crews and base folks alike. The dispatcher handed me a packet and asked that I take a few minutes to fill it out before I left. It was a simple sheet calling for some info which would smoothen my departure the next day. Such items as # persons, requested transport time, flight lunches—yes or no, departure time, special equipment requests, destination and alternates and flt level were on the sheet. From this questionnaire the base ops folks coordinated my entire departure including wheels, TA preliminary weather info, and PAX services. Sure there can be changes and glitches, but it's an example of some ingenuity, empathy and super attitudes by the base to save the crew member hassle and lots of phone calls.

Retained awards

HOMESTEAD AFB, FL

Way down South, the airdrome is not exactly on a crossroad, but it is still a good place to go. Good ops, transport and billets for transients. Lots of big and little traffic in the area—keep eyeballs moving.

PETERSON AFB, CO

Pete continues to be a good X-U.S. stopping place. Transient folks, base ops and transport system are among the best. Quarters were super and all facilities close and handy. CAUTION—Some inbound mental review of high attitude performance factors, rapidly rising terrain and landing at a joint-use military/

civilian airdrome may prevent embarrassment or injury. Weather changes faster than a speeding bullet don't get caught.

POPE AFB, NC

Another place with lots of traffic, a super-close restricted area and often changing weather. Folks at Pope seem genuinely interested in providing good service.

DOVER AFB, DE

Caution—wake turbulence from the heavies! Even though a "Big-MAC" base, Dover takes good care of the little drivers too. The service is a direct result of conscientious attitude from supervisors on down. Don't let up!

Ho Hum!

When you visit 50+ USAF and ANG bases within six months, you can't help forming mental comparisons. This trip we visited two bases which were making the grade but just barely. Compared to many of the really top notch places we've visited, these two rated a "ho hum" for transient services. The kind of place that doesn't give you any real bad deals but obviously doesn't expend a lot of extra effort either. For that reason, we aren't sending them a Rex certificate. Hopefully, we can get the list to eventually reflect the bases and individuals who are out there sincerely trying to create and maintain extra good service.

On The Other Hand . . .

We also spent some time (too much in one case) at some places which could use some cleaning up of their act. To protect the guilty (and, reduce the number of irate phone calls) we'll call them X, Y and Z.

- Base X—Base ops flight plan room a disaster! Shabby, falling apart and charts missing to name a few problems. Billeting usually good but some rooms in a bad state of disrepair. TA lackadaisical. Other than that. . . .
- Basy Y—Transportation took 45 minutes and then a no-show. Could have died of old age waiting. Flt plan room not very conveniently arranged and had only one set of charts available.
- Base Z—Arrival was a disaster! Approach, tower and ground control obviously hadn't had a conversation in quite a while. It was downhill from there. Took 90 minutes to get gas and go. Granted they had a few extra birds but still no cigar!

Again, the common thread seems to be apathy. The acceptance of an attitude of "just doing enough to get by" is obvious as you travel from base-to-base. If you get a bad deal, write REX! (AFISC/SEDAK, Attn: Rex Riley, Norton AFB, CA 92409.) ★

THE

REX RILEY
Transient Services Award

LORING AFB	Limestone, ME
McCLELLAN AFB	Sacramento, CA
MAXWELL AFB	Montgomery, AL
SCOTT AFB	Belleville, IL
McCHORD AFB	Tacoma, WA
MYRTLE BEACH AFB	Myrtle Beach, SC
MATHER AFB	Sacramento, CA
LAJES FIELD	Azores
SHEPPARD AFB	Wichita Falls, TX
MARCH AFB	Riverside, CA
GRISSOM AFB	Peru, IN
CANNON AFB	Clovis, NM
LUKE AFB	Phoenix, AZ
RANDOLPH AFB	San Antonio, TX
ROBINS AFB	Warner Robins, GA
HILL AFB	Ogden, UT
YOKOTA AB	Japan
SEYMOUR JOHNSON AFB	Goldsboro, NC
ENGLAND AFB	Alexandria, LA
KADENA AB	Okinawa
ELMENDORF AFB	Anchorage, AK
PETERSON AFB	Colorado Springs, CO
RAMSTEIN AB	Germany
SHAW AFB	Sumter, SC
LITTLE ROCK AFB	Jacksonville, AR
TORREJON AB	Spain
TYNDALL AFB	Panama City, FL
OFFUTT AFB	Omaha, NE
NORTON AFB	San Bernardino, CA
BARKSDALE AFB	Shreveport, LA
KIRTLAND AFB	Albuquerque, NM
BUCKLEY ANG BASE	Aurora, CO
RAF MILDENHALL	UK
WRIGHT-PATTERSON AFB	Fairborn, OH
CARSWELL AFB	Ft. Worth, TX
HOMESTEAD AFB	Homestead, FL
POPE AFB	Fayeteville, NC
TINKER AFB	Oklahoma City, OK
DOVER AFB	Dover, DE
GRIFFISS AFB	Rome, NY
KI SAWYER AFB	Gwinn, MI
REESE AFB	Lubbock, TX
VANCE AFB	Enid, OK
LAUGHLIN AFB	Del Rio, TX
FAIRCHILD AFB	Spokane, WA
MINOT AFB	Minot, ND
VANDENBERG AFB	Lompoc, CA
ANDREWS AFB	Camp Springs, MD
PLATTSBURGH AFB	Plattsburgh, NY
MACDILL AFB	Tampa, FL
COLUMBUS AFB	Columbus, MS
PATRICK AFB	Cocoa Beach, FL

THE MIDDLE EAST

Ronald P. Barrett
President: Saudi Aviation Maintenance Manufacturers Association

The captain tuned in LUXOR on 112.3 and the copilot confirmed that LXR was being received Loud & Clear.

The NAV called out "over station" and tuned to 124 mag outbound on R39. "Cairo control this is Cobra I 129.4."

"Cairo control this is Cobra I on 129.4. Do you read?

"MEA reporting LUXOR at 17:15Z, altitude 28 thousand, estimating R39A at 17:40Z. Cairo do you read?"

The sun was dipping now below the hot desert ridges to the west. Out the right side could be seen the black snake image of the Nile extending into the distance. The cockpit crew was changing their radio communications and still trying to reach Cairo. The ETA to R39A was coming up in 2 minutes and not one word from ATC, anywhere! Out over the Red Sea now and R39B to report next.

"Go, Jeddah," the AC commanded in all confidence.

"Jeddah, Jeddah, this is Cobra I reporting at 28 thousand. Do you read?"

Static and electronic chirps was all the crew could hear when the red fire pull "T" handle suddenly turned brilliantly on, and the number 2 nacelle overheat came on!

"It's number 2, condition lever FEATHER," the AC commanded. He turned and could see smoke pouring from the number 2 nacelle. "Loadmaster to AC, there are visible flames this side of number 2 engine."

"FIRE HANDLE pulled"; the fire bottles were discharged, bleed air isolated and yet the overheat condition persisted.

The Cairo stop and images of the open number 2 cowling flashed through the flight engineer's mind. There was some fuel leakage at the fire wall zone, but it did not appear as anything significant; besides they had checked that engine over thoroughly. No matter, it was fully aflame now!

The emergency commands continued: "Generator Switch" – "OFF." "Fuel Boost Pump Switch" – "OFF."

The NAV had dropped into the 130's crew door area which was now aglow with the light given off by the torching turbo prop.

"It's burning worse than ever!" the NAV shouted into the cockpit. "Emergency descent. Nearest land 090° – 090°."

"Call JED, we're declaring an emergency." "AC, Loadmaster. We're filling up with smoke in here – going on smoke mask."

"How bad?" No answer. The Loadmaster was fighting to chute up the fourteen Army types in back. The aircraft began to shudder and the crew bags that had been stacked up on the top bunk tumbled onto the navigator's table. Smoke now was billowing into the cockpit.

"Jeddah, Jeddah, this is Cobra I on 121.5. Do you read? Do you read? Descending through 20,000."

BAM! The old 130 lurched to the left as the crew fought to maintain control and not to be overcome by the dense, acrid smoke. The yoke snapped over and the Herc started into a roll.

The AC fought the controls, finally rolled upright and prepared for a water landing. . . . Doors open, sea rushing up to the aircraft. Rafts out!

The passengers were the first to go, the non-crew members in random order were shoved between the operating flight crew and, but for two injured during the emergency egress, all hit the water alive and as well as could be expected. The aircraft tumbled into the sea not far from the men bobbing in the water. The flaming wreckage lit up the scene like the morning sun. The calmness of the Red Sea allowed for a rather easy but lengthy water gathering. It had now taken 3 hours to get most of the survivors into the lone 20 man raft.

Of the twenty on board, two could not be found at sea and two of the 18 men in the 20 man raft were injured badly, with all survivors in near shock. The crusty ol' colonel appeared to have a broken back and the AC had dislocated his shoulder, and was cut deeply on the cheek. The water was warm, with a 5-to-10 knot wind blowing from the Northwest. The nav, as if by habit, looked at the dark, starry sky and tried to estimate the direction of drift of the raft. Impossible, he thought, no fixed references. The copilot was now into the emergency kit. "Where and the the hell are the search people?" the loadmaster asked. "Don't know," murmured the AC. Psssssssssss.

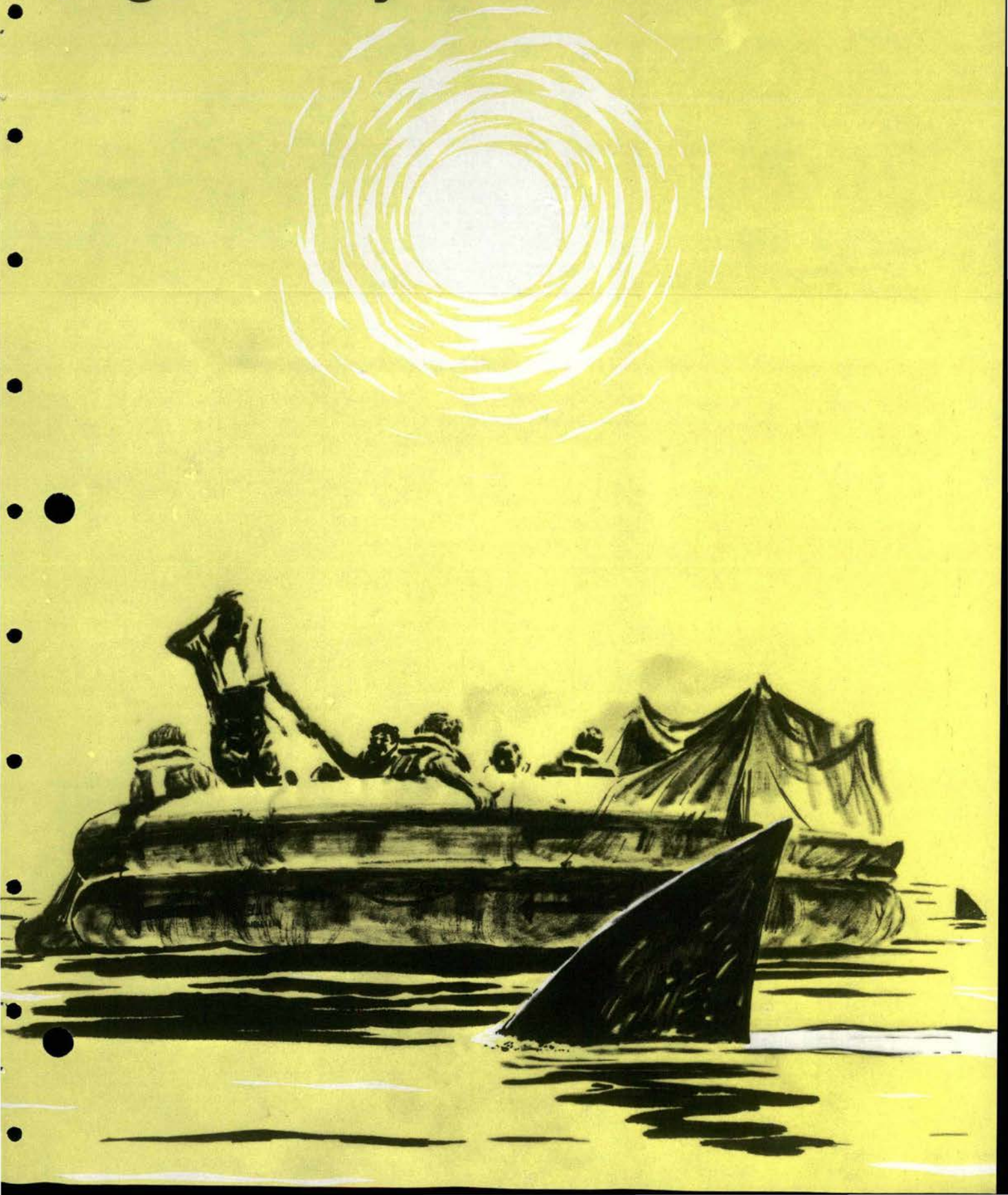
"OH, NO!" shouted one of the Army types, "NO! NO! NO!"

The lower chamber of the raft started to soften. The already jammed up bodies began to slide into the center of the raft.

"Get the pump." At that, manual inflation of the raft was attempted.

It was a truly sad and wearing group that found out that rafts are very sensitive flotation devices.

Flight Safety and Survival



Capsize! If this were to happen at sea rather than in shallow water the results could be disastrous.

In a simulation exercise the participants properly carry the raft to shore over the razorlike coral that could shred the fabric.

Pump as one might, a pin hole leak can lose more than a healthy man can pump! Raft pumps are poor pumps. More than that, who in the darkness was going to attempt tearing a hole in the raft chamber so that one of those archaic, ungainly raft repair patches could be used. An even more frightening event was when the raft sea anchor became fouled during the night on a coral outcropping and the nylon line "rubbed" the chamber raw making an entire 3-square-inch area pervious. And to make all matters worse the entangled sea anchor was cut free, and the surf passing over the coral shelf immediately capsized the raft.

The aircraft commander and colonel were drowned in the capsize because the raft canopy was up and they had become trapped inside. Most of the remaining 16 survivors now had cut feet, as they had taken their shoes off in the raft and were not anticipating hitting their feet on coral outcroppings. The canopy was of questionable use anyway, as no one could hear when seated under it due to the wind whipping it up and down. They could never have heard a search aircraft at any distance. Most of the items in the survival kit were spilled into the sea. Only what was tied to the raft remained. The sharks circled in deadly silence.

The young flight mechanic had often thought in his quiet moments while riding endless hours in the back: "What would he do in a situation like this?" He had remembered much from his survival training and added even more. He had swallowed his pride at 21 and had taken a full Red Cross Life Saving Course. He had been a poor swimmer up to then. He kept his LPU on in the raft, had tied his shoes to the side straps and kept a keen eye on the heaving line on the raft. It was he who had held onto the line, thus keeping the raft from flying completely away, and he had even saved his battery powered light. Now with light on, bobbing in the water, and towing himself to the raft he shouted to gather up the remaining survivors.

The raft had no light on it, so it was all but impossible to locate in the darkness. A pair of pants was tied onto the heaving line as a sea anchor. The canopy was "held about" as a round blanket, not to be put up again. By listening to the changing sea sounds and knowing that the swells were changing frequently the young E-3 knew they were traveling into a surf condition once again. If all conditions were right, the night sea/land breeze might carry the raft to shore and indeed this was happening.

Twilight now. Ten hours in the water, two lost, the sixteen survivors, now exhausted, prepared for reef crossing. They could see the shore line. "I can see bottom," one of them shouted.

"Watch – don't get the anchor caught."

"Pull it up."

"You do and we'll capsize again."

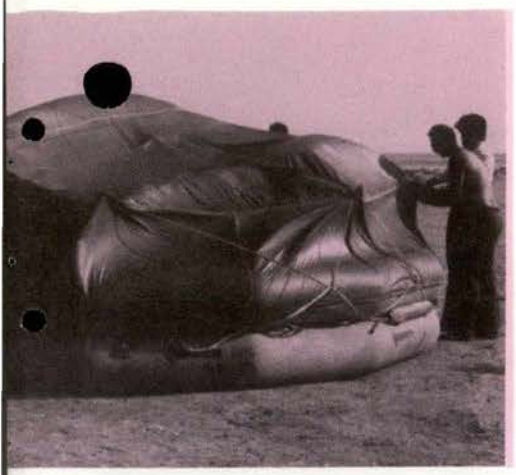
"NO!", shouted one of the passengers.

"Play the anchor in and out . . . NAV you watch out the front and we'll watch back here. The rest of you, half on the right side and half on left side – get ready and paddle to keep us on an even keel. Don't let us turn!"

Their game plan was a good one. Five frightful minutes later they had successfully crossed the churning reef. Terrified and weary, they were in shallow water now, when – tear! Pssst! Gone was the last of the raft!

They had not realized that once into hip deep water they should have gotten out of the raft and carried it to shore. A small coral outcropping had sliced it like a razor!

The sun was up now, the raft



On shore the raft can still provide valuable shelter against the brutal 120° heat and sun.

repaired, re-inflated and canopy back up. Calm and peaceful for the moment.

The land/sea breeze reversed itself and with a great "whomp," the raft was up on vertical edge now, rolling away like a great yellow doughnut!" The exhausted survivors learned that rafts, even on land, had to be anchored! The canopy poles had now damaged the raft and the punctures were very difficult to repair. Bandaids were employed to patch the small remaining holes.

The sun climbed into the sky and the comfortable sea breeze turned into an oven-like jet current of 120° F over the stone white sands of the desert beach, where the surface temperature reached 135° F.

Dehydrated, and having survived the sea the men now had to face water deprivation. The flight engineer thought back to the Cairo stop and how no one wanted to take time to acquire extra bottled water. There was no safe ground water in the area they were in. On top of all this, the World Health Organization warns that this area is endemic to Bilharzia Disease, cholera and malaria. Losses of body fluids, as through diarrhea, under these conditions could be fatal.

The midday duty of all was now to conserve their precious body fluids and to stay in their "raft desert tent." The raft was fairly comfortable, providing shade, wind blast and dehydration protection, and kept the survivors off of the salty sands. A man under scorching desert conditions, doing moderate work can sweat a gallon of fluid away in one hour. If this were to happen he would surely go into heat exhaustion, delirium and die. If he were to survive, brain damage would be a likely side effect.

The raft was inflated, the canopy rolled up, with side walls open to allow the breeze through. All now settled down, drowsy in the 120° F heat, immobile, conserving body fluids.

"Sadique! SADIQUE!", called the dark brown man in a white flowing gown. (Friend, Friend) "INTA Quwais?", the stranger said. (Are you good?)

Some of the group, having studied Arabic, snapped up and entered into a lively conversation with the local Bedouin. They knew the rule of the local tribes was to help strangers and quickly informed the Bedouin that they were indeed "Sadique" and needed "MOYA" (water). At that the phantom stranger called out in a loud voice "Ta'all, Ta'all" (Come here) and ever so quickly two others came into sight.

It was late afternoon, and the Bedouins had driven back to the downed fliers with their little old Datsun carrying two plastic jugs of water. It is the Bedouins' way not only to help, but also to be polite and sociable.

It was now decision time again. Could the western crew drink the local water and, if not, would the health penalties be worse than the risk.

"Shie Sadique, Shukron," said a MAG NCO. (Tea my friend, please.) He realized that the water would be made safe by boiling in the process of making tea, and further the bedouins love tea.

Just then a small twin engine plane quickly passed overhead. In their jubilation the survivors had forgotten to post their watch and now scrambled for what signaling devices they had left. A smoke flare was set off – to last only 20 seconds (that is all they are good for!) That was it! They could see the small aircraft, now executing a 180°, turn out to sea and head back. The young E-3 yelled – "Wave your shirts! Throw dust and sand into the air!" At that, the shoreline became a very busy place, and the small search aircraft pilot could detect the motion and see a shadow on the sand formed by the thrown dust.

With flap and gear down the small Piper Apache twin circled, as if to indicate to land, only to pull up its gear on the second pass and go into a low race track pattern. "He wants to land," the 130 copilot yelled. "Mark a runway – let's go."

In a flurry they took everything they could: Inflated LPU, raft canopy, rocks, and the little Datsun truck and in 10 minutes had layed out a rather short but nice area of the beach for a runway.

Another day at this level of activity and no water, and they would be killed by the blazing sun. Life with no water is dangerously short.

The loitering aircraft took a visual on their efforts, and now with a local military C-130 overhead, slowly and quietly it approached to land. Then the survivors realized that the small aircraft could only land at twilight when the land/sea breeze was at null point and that wind indication was critical. They pushed the raft onto their tea fire and the black smoke rose almost straight up. The canopy was torn apart and made into an approach end marker. Conditions looked good.

The small aircraft was down now and the government pilot explained

to them the difficult ATC problems in the area, and how their confirmed entry into the area was delayed due to international borders, new equipment installations, multi-national training, security, and language difficulties. Everyone aboard the 130 should have realized these things prior to ever flying into the Middle East, but they had never given these conditions more than token thought.

In a matter of minutes all were taken into a near-by community to be treated to the greatest of hospitality and to later return home safely. Some survived – some had not.

Would you have survived?

Fictional but real. We as USAF crews operate into the Middle East daily, and from my own experience, I know we go there with an inordinate amount of disdain for any hazards.

Air Force survival training that I recollect applied to each "type of area." Desert training to deserts, sea to marine, winter to arctic but never sea and desert (and inland in winter arctic) together! (I might add that the central Arabian desert region temperatures in winter go below freezing with 15 to 30 knots winds, rather constantly.)

The Middle East flight scene is dangerous at best. First, the over-all complexity of flight operations overrides all matters. Operations are multi-national, multi-lingual, multi-operational and, in great part, lacking organized and international controls as pointed out in the Tehran Operations Conference. A good example is that one local southern mid-east small government tried to shoot down a commercial 747 "passing" in this area just last spring. Their ack ack was close enough to rock the plane! Secondly, the Northern Middle East area is terrorist prone, and thirdly, political borders are unstable.

What this gives to the crew is one very difficult safety and survival zone. For all intent and purposes there is no search air rescue capability anywhere in the Middle East. What is in place, is highly questionable.

As the former chief of flight safety training for one of the largest flight groups in the area, having lived there on the economy, and with 10 years of training pilots in flight safety, I must say flight crews going into the Middle East should do the following:

1. Expect little-or-no support. Think ahead. Do not take a problem into this area. Aircraft and crew support is nil.

2. Brief your crews thoroughly. ATC procedures in the Middle East are poor at best. (Our next midair could be there.)

3. Know the region you are going into.

a. Get a thorough briefing on terrain. Many maps are unreliable in this area. Talk to someone who has flown the area.

b. Know the local people, customs, traits, types and political affiliations. (This is a must and is in AFM 64-3.)

c. Know (even a little bit) the language. Safety is communications.

In SEA it was ground fire that could get you. Well, in the Middle East area it's the fiery ground that will get you! It's hot, it's dry and it's, for the most part, desolate. Water and "100 don'ts" will keep you safe in the M.E. "Number one don't" –; don't fly into the Middle East in ignorance!

POST SCRIPT

The photos in this article are from live sea-desert survival exercises conducted by the author for the Royal Government of Saudi Arabia.

ABOUT THE AUTHOR

Sergeant Ronald P. Barrett is the Ground Safety NCO for the 442 TAW, Richards-Gebaur AFB, MO. He is president of the Saudi Aviation Maintenance Manufacturers Association, was an Air Force navigator, and has trained crews for several airlines in survival training. ★

MESSAGE TRAFFIC

continued from page 16

1975, Germany: An RF-4C flying a local exercise low level at 500 feet and 400 knots attempted a 180 degree turn to abort the low level. He hit a cloud covered hill in the turn.

1976, CONUS: An RF-4C crew cancelled their IFR clearance to proceed on their briefed low level. The aircraft impacted on the crest of a cloud enshrouded hill.

1977, CONUS: After continuing into mountainous terrain in marginal weather a flight of two F-4E's attempted to perform a 180 degree turn low level abort. During the turn number two impacted a ridge.

Each accident shows a self-induced pressure to accomplish the mission: Get a bomb off, photograph the target, complete an ORI local exercise mission, get home fast, or fill another square. The tragic point is, they all occurred on peacetime training missions. ★

The name of the author was inadvertently omitted from the article "Things that Go Thump In Flight," appearing on page 28 of the December 1978 issue of *Aerospace Safety* magazine:

Captain Leland O. Singer
4950th Test Wing
Wright-Patterson AFB, OH

THE PROFESSIONAL APPROACH

Air Force Communications Service
Scott AFB IL

Prior to closure of the Instrument Flight Center, a concern arose over the number of accidents that have occurred during the aircrew's transition from the instrument phase of an instrument approach to the visual landing phase.

INSTRUMENT APPROACHES UNDER POOR VISIBILITY

When flying a straight-in approach during clear visibility conditions, the pilot has almost unlimited peripheral visual cues available for depth perception, vertical positioning, and motion sensing. Even so, varying length and width of unfamiliar runways can lead to erroneous perceptions of aircraft height above the runway surface. A relatively wide runway may give the illusion that the aircraft is below a normal glidepath; conversely a relatively narrow runway may give the illusion of being high. With an awareness of these illusions under unlimited visibility conditions, it becomes easy to appreciate a pilot's problem in a landing situation in which the approach lights and runway lights are the only cues available.

Instrument approach lights do not provide adequate vertical guidance to the pilot during low visibility instrument approaches. In poor visibility, especially when the runway surface is not visible, there simply are not enough visual cues available to adequately determine vertical position or vertical motion. Studies have shown that when an aircraft is at or near approach minimums in conditions of limited visibility, the sudden appearance of runway lights often give a pilot the illusion of being high. They have also shown that when the approach lights become visible, pilots tend to abandon their orientation with electronic glidepath displays on their flight instruments and rely on the poor vertical cues that they see outside. Another similar situation occurs when a pilot flies into ground fog from above. If he initially sees the runway/approach lights, these cues will tend to disappear as he enters the fog bank. The loss of these visual cues will often induce the illusion or sensation of climbing. These situations of erroneous visual cues, convincing the pilot that the aircraft is above normal glidepath, generally result in a pushover reaction, an increase in the rate of descent, and a short or hard landing.

During periods of limited visibility, approach lighting is usually acquired when the aircraft is in close proximity to the ground or controlling obstacles. Under these conditions, an increase in the rate of descent may create a situation in which sufficient lift cannot be generated to break the rate of descent when the pilot realizes that the landing will not be at a desired point.

A primary method to prevent dangerously high rates of descent and short or hard landings is to maintain continuous crosscheck to an electronic glidepath and to the velocity indicator. The pilot should establish pre-determined limitations on maximum rate of descent for his aircraft that he will accept when landing out of a low visibility approach. Exceeding these limits during the transition to landing should result in a go-around and missed approach in the interest of aircraft and aircrew safety. Knowing that visual cues can be extremely erroneous, the pilot must continue to crosscheck instruments even after runway and/or approach lights have come into view. Most pilots find it extremely difficult to continue to crosscheck their flight instruments once the transition to the visual segment has been made, as their natural tendency is to believe the accuracy of their visual cues. In order to successfully continue reference VVI and/or GSI when approach lights come into view, a scan for outside references should be incorporated into the crosscheck at an early stage of the approach, even though restrictions to visibility may preclude the pilot from seeing any visual cues. If such a scan is developed into the crosscheck, it will facilitate the recheck of flight instruments for reassurances of glidepath orientation, once visual cues come into view and the visual transition is begun.

Further explanation of transitioning to the visual phase from the instrument phase of flight is explained and examined in AFM 51-37, paragraph 6-19. Most of the information in this article was contributed by Capt Rick Martin, ATC/DOTO, Randolph AFB, TX. ★

Mail & Miscellaneous

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

SAR PROCEDURES

In reference to your article in the Sept issue of *Aerospace Safety* titled "MAYDAY, MAYDAY—I'm Going To Ditch," I find it very difficult to understand why the SAR frogman punctured the life raft and life vest prior to pilot pickup. This is not taught at water survival school, and is highly frowned upon. According to the article, it was done to prevent either item from being sucked into the helicopter's rotors. This action should not occur as the rotors of a helicopter cause a down wash effect, blowing the life preserver units away from the chopper! It will not suck them up into the chopper. If this were to occur again, and in the process of pickup the helicopter were to experience trouble and go down, you would now have a man in the water, with no survival equipment. As a C-141 pilot, I transit the North Atlantic many times a month, and although we have never had to ditch, there could come a time when it might happen. I would hate to think that SAR would puncture our life rafts and preservers prior to pickup. The crew would be cold, wet, and tired, making it almost impossible to stay afloat without life support equipment. Had that Cessna pilot been in the water a while, exposure might have made him incapable of swimming and the frogman (although highly trained) would have had a difficult, if not impossible time, keeping the man afloat while trying to attach a horse collar. As it was the pilot swallowed a large amount of sea water. I recommend, if at all possible, a change to the article, or a change to SAR procedures, before an unnecessary tragedy occurs.

MICHAEL D. VARGO, Capt, USAF
Chief of Safety
18th Military Airlift Squadron
McGuire AFB, NJ

A check with our ARRS folks and the Navy Safety Center was made in regard to this article. Both organizations indicate that puncturing of the life preserver is neither taught nor recommended–Ed.

WEATHER CAUSES MOST GO-AROUNDS

Pilots recently queried by ALPA on the reasons for missed approaches under Category II and III weather conditions said poor visibility and other weather-related problems cause more go-arounds than any other factor.

Participants in the survey—all captains who fly Cat II and III approaches—said lack of visual cues is the chief cause of go-arounds, followed closely by unfavorable winds, turbulence and other weather hazards. The next most common reason is problems with cockpit equipment (malfunction in autopilot, flight director, etc.), followed by errors in air traffic control (bad vector, inadequate spacing, etc.) and problems with landing aids.

Altogether, the survey covered 72 missed approaches, almost 60% of which occurred below 200 feet. Of those, 39 (or 54% of the 72) occurred at 150 feet or lower while 31 (or 43%) occurred at 100 feet or lower.

In 58 cases, the pilot attempted a second approach, while in eight cases he diverted to another airport and in six he did not indicate (on the survey) what he did. Most of the second attempts (53) were successful.

Beginning last year, the Federal Aviation Administration (FAA) polled airport control towers on missed approaches during Cat II and Cat III operations, to determine how many go-arounds were pilot-initiated. During a seven-month period (September 1977-March 1978), FAA logged a total of 2,866 approaches (both general aviation and air carrier), of which 247 (about 9%) were not completed. These included misses initiated at the outer marker, Part 91 operators conducting look-see and other situations where the pilot elected to go around. . . .—Courtesy *Air Line Pilot*, Oct 78. ★

ANSWERS to First Aid and Survival Self-test from Page 5.

1. 12-16 per minute.
2. 72/min.
3. With ease, about 1 minute.
4. One inflation-deflation; five compressions.
5. If without radios, signal devices or mirrors, build a fire (or triangulate three fires), construct an SOS sign or other signal with ground shadow, foliage, or snow.
6. When unequipped, use your hands or fingers.
7. Slow rate to around 12-16 as determined in question 1.
8. Involuntary muscular contractions, or twitching.
9. Try your stability in various positions with eyes open and closed. You will find standing on one foot more difficult when your eyes are closed. Flight conditions without full use of vision are thus predisposing to spatial disorientation.
10. **None** has been equated to absolute doses. A good rule is to **avoid** junk foods (high in preservatives, artificial color and flavor), animal fat, etc. Based on the amount of your physical activity, you should balance caloric needs with high nutrition natural foods which include trace elements and adequate fiber.

EXTRA CREDIT:

Questions 2 and 3 relate as good indicators. For example, take your pulse at rest. If it is above 80 it means that your heart muscle needs more exercise. A minimum of 30 minutes of brisk walking daily is considered necessary to maintain the heart in good condition. If after one deep breath you cannot hold your breath easily for one minute, you probably need further tests for possible emphysema, overweight, or heart problems.

SCORING:

Give yourself 1 to 11 points for each reasonably correct answer. If you scored 11-10 points, you either already knew the information, or you took the time to figure out the answers! If you scored 8 or less, it means that you either didn't have a watch or clock within view, or were too lazy or impatient to figure out the answers. ★

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.

CAPTAIN
Edward B. Williston

CAPTAIN
John M. Nadolski

363d Tactical Reconnaissance Wing
Shaw Air Force Base, South Carolina

On 14 April 1978, Captains Williston and Nadolski were in the final portion of an instructor upgrade check flight. Captain Nadolski, in the rear cockpit of the RF-4C aircraft, had just completed a no-flap touch-and-go landing. As the aircraft broke ground there was a muffled explosion followed by a fire light on the left engine. The runway supervisory officer and the tower controllers radioed that the aircraft was on fire. Flames were streaming approximately 30 feet behind the aircraft. Captain Williston took control and requested a closed pattern as he selected afterburner on the right engine and idle on the left engine. Captain Nadolski confirmed fire coming from the left rear. The fire and fire lights persisted until Captain Williston shut the engine down. After shutdown the fire light went out, but as the aircraft gained closed downwind altitude the fire light came back on and the utility hydraulic pressure failed. Captain Nadolski could see smoke coming from the left side of the aircraft. Because they were so close to the field, they decided to set themselves up for landing with a single engine failure and utility hydraulic failure. Both crew members were required to hold full right rudder and nearly full right aileron to keep the aircraft from rolling inverted on final approach. Final approach was flown at 230 KIAS with touchdown planned at 191 KIAS. After touchdown both main tires blew, but the aircraft was kept on the runway by nose wheel steering and a departure end cable engagement was made at approximately 120 KIAS. After the aircraft stopped, tower radioed that there was fire around the right wheel. The crew members made an emergency egress. The source of the first fire and explosion was the failure of a "V" band coupling which connects the aircraft fuel system to the engine fuel system. When this coupling failed, raw fuel was dumped into the engine bay and onto the hot engine. The second fire and the utility hydraulic failure were caused by the burning of the auxiliary air door utility hydraulic line. This caused failure of the line and burning of hydraulic fluid in the left engine bay. The superb skill and excellent control exhibited by Captains Williston and Nadolski and their timely and decisive actions during this critical and potentially disastrous phase of flight prevented possible loss of life and resulted in the recovery of a valuable aircraft. WELL DONE! ★

OPS TOPICS

A FLICK OF SOMEONE'S BIC

An F-5E on takeoff roll was aborted on the runway when the left engine compressor stalled after the pilot selected afterburner. The aircraft was taxied clear of the runway and shut down. During local maintenance teardown, extensive FOD to the left engine compressor was discovered.

The FOD investigation team discovered tiny blue specks of what appeared to be melted plastic in the aft engine section. They were able to match the damage to the compressor blades to pieces of a disassembled "BIC" type disposable lighter. Further inspection of the inlet guide vanes (IGV) section indicated that the lighter was sitting between the IGVs and the first stage compressor blades at the time of the first engine rotation at engine start. With the lighter in this position, a pilot conducting his preflight would not detect it, and discovery would be extremely difficult by the plane captain during his preflight inspection.

The pilot did not carry a cigarette lighter and the plane captain emptied his pockets and was properly attired in appropriate clothing for the intake inspection.

The position of the lighter at initial engine rotation makes it highly improbable that it was dropped inadvertently into the intake by maintenance personnel. Two possibilities were mentioned that might account for the lighter's presence in the intake, although both were considered unlikely possibilities.

- It was blown from the ramp by a taxiing aircraft and went into the intake.
- It had been lost in the cockpit on a previous flight and had been ingested into the intake after landing when the canopy was opened.

Cost of this mishap amounted to $14,308 – an expensive "flick of the BIC." – Courtesy US Naval Safety Center *Weekly Summary*.

HARD TO BELIEVE

The pilot was preflighting the aircraft in preparation for an 0730 LCL departure. He squatted down to inspect the nose gear and used the propeller to help himself up. The magneto switch was on in the both position. The engine fired, causing the propeller to strike the pilot on the left side of his head. He survived, but we imagine the prop won't be the same.

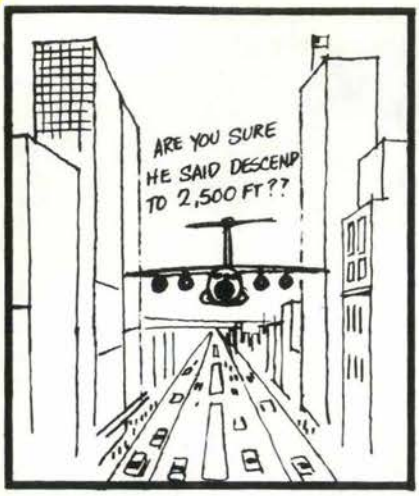
THEY'RE STILL DOING IT!

A CT-39 had been cleared for takeoff and had commenced takeoff roll when a vehicle was observed, by the tower, passing the hold line and runway crossing lights at the main intersection of runway 12 and the closed runway 21. The aircraft was advised of the vehicle and takeoff clearance cancelled. The pilot immediately started braking and came to a stop approximately 300 feet before the main intersection. The vehicle driver apparently saw the aircraft and came to an abrupt stop. Another good reminder that "cleared for takeoff" may not mean the concrete's empty.

SAY IT LIKE IT IS

Poor communication because of non-precise terminology has been a factor in many aviation mishaps. For the air traffic control system to function with any efficiency, each involved person must clearly understand others with whom he is in contact. Hence, standard terminology and the need for each pilot and controller to know the right words. There was some confusion when a pilot declared an emergency with an ARTCC for low fuel. He did not specify "emergency fuel." When the message got to the destination tower, it came on as minimum fuel. Meanwhile, there was some confusion between the Center, Approach Control and the tower as to the aircraft's location and the pilot's intentions. Twice the pilot told Center he wanted runway 25 for a straight-in, but the tower never got the message. Approach attempted to take the aircraft in on 25 for a vector to landing on 07. The pilot, meanwhile, kept saying he intended to land on 25. Meanwhile, another landing aircraft was involved. It landed on 25 and cleared at an intersection. However, the emergency aircraft by then had already initiated a go-around. This one turned out okay, other events of this sort haven't. To make a good team, pilots and controllers must speak the same language.

OPS TOPICS



LISTEN TO HEAR

The incident above illustrates one of the hazards of poor ATC–pilot communication. The following item is about the same kind of problem with slightly different circumstances. The pilot misunderstood a clearance to descend to 3,500 ft and repeated 2,500 several times. The Approach controller did not detect the mistake and, when the aircraft had descended to 2,500, transferred the aircraft to the PAR final controller. He requested the aircraft's altitude, received 2,500 ft, and immediately directed a climb to 3,500 and a 90° turn. Apparently someone wasn't listening. Similar mistakes have put aircraft into mountains, the sea and other unpleasant places for airplanes. Listen for your life.

THAT'S SHOW BIZ

Three days after a KC-135 had been on static display, it lost the emergency depressurization door on takeoff. The aircraft would not pressurize; the boomer checked and found the door missing. The safety wire on the recessed handle location on the pilot's panel had been broken, which was not noticed because it is not a checklist item and some aircraft don't have the wire. The unit has submitted an AFTO 22. We pass this item along because of the distinct possibility that one of the 50 or so folks who toured the aircraft pulled and replaced the emergency depressurization handle. This and similar incidents in the past indicate the wisdom of a very careful check after an aircraft has been on display.

80 OCTANE IS RED, 100 LOW LEAD IS PALE BLUE

There is no requirement, other than good sense, for aero club managers to label their fuel pumps as to the type of gasoline they dispense. Clubs are, after all, serving only their own aircraft and their own people, right? WRONG! TDY and personal travel to other bases is becoming common at several clubs. During a TDY to a midwestern base, an arriving aero club transient failed to note the color of the fuel from the unmarked pump until about two gallons had been dispensed. Defueling was completed and the potentially serious consequences avoided, but the lesson for aero club managers and fliers alike should be clear–know what you are putting into the tank. 80 octane fuel, sold by several clubs for their own aircraft, is not usable in many modern light aircraft. If your club sells it, be sure your transient trade knows what they are getting.–Capt Conrad A. Chapelle, AU, Maxwell AFB, AL.

REPLACEMENT FOR AGEING TRAINER EYED

WASHINGTON (AFNS)–Air Force is studying a new trainer aircraft to replace the 23-year-old T-37 if modifications to update that aircraft prove too expensive.

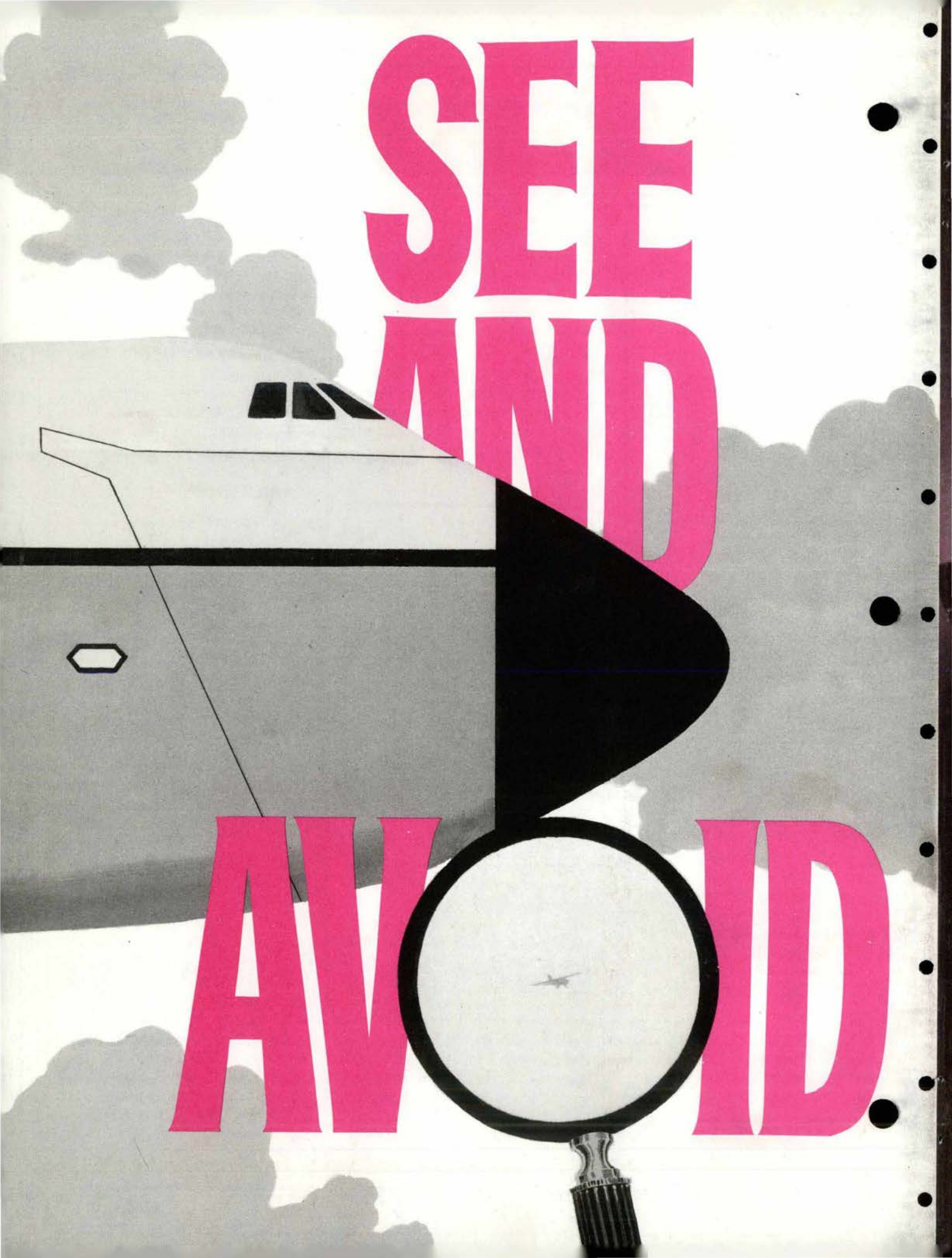
The "Trainer'X" or next generation trainer aircraft is to be developed for primary undergraduate pilot training conducted by Air Training Command (ATC).

Requests for proposals are expected to be issued to both engine and aircraft manufacturers for the design competition in the spring of 1979, officials said.

ANOTHER CLOSE ONE!

Reviewed approach control tapes. Air traffic intensity was moderate; controller workload was moderate. The controller stated that she would have provided the military aircraft an advisory on a VFR target but that another aircraft was busting its altitude at the same time and she had to work that problem first. *Both aircraft were flying within the legal constraints of the Federal Aviation regulations and Air Force regulations.* A probable midair collision was avoided via use of the "see and avoid" concept. ★

☆U.S. Government Printing Office: 1979—683-011/4


SEE
AND
AVOID